



LATHAN • McKEE
ARCHITECTS

Project Manual

**Site Improvements and Interior
Alterations
to
Fairhope High School
for the
Baldwin County Public Schools
Fairhope, Alabama
MCKEE PROJECT NO.25-160B
March 25, 2026**

Alabama Division of Construction Management No.

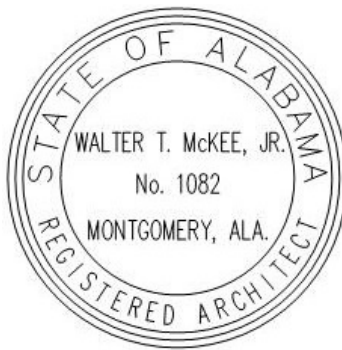


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to

Fairhope High School

for the

Baldwin County Board of Education

Fairhope, Alabama

MCKEE PROJECT NO. 25-160B

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ADVERTISEMENT FOR BIDS

SITE IMPROVEMENTS AND INTERIOR ALTERATIONS TO FAIRHOPE HIGH SCHOOL FOR THE BALDWIN COUNTY BOARD OF EDUCATION FAIRHOPE, ALABAMA

MCKEE PROJECT NO. 25-160B

Pre-qualification proposals will be received at the office of Lathan McKee Architects, 631 South Hull Street, Montgomery, AL 36104, until **10:00 AM Central Time, Thursday, April 9, 2026**. Forms should be emailed to **mckeeplans@gmail.com**.

Requirements for Pre-qualification: All potential General Contractors who desire to bid shall contact the Architect at **mckeeplans@gmail.com** to receive the criteria to be used for the pre-qualification of this project (AIA Document A305 and Questionnaire).

Sealed proposals for this project shall be received by Mrs. Marlana Hanner, Purchasing Supervisor, Baldwin County Board of Education, 23651 Flowers Road, Robertsdale, AL 26567 | 251-947-8403, **until 2:00 PM Central Time, Tuesday, April 21, 2026**, then opened and read aloud.

A Non-Mandatory Pre-Bid Conference shall be held on **Tuesday, April 14, 2026, at 10:00 AM Central Time** at the school.

All General Contractors bidding on this project shall be required to visit the site and examine all existing conditions prior to submitting their proposal.

All Bidders shall have general liability and workman's compensation insurance. The project shall be bid excluding taxes. Bids must be submitted on proposal forms furnished by the Architect or copies thereof. No bid may be withdrawn after scheduled closing for receipt of bids for a period of ninety (90) days. The Owner reserves the right to reject any or all proposals and to waive technical errors if, in the Owners judgment, the best interests of the Owner will thereby be promoted.

A certified check or Bid Bond payable to **Baldwin County Board of Education** in an amount not less than five percent (5%) of the amount of the bid, but in no event more than \$10,000.00 must accompany the bidder's sealed proposal. Performance and statutory labor and material payment bonds will be required at the signing of the Contract.

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. All bidders shall show such evidence by clearly displaying their current license number on the outside of their sealed envelope in which the proposal is delivered.

PDFs of the project can be reviewed by going to the McKee website at www.mckeeassoc.com and selecting "Project Bid List". Also, if you are not receiving NOTIFICATIONS from us, please register on our website, "Project Bid List" by selecting

manage your bid list profile. The documents may be viewed on-line and printed by General Contractors, Sub-Contractors and Suppliers. Documents published through this procedure are the only documents endorsed by the Architect. The Architect is unable to monitor, confirm and maintain other websites that provide documents. Addendums will be provided to entities that have *CONFIRMED* bidding for this particular project. The Architect retains ownership and copyrights of the documents. If bidders require printed sets, please submit request to the Architect at mckeeplans@gmail.com. Include your first & last name, company name, address, phone number and the McKee project name and number. *Print sets are to be returned in re-usable condition within ten days after bid opening.*

All RFIs and RFAs regarding the bid documents shall be sent and addressed through emails found on the RFI and RFA forms in the project manual. **NOTE: ONLY THE RFI AND RFA FORMS IN THE PROJECT MANUAL WILL BE ACCEPTED.** The Architect will not accept inquiries via telephone or fax.

Completion Time: See scope of work in Project Manual.

Supervision: Contractor to ensure proper supervision of all work.

Owner: Mr. Carl E. Tyler, Superintendent, Baldwin County Board of Education; 2600-A North Hand Avenue, Bay Minette, Alabama 36507, Phone: (251) 937-0306

Architect: Lathan McKee Architects, 631 South Hull Street, Montgomery, Alabama 36104, Phone: (334) 834-9933

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1. BID DOCUMENTS:

The Bid Documents consist of the Advertisement for Bids, these Instructions to Bidders, any 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.
- e. **Procedures for "Pre-bid Approval".** If it is desired that a product, material, system, 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 should 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 **and date** 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:

a. 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.

b. A list of all proposed major subcontractors and suppliers will be submitted by Bidders to the Architect 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. If the list includes a fire alarm contractor and/or fire sprinkler contractor, Bidders will also submit a copy of the fire alarm contractor’s and/or fire sprinkler contractor’s permits from the State of Alabama Fire Marshal’s Office.

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) **Timely Notice:** 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) **Substantial Mistake:** The mistake must be of such significance as to render the bid price substantially out of proportion to the other bid prices.

(3) **Type of Mistake:** 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) Documentary Evidence: 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 re-advertisement 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 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.

REQUEST FOR INFORMATION

(RFI)

Email this form in its entirety to Project Manager listed below.

The Architect reserves the right not to answer any Request For Information received after 2:00 p.m., Two (2) days prior to the bid date.

To: Lathan McKee, Architects
Victor Hunt, Project Manager
vhunt@lathanmckee.com
Email

Kristie Dieguez, Architect
kristie@kddarch.com
Email

From: _____
Name

Company

Email

Project Number: _____

Issue Date: _____

Project: _____

Request For Information Number: _____

☐ BID PHASE

☐ CONSTRUCTION PHASE

Procedures for "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 or can be accessed by going to the McKee web site - mckeeassoc.com and clicking on the tab "Files" to retrieve the Addendums. Neither the Architect nor the Owner 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.

REQUEST FOR INFORMATION DESCRIPTION: (Fully describe the question or type of information requested.)

REFERENCES/ATTACHEMENTS: (List specific documents researched when seeking the information requested.)

Specification Title: _____

Description: _____

Section: _____ Page: _____
Site Improvements and Interior Alterations to
Foley High School for the
Baldwin County Public Schools
Fairhope, Alabama

Article/Paragraph: _____

REQUEST FOR INFORMATION (RFI)
0000- 1

Drawing Sheet Number: _____ Title: _____

Plan: _____ Elevation: _____ Section: _____ Detail: _____

Other:

RECEIVERS REPLY:

Signed by: _____ Date: _____ Copies to: _____

Site Improvements and Interior Alterations to
Foley High School for the
Baldwin County Public Schools
Fairhope, Alabama

REQUEST FOR INFORMATION (RFI)
0000- 2

MCKEE PROJECT NO. 25-160B

REQUEST FOR APPROVAL (RFA)

PRIOR APPROVAL/SUBSTITUTION REQUEST

Email this form in its entirety to Project Manager listed below.

All products, materials, systems, equipment and services requested for prior approval must be submitted to the architect for approval **no later than 2:00 p.m., Ten (10) days prior to the bid date.**

To: Lathan Mckee, Architects Substitution Request Number: _____
Victor Hunt; Project Manager From: _____
vhunt@lathanmckee.com Date: _____
Email
Kristie Dieguez; Architect A/E Project Number: _____
kristie@kddarch.com Contract For: _____
Email

Project: _____

Re: _____

Specification Title: _____ Description: _____
Section: _____ Page: _____ Article/Paragraph: _____

Procedures for “Substitutions” and “Pre-Bid Approval”:

- 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.
- e. **Procedures for “Pre-Bid Approval”.** If it is desired that a product, material, system, 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**

Site Improvements and Interior Alterations to
Foley High School for the
Baldwin County Public Schools
Fairhope, Alabama

PRIOR APPROVAL / SUBSTITUTION REQUEST FORM
0000-1

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.

The undersigned requests consideration of the following product substitution:

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

Supporting Data Attached: ☐ Product Description ☐ Drawings ☐ Photographs ☐ Performance & Test Data ☐ Specifications

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned states and certifies the following: (Mark Boxes as Applicable)

- ☐ Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
or
- ☐ Proposed substitution differs from what is specified in the Bid Documents. Submitted Data clearly identifies all differences from what is specified in the Bid Documents.
- ☐ No changes will be required to the Contract Documents for the proper installation of the proposed product substitution.
or
- ☐ Changes will be required to the Contract Documents for the proper installation of the proposed product substitution. Submitted Data clearly identifies description of changes.
- and*
- ☐ Warranty will be furnished for proposed substitution ☐ Equal to or ☐ Superior to specified product.
- ☐ Proposed substitution does not affect dimensions shown on the drawings and functional clearances.
- ☐ No changes will be required to the building design, engineering design or detailing by the proposed substitution.
- ☐ Proposed substitution will have no adverse effect on other trades and will not affect or delay construction progress schedule.
- ☐ No maintenance is required by the proposed substitution other than that required for originally specified product.
- ☐ Other Information:

The undersigned further states that they have read the corresponding specification sections in the project manual and confirms that the function, appearance and quality of the proposed substitution are equivalent to or superior to the originally specified product.

Submitted by: (Print)

Signature:

Date:

Firm:

Address:

Email:

Telephone:

A/E REVIEW AND ACTION

Site Improvements and Interior Alterations to
Foley High School for the
Baldwin County Public Schools
Fairhope, Alabama

PRIOR APPROVAL / SUBSTITUTION REQUEST FORM
0000-2

☐ Substitution Approved
☐ Substitution Request Received to Late

☐ Substitution Approved as noted

☐ Substitution Rejected

Comments:

Signed by:

Date:

PROPOSAL FORM

To: _____ Date: _____
(Awarding Authority)

In compliance with the Advertisement for Bids and subject to all the conditions thereof, the undersigned

(Legal Name of Bidder)

hereby proposes to furnish all labor and materials and perform all work required for the 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 the State of _____,
having its principal offices in the City of _____,
is: ☐ a Corporation ☐ a Partnership ☐ an Individual ☐ (other) _____.

LISTING OF PARTNERS OR OFFICERS: If Bidder is a Partnership, list all partners and their
addresses; if Bidder is a Corporation, list the names, titles, and business addresses of its officers:

BIDDER'S REPRESENTATION: The Bidder declares that it has examined the site of the Work,
having become fully informed regarding all pertinent conditions, and that it has examined the Drawings
and Specifications (including all Addenda received) for the Work and the other Bid and Contract
Documents relative thereto, and that it has satisfied itself relative to the Work to be performed.

ADDENDA: The Bidder acknowledges receipt of Addenda Nos. _____ through _____ inclusively.

BASE BID: For construction complete as shown and specified, the sum of _____
Dollars (\$ _____)

ALTERNATES: If alternates as set forth in the Bid Documents are accepted, the following adjustments
are to be made to the Base Bid:

For Alternate No. 1 (.....) ☐ (add) ☐ (deduct) \$ _____
(Insert key word for Alternate)

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 - (Attach to this Proposal Form the unit prices, if any, on a separate sheet.)

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 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 & Title (print)** _____ (Seal)

Telephone Number _____

Email Address _____

* 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.

ACCOUNTING OF SALES TAX

Attachment to DCM Form C-3: Proposal Form

To: _____ 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:

ESTIMATED SALES TAX AMOUNT

BASE BID: \$ _____

Alternate No. 1 (.....) ☐ (add) ☐ (deduct) \$ _____
(Insert key word for Alternate)

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) \$ _____

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.

BID BOND

The **PRINCIPAL** (*Bidder's company name and address*)

Name:

Address:

The **SURETY** (*Company name and primary place of business*)

Name:

Address:

The **OWNER** (*Entity 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 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

SPECIAL INSTRUCTIONS TO BIDDERS

1.1 INTENT OF INSTRUCTIONS

- A. The Special Instructions to Bidders are intended to amplify the abbreviated Advertisement and to give other details which shall allow interested parties to prepare bids which accurately reflect the scope of the Work. The Special Instructions to Bidders are meant to be viewed as a complement to the general Instructions to Bidders found in the Project Manual. Should any discrepancy or ambiguity be noted, the Special Instructions to Bidders shall defer to the general Instructions to Bidders.

1.2 EXPLANATION AND INTERPRETATION

- A. Should any Bidder or subcontractor find any ambiguity, discrepancy, omission, or error in the Drawings and Project Manual, or insufficient information to provide a complete job, or be in doubt as to the intent and meaning thereof, he should at once report such in writing to Architect and request clarification prior to bidding.
- B. Clarification shall be made only by written Addenda during the bid period and sent to all perspective Bidders. The Architect and Consultants shall not be responsible for verbal answers regarding intent or meaning of the Contract Documents, or for any verbal instructions, by whomsoever made, prior to the award of the Contract.
- C. Additionally, all designed systems and/or assemblies are to be proposed and bid as complete assemblies or operational systems. Drawings are indicating intent and not attempting to fully obtain or detail required work.

1.3 BIDDER REQUIREMENTS

- A. **All Bidders must honor their bid proposals for a period of 90 calendar days from date of bid opening.**
- B. **The Contractor MUST Field Verify all existing conditions prior to submitting bid proposal.**
- C. **The Apparent Low Bidder AND Apparent Second Lowest Bidder** must submit to the Architect a direct Contact Name, Phone Number and Email Address for the Bonding Company and a list of the principal Subcontractors, suppliers, and fabricators he plans to use for each category of work. The list of Subcontractors, Suppliers and Fabricators must be received by the Architect within **24 hours following the Bid Opening** (email to: krawlinson@lathanmckee.com). Once the successful bidder has obtained approval from the Owner, no changes in Subcontractors, Suppliers or Fabricators shall be made without the express, written consent of the Owner. Contractor shall request consent in writing from the Owner and Architect and provide specific and reasonable explanation as to the necessity of said change. Should said change be approved by the Owner, the Contractor must submit the desired replacement Subcontractor to the Architect and obtain written approval of the Subcontractor.

1.4 OPENING OF PROPOSALS

- A. The Owner shall, according to applicable laws and regulations pertaining to bid openings, receive and review all Proposals submitted, according to the method selected below:
 - 1. Proposals shall be opened and read publicly at the time and place indicated in the Advertisement.
 - 2. Proposals may be rejected if they contain any omissions, alterations of forms, additions not called for, conditional bids, alternate bids unless called for, incomplete bids, erasures, or irregularities of any kind. Proposals in which the unit or lump sum prices bid are obviously unbalanced may be rejected. Additions to or deductions from the Bid amount may be written on the outside of the sealed bid, or by letter enclosed in the sealed bid envelope.

1.5 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 additional funds become available after the bid opening, the Owner may at his option elect to award to the lowest base bid bidder a contract based on the Contractors base bid amount and additional Alternates.**
- D. 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.
- E. 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.
- F. 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.

1.6 AWARD OF CONTRACT

- A. The Bidder to whom the award is made shall be notified by letter to the address shown on his Proposal at the earliest possible date. At such time, at the option of the Owner, additional information such as a complete financial statement may be required from the successful Bidder.

1.7 EXECUTION OF CONTRACT

- A. The Contract shall be signed by the successful Bidder, in the number of counterparts provided in the Contract Agreement and returned to the Owner with satisfactory Contract Bonds within ten (10) days after the date of Notice of Award.

1.8 PERFORMANCE BOND AND PAYMENT BOND

- A. The intent of the Performance Bond is to ensure the faithful performance of each and every condition, stipulation, and requirements of the Contract and to indemnify and save harmless the Owner, Architect, and Consultants from any and all damages, either directly or indirectly (arising out of any failure to perform same). The successful Bidder to whom the Contract is awarded shall furnish at his expense an acceptable Performance Bond in an amount equal to one hundred percent (100%) of the Contract Price of the Contract as awarded. Said Bond shall be made on the approved Bond form, shall be furnished by a surety company duly authorized and qualified to make such bonds in the State of Alabama, shall be countersigned by an authorized agent resident in the State who is qualified for the execution of such instruments, and shall have attached thereto power of attorney of the signing official. In case of default on the part of the Contractor, all expenses incident to ascertaining and collecting losses suffered by the Owner under the Bond, the direct costs of administration, architectural, engineering, and legal services, shall lie against the Contract Bond for Performance of the Work.
- B. In addition thereto, the successful Bidder to whom the Contract is awarded shall furnish at his expense a Payment Bond with good and sufficient surety payable to the Owner in an amount not less than one hundred percent (100%) of the Contract Price, with the obligation that the Contractor shall promptly make payment to all persons furnishing him or them with labor, material, feedstuffs, or supplies for or in prosecution of the Work provided for in the Contract and for the payment or reasonable attorneys' fees, incurred by successful claimants or plaintiffs in suits on said Bond.

- C. **The Apparent Low Bidder AND Apparent Second Lowest Bidder** must submit to the Architect a direct Contact Name, Phone Number and Email Address for the Bonding Company within 24 hours of the bid opening.

1.9 APPROVAL OF CONTRACT

- A. No Contract is binding upon the Owner until it has been executed by the Owner and the successful Bidder and copies delivered.

1.10 CAD FILES

- A. McKee & Associates CAD Files shall not be provided. Should the contractor require CAD Files they are encouraged to seek online PDF to CAD File Conversion vendors and/or software.

1.11 LIST OF SUBCONTRACTORS

- A. **The Apparent Low Bidder AND Apparent Second Lowest Bidder** must submit to the Architect a direct Contact Name, Phone Number and Email Address for the Bonding Company and a list of the principal Subcontractors, suppliers, and fabricators he plans to use for each category of work must be received by the Architect within twenty-four hours following the Bid Opening. Email to krawlinson@lathanmckee.com. Once the successful bidder has obtained approval from the Owner, no changes in Subcontractors, suppliers and fabricators shall be made without the express, written consent of the Owner.

1.12 LIST OF SUBCONTRACTORS SUBMITTAL FORM

Email this form in its entirety to contact listed below.

The **Apparent Low Bidder AND Apparent Second Lowest Bidder** must submit to the Architect a **direct Contact Name, Phone Number and Email Address for the Bonding Company** and the principal Subcontractors, suppliers, and fabricators he plans to use for each category of work. The list of Subcontractors must be received by the Architect within twenty-four hours following the Bid Opening.

To: Lathan Mckee, Architects

Kayla Rawlinson

krawlinson@lathanmckee.com

Email

From: _____

Company

Name

Email

Project Name: _____

Phone Number

Project Number: _____

Issue Date: _____

Bid Date: _____

Category of Work	Name of Sub to Perform Work	Name of Supplier
SURETY		

END OF SECTION

Site Improvements and Interior Alterations to
Foley High School for the
Baldwin County Public Schools
Fairhope, Alabama

SPECIAL INSTRUCTIONS TO BIDDERS
PAGE-4

**PREPARATION AND APPROVAL OF
CONSTRUCTION
CONTRACTS and BONDS
SUBMITTED ELECTRONICALLY**

CHECKLIST

Use with DCM Forms C-5, C-6, & C-7
and DCM Forms 9-A, 9-B, & 9-C

CONSTRUCTION CONTRACT - DCM Form C-5 or DCM Form 9-A (PSCA Projects)	
The numbers in the left column below correspond to numbers in the left margin of the Contract form.	
(1)	PROJECT NUMBER(S): DCM will insert the DCM Project Number in the field provided. On DCM Form 9-A, insert the PSCA Project Number in the field provided.
(2)	DATE: Do not select a date beyond today's date.
(3)	OWNER: Insert the full, legal name, address, email, and telephone number of the Owner (Awarding Authority). On DCM Form 9-A, insert the name, address, email, and telephone number of the Local Owner (city or county school board, college, university, etc.) after "Alabama Public School and College Authority"
(4)	CONTRACTOR: Insert the Contractor's company name, correct mailing address, email, and telephone number. For State Agency projects, the Contractor Company name and address must match the name and address registered in the State of Alabama Accounting and Resource System (STAARS) or AL Buys (if registered), used by most State Agencies to pay Vendors. The Contractor Company name and address must be consistent across all documents in the same contract package, in order to avoid Comptroller's Office rejection. On DCM Form 9-A: The Contractor Company name and address must match the name and address registered in STAARS or AL Buys used by the State to pay Vendors. The Contractor Company name and address must be consistent across all documents in the same contract package, in order to avoid Comptroller's rejection.
(5)	The WORK: Insert the complete name of the Project; same as in the Bid Documents.
(6)	CONTRACT DOCUMENTS: Insert the date of the Bid Documents
(7)	ADDENDA: Identify, by number and date, all pre-bid Addenda that were issued to the Bid Documents. If none were issued, insert "None". All Addenda shall be submitted to DCM for review prior to contract issuance.
(8)	ARCHITECT: Insert the full, legal name, address, email, and telephone number of the Project Architectural or Engineering firm.
(9)	CONTRACT SUM: The Contract Sum is the total of the Contract's Base Bid and accepted Bid Alternate Prices, if any. Insert the Contract Sum in words and figures, verifying that this amount corresponds with the CERTIFIED TABULATION OF BIDS.
(10)	BID ALTERNATE PRICES: Identify which, if any, Bid Alternate Prices are accepted and included in the Contract Sum by inserting either (a) "No Alternate Prices Requested in Bid", (b) "No Alternate Prices Accepted", or (c) a listing of the accepted Alternates by number and dollar amount.
(11)	The CONTRACT TIME: State the Contract Time in words and in figures.
(12)	LIQUIDATED DAMAGES: If the Owner has computed a daily rate for liquidated damages, insert the amount in both words and figures in the spaces provided.
(13)	SPECIAL PROVISIONS: This space may be used to incorporate Special Provisions into the Contract, such as unit prices, compliance with enacted provisions, and value engineering. If the solicitation for bids required Unit Prices, insert a statement of which Unit Prices, if any, are accepted and incorporated into the Contract. If more space is needed, Special Provisions may be stated on an attachment that is cited in the Special Provisions section. DCM Form 9-A is published bearing Special Provision "A. Severable Payments", which is where the portions of the Contract Sum to be paid by the PSCA and the Local Owner are to be stated. Obtain these amounts from Local Owner and insert them in the spaces provided. Other Special Provisions, such as disposition of Unit Prices, may be inserted below this provision.
(14)	STATE GENERAL CONTRACTOR'S LICENSE: Insert the Contractor's current state general contracting license number, bid limit, and classification in the spaces provided.

(15)	SIGNATURES - APPROVING and CONTRACTING PARTIES The documents will forward to the signers in sequential order.
PERFORMANCE BOND, DCM Form C-6 or DCM Form 9-B (PSCA Projects), and PAYMENT BOND, DCM Form C-7 or DCM Form 9-C (PSCA Projects) Required for contracts of \$100,000.0 or more, with surety's power-of-attorney - required per Section 39-2-8 of the Code of Alabama.	
(1)	SURETY'S BOND NUMBER should be inserted in the field provided.
(2)	PRINCIPAL: Contractor's name and address is to be the same as appears in the Construction Contract.
(3)	SURETY: The full, legal name and address of the bonding company.
(4)	OWNER: The Owner's name and address is to be the same as appears in the Construction Contract.
(5)	PENAL SUM: The Penal Sum of each Bond is to be the Contract Sum of the Construction Contract and is to be inserted in both words and figures.
(6)	The Date of the Construction Contract: The date that appears on the Construction Contract.
(7)	The PROJECT: The same name or description as appears in the Construction Contract.
(8)	DATE: After "SIGNED AND SEALED" is to appear the date upon which Surety signs the Bond. THIS DATE CANNOT PRECEDE THE DATE OF THE CONSTRUCTION CONTRACT.
(9)	CONTRACTOR'S SIGNATURE: The Contractor's name must appear beneath "CONTRACTOR", under which the signature of a member or officer of the firm must appear with the name and title of the signing party appearing beneath the signature.
(10)	SURETY'S SIGNATURE: The full, legal name of the bonding company must appear under "SURETY", under which the signature of an individual having power of attorney for the bonding company must appear with the individual's name and title appearing beneath the signature.
(11)	ATTACHED POWER OF ATTORNEY: Attached to each of the Bonds must be a Power of Attorney, signed by an officer of the bonding company, for the individual e-signing the bond on behalf of the bonding company. The date of the Power of Attorney <u>must</u> not precede the date of the bond.
ATTACHMENTS The following documents must be attached to the Construction Contract: - Insurance Certificate (attach copy): It is the responsibility of the design professional to ensure all insurance requirements are discussed with bidders prior to a bid and that Contractor has provided the requirements to their insurance provider. Contractor must obtain <u>all</u> insurance coverage specified in Article 37 of the General Conditions of the Contract - required per Section 39-2-8 of the Code of Alabama. - Surety's power-of-attorney: Required for Performance Bond, which is required for contracts of \$100,000.00 or more per Section 39-2-8 of the Code of Alabama. - Surety's power-of-attorney: Required for Payment Bond, which is required for contracts of \$100,000.00 or more per Section 39-2-8 of the Code of Alabama. - Certified Tabulation of Bids (attach copy): Required for all projects including those with informal bids -required per Section 39-2-6 of the Code of Alabama. - DCM Form C-3: Proposal Form (attach copy): If bid proposal was adjusted by notation on outside of envelope, also attach copy of outside of envelope including notation. - DCM Form C-3A: Accounting of Sales Tax (attach copy): Attachment must be of the executed C-3A from the bid -required per Section 40-9-14.1 of the Code of Alabama. - E-Verify Memorandum of Understanding (attach copy): Entire document required - required per Section 31-13-25(b) of the Code of Alabama. - Alabama Vendor Disclosure Statement - required per Section 41-16-82 of the Code of Alabama. Contractor must mail one original completed wet-signed notarized and dated hardcopy to DCM along with DCM Form: Transmittal of Alabama Vendor Disclosure Statement. DCM will perform a review, and if the document is correct, will attach a scan of the Disclosure Statement to the Contract.	

DCM USER FEES:

- **PSCA-Funded Projects & Fully Locally-Funded State Agency Projects:** The Contract Document Administration Fee-CC and the Permit Fee must be paid by the time a Construction Contract for a PSCA-funded project or state agency/authority project is submitted to DCM for review, or when a fully locally-funded project Construction Contract is converted to PSCA. Contract reviews can begin once the fees have been paid.
- **Fully Locally-Funded K-12 Projects:** The Permit Fee must be paid by the time a copy of a fully locally-funded K-12 school project's executed Construction Contract is received at DCM's office from the State Department of Education (SDE). * See Permit Fee exception below.

- **General Information:**

Basic Contract Document Administration (CDA) Fee: This fee covers review of the Agreement Between Owner and Architect (O/A Agreement) and Construction Contract for state agency projects, and partially or fully PSCA-funded projects of K-12 public schools and universities and the related amendments, change orders, service invoices and pay requests. This fee does not apply to fully locally-funded K-12 public school projects or fully locally-funded university projects. The Basic CDA Fee covers review of the original submitted document and one revision. The total basic CDA fee is 1/2 of 1% of the total construction cost, due in two parts: 1/4 of 1% (.25%) of the Project Budget for administration of the O/ A Agreement. 1/4 of 1% (.25%) of the Construction Contract Amount for administration of the Construction Contract. The CDA Fee for a PSCA-funded O/A Agreement or Construction Contract is limited by the Project Construction Cost funded by PSCA.

Additional Revised Contract Document Fee: When more than one revision of a Construction Contract is required, an additional fee of \$200.00 will be charged to the design professional for each additional submittal until the document is executed.

Basic Permit Fee: This fee covers required project inspections. The Permit Fee **must be paid before a construction contract is reviewed by DCM, or** becomes due when a self-performance letter **or fully locally-funded K-12 construction contract** is received by DCM, and must be paid before a Pre-Construction Conference is scheduled with DCM Inspectors*

Note: Although DCM does not review the construction contracts of fully locally-funded public K-12 projects, the Permit Fee must be paid before the required Pre-Construction Conference is scheduled with DCM Inspectors for such projects.*

* Exception: Permit Fees are not owed for fully locally-funded public K-12 projects with an estimated cost of \$750,000.00 or Less for capital improvement or alterations, additions, repair, or maintenance of heating, ventilation, and air conditioning systems or any alterations, additions, repair, or maintenance of a roof; all such projects are still subject to DCM pre-construction conferences and inspections.

∇ Determination of whether or not a project is in the \$750,000.00 or Less classification for Permit Fees is based on the cost of the entire project including all phases and bid packages. If total of bids received for all phases and bid packages exceeds \$750,000.00 for a fully locally-funded public K-12 project, then a Permit Fee is owed.

Fees May Be Paid online at www.dcm.alabama.gov or paid with a physical check. Make check payable to: "Finance - Construction Management", include the DCM (BC) Project #, if assigned, on the check and attach the CDA Fees Calculation Worksheet and/or the Permit Fees Calculation Worksheet (also available on www.dcm.alabama.gov). Mail payment to: Finance - Construction Management, P.O. Box 301150, Montgomery, AL 36130-1150. For payments using Public School and College Authority (PSCA) funds and for state agency inter-fund transfers: contact Jennie Jones at 334-242-4808 or jennie.jones@realproperty.alabama.gov.

This form is provided solely for the purpose of inclusion in the project manual. A Construction Contract for fully locally-funded K-12 projects must be initiated via the appropriate DocuSign link from DCM's Engage Portal at <https://engagealabama-rpm.facilityforce.cloud> by the Lead Design Professional Firm.

DCM Form C-5 (fully locally-funded K-12 school project)
revised October 2024

DCM (BC) Project No.

CONSTRUCTION CONTRACT

- (1) _____
- (2) This Construction Contract is entered into this _____ day of _____ in the year of _____
- (3) between the **OWNER**,
Entity Name: _____
Address: _____
Email & Phone #: _____
- (4) and the **CONTRACTOR**,
Company Name: _____
Address: _____
Email & Phone #: _____
- (5) for the **WORK** of the Project, identified as: _____
- (6) The **CONTRACT DOCUMENTS** are dated _____ and have been amended by _____
- (7) **ADDENDA** _____
- (8) The **ARCHITECT** is
Firm Name: _____
Address: _____
Email & Phone #: _____
- (9) The **CONTRACT SUM** is
Dollars (\$) _____) and is the sum of the Contractor's Base Bid for the Work and the following
- (10) **BID ALTERNATE PRICES:** _____
- (11) The **CONTRACT TIME** is _____ () 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 commence on a date to be specified in a Notice to Proceed issued by the Owner (or by the Lead Design Professional on the Owner's behalf), 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.

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

- (13) **SPECIAL PROVISIONS** *(Insert any Special Provisions here, such as acceptance or rejection of unit prices. If Special Provisions are continued in an attachment, identify the attachment below):*

- (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:

License No.:

Classification(s):

Bid Limit:

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.

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)

APPROVAL

**ALABAMA STATE DEPARTMENT OF EDUCATION
(SDE)**
(Required for locally-funded, SDE projects.)

By _____ Date: _____
State Superintendent of Education

CONTRACTING PARTIES

Contractor Company

By _____
Signature

Name & Title _____

Owner Entity

By _____
Signature

Name(s) & Title(s) _____

Routing of the Construction Contract to reviewers and e-signers is automated through DocuSign. DocuSign links for fully locally-funded contract documents are available from DCM's Engage Portal at <https://engagealabama-rpm.facilityforce.cloud>

ARTICLE 37
CONTRACTOR'S and SUBCONTRACTORS' INSURANCE

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

A. GENERAL

(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
- (l) 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. INSURANCE COVERAGES

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:

<u>Coverage</u>	<u>Limit</u>
.1 General Aggregate	\$ 2,000,000.00 per Project
.2 Products, Completed Operations Aggregate	\$ 2,000,000.00 per Project
.3 Personal and Advertising Injury	\$ 1,000,000.00 per Occurrence
.4 Each 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 OR COMMERCIAL EXCESS LIABILITY INSURANCE

(a) Commercial Umbrella or Commercial Excess 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 Combined Primary Commercial General Liability and Commercial Umbrella or Commercial Excess Limits of:

- .1 \$ 5,000,000 per Occurrence
- .2 \$ 5,000,000 Aggregate

(c) Additional Requirements for Commercial Umbrella or Commercial Excess 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."

Exception: projects containing only abatement and/or only demolition do not require Builder's Risk insurance, unless required by the Owner. Note: projects containing any scope of work besides abatement and/or demolition require Builder's Risk insurance.

C. SUBCONTRACTORS' INSURANCE

(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 or Excess 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. TERMINATION of OBLIGATION to INSURE

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 issued for each building.

(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, sub-subcontractors, 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. **Any provision found herein which attempts to waive or invalidate the subrogation interests of Alabama's State Insurance Fund against any party to this contract or any other person or entity is void and invalid. No such waiver is intended or made by the parties to this agreement with regard to any property insured by the State Insurance Fund.**

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

(1) **PERFORMANCE BOND**

Do not staple this form; use clips.

SURETY'S BOND NUMBER

(2) The **PRINCIPAL** (*Company name and address of Contractor as appears in the Construction Contract*)

Name:

Address:

(3) The **SURETY** (*Company name and primary place of business*)

Name:

Address:

(4) The **OWNER** (*Entity name and address, same as appears in the Construction Contract*)

Name:

Address:

(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 SURETY, jointly and severally, hereby bind ourselves, our heirs, executors, administrators, successors, and assigns to the Owner in the Penal Sum stated above for the performance of the Contract, and Contract Change Orders, in accord with the requirements of the Contract Documents, which are incorporated herein by reference. If the Contractor performs the Contract, and Contract Change Orders, in accordance with the Contract Documents, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

2. 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.

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.

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

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 _____, _____.

(9 & 10) **SURETY:**

CONTRACTOR as PRINCIPAL:

Company Name

By _____
Signature

Name and Title

Company Name

By _____
Signature

Name and Title

- (11) **NOTE:** Original power of attorney for the Surety's signatory shall be furnished with each of the original three bond forms to be attached to each of the three contract copies (with original signatures) per project.

Do not staple this form; use clips. Purpose: quickly and efficiently scan thousands of documents into DCM's database.

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

(1) **PAYMENT BOND**

SURETY'S BOND NUMBER

Do not staple this form; use clips.

- (2) The **PRINCIPAL** (Company name and address of Contractor, same as appears in the Construction Contract)

Name:

Address:

- (3) The **SURETY** (Company name and primary place of business)

Name:

Address:

- (4) The **OWNER(s)** (Entity name and address, same as appears in the Construction Contract)

Name:

Address:

- (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 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 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 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.

Numbers in margin correspond to second page of "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:

Company Name

Company Name

By _____
Signature

By _____
Signature

Name and Title

Name and Title

- (11) **NOTE:** Original power of attorney for the Surety's signatory shall be furnished with each of the original three bond forms to be attached to each of the three contract copies (with original signatures) per project.

Do not staple this form; use clips. Purpose: quickly and efficiently scan thousands of documents into DCM's database.

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.1 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”.
- N.2 AWARDING AUTHORITY:** §39-2-1 (1) of the Code of Alabama, 1975, as amended definition: Any governmental board, commission, agency, body, authority, instrumentality, department, or subdivision of the state, its counties and municipalities. This term includes, but shall not be limited to, the Department of Transportation, the Division of Real Property Management of the Department of Finance, the State Board of Education, and any other entity contracting for public works. This term shall exclude the State Docks Department and any entity exempted from the competitive bid laws of the state by statute.
- 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. INTENT

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. COMPLEMENTARY DOCUMENTS

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. INTERPRETATION

- (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. SEVERABILITY.

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. SUPERVISION and CONSTRUCTION METHODS

(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. SUPERINTENDENT

(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. EMPLOYEES

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. DEVIATIONS

(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. ARCHITECT'S REVIEW and APPROVAL

(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. CONFORMANCE with SUBMITTALS

The Work shall be constructed in accordance with approved Submittals.

ARTICLE 10
DOCUMENTS and SAMPLES at the SITE

A. "AS ISSUED" SET

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. "POSTED" SET

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. RECORD SET

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, "Sample 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

SAFETY and PROTECTION of PERSONS and PROPERTY

- 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. GENERAL

- (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. TYPES of INSPECTIONS

(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. UNCOVERING WORK

(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. SPECIFIED INSPECTIONS and TESTS

(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. GENERAL

(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 contractor-owned;
- (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. ADJUSTMENT of the CONTRACT TIME due to CHANGES

(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. CHANGE ORDER PROCEDURES

(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. DEFINITION

"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. PROCEDURES

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. APPLICABILITY of ARTICLE

- (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. CONTINUANCE of PERFORMANCE

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. FINAL RESOLUTION for LOCALLY-FUNDED CONTRACTS

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. SUSPENSION by the OWNER for CONVENIENCE

- (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. TERMINATION by the OWNER for CAUSE

- (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 \$100,000):**
- (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 Contractor 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 of \$100,000 or more):

(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. TERMINATION by the OWNER for CONVENIENCE

(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 reasonably 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. SUSPENSION by the OWNER

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. NONPAYMENT

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. SCHEDULE of VALUES

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" x 11" 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. APPLICATIONS for PAYMENTS

(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) The Applications for Payment of State Agency/Authority projects and Public School and College Authority (PSCA)-funded projects must be activated via the appropriate DocuSign link available from DCM's Engage Portal at <https://engagealabama-rpm.facilityforce.cloud>.

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. RETAINAGE

(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; but after retainage has been held upon fifty percent of the Contract Sum, no additional retainage will be withheld.

F. CONTRACTOR’S CERTIFICATION

(1) Each Application for Payment shall bear the Contractor’s 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. CERTIFICATE of SUBSTANTIAL COMPLETION

(1) When the Work or a designated portion of the Work is substantially complete, the Architect will prepare (via the appropriate DocuSign link available from DCM's [Engage Portal at https://engagealabama-rpm.facilityforce.cloud](https://engagealabama-rpm.facilityforce.cloud)) 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. UPON SUBSTANTIAL COMPLETION

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. BEFORE SUBSTANTIAL COMPLETION

- (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. PREREQUISITES to FINAL PAYMENT

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 DCM Form C-18: Contractor's Affidavit of Payment of Debts and Claims, and a Release of Claims, if any, 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.
- (9) See Manual of Procedures Chapter 7, Section L.7 concerning reconciliation of contract time, if any.

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 less than \$100,000: Advertisement for Completion shall not apply to contractors performing contracts of less than \$100,000.00 in amount. §39-1-1(g)

(2) If the Contract Sum is \$100,000 or more: 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 three weeks. The contractor can publish a notice in one or more of the following ways:

- (a) In a newspaper of general circulation in the county or counties in which the work, or some portion thereof, has been done.
- (b) On a website that is maintained by a newspaper of general circulation in the county or counties in which the work, or some portion thereof, has been done.
- (c) On a website utilized by the awarding authority for publishing notices.
- (d) If no newspaper is published in the county in which the work was done, and if the awarding authority does not utilize a website for the purpose of publishing notices, the notice may be given by posting at the courthouse for 30 days, and proof of the posting of the notice shall be given by the awarding authority and the contractor.

Proof of publication of the notice shall be made by the contractor to the authority by whom the contract was made by affidavit of the publisher or website owner and a printed copy of the notice published. A final settlement shall not be made upon the contract until the expiration of 30 days after the completion of the notice.

D. RELEASE of CLAIMS

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 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. EFFECT of FINAL PAYMENT

(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. GENERAL WARRANTY

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. ONE-YEAR WARRANTY

(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. GENERAL CONTRACTOR'S ROOFING GUARANTEE

(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 Completion shall 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. GENERAL

(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
- (l) 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. INSURANCE COVERAGES

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:

<u>Coverage</u>	<u>Limit</u>
.1 General Aggregate	\$ 2,000,000.00 per Project
.2 Products, Completed Operations Aggregate	\$ 2,000,000.00 per Project
.3 Personal and Advertising Injury	\$ 1,000,000.00 per Occurrence
.4 Each 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 OR COMMERCIAL EXCESS LIABILITY INSURANCE

(a) Commercial Umbrella or Commercial Excess 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 Combined Primary Commercial General Liability and Commercial Umbrella or Commercial Excess Limits of:

- .1 \$ 5,000,000 per Occurrence
- .2 \$ 5,000,000 Aggregate

(c) Additional Requirements for Commercial Umbrella or Commercial Excess 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."

Exception: projects containing only abatement and/or only demolition do not require Builder's Risk insurance, unless required by the Owner. Note: projects containing any scope of work besides abatement and/or demolition require Builder's Risk insurance.

C. SUBCONTRACTORS' INSURANCE

(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 or Excess 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. TERMINATION of OBLIGATION to INSURE

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 issued for each building.

(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, sub-subcontractors, 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. **Any provision found herein which attempts to waive or invalidate the subrogation interests of Alabama's State Insurance Fund against any party to this contract or any other person or entity is void and invalid. No such waiver is intended or made by the parties to this agreement with regard to any property insured by the State Insurance Fund.**

ARTICLE 38
PERFORMANCE and PAYMENT BONDS

A. GENERAL

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. 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 a 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 \$100,000, unless bonds are required for this Contract in the Supplemental General Conditions.

B. PERFORMANCE BOND

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. CHANGE ORDERS

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. EXPIRATION

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. OWNER'S RESERVATION of RIGHT

(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. COORDINATION

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. AWARD of SUBCONTRACTS and OTHER CONTRACTS for PORTIONS of the WORK

(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. SUBCONTRACTUAL RELATIONS

(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. LIMITATIONS of RESPONSIBILITIES

(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. ARCHITECT’S DECISIONS

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. PERMITS, FEES AND NOTICES

- (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. TAXES

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, Code of Alabama, 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. COMPENSATION for INCREASES

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. ALABAMA TRADE BOYCOTT LAW

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.

EE. ALABAMA ECONOMIC BOYCOTT LAW

Per Act 2023-409 as 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, economic boycotts.

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
ROYALTIES, PATENTS, and COPYRIGHTS

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 patented or copyrighted materials, 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. IN-PROGRESS CLEAN-UP

(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. OWNER'S RIGHT to CLEAN-UP

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 iron or steel, that are made a permanent part of the structure, produced in the United States if the Contract Documents require the use of iron or 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

PROJECT SIGN

- A. Fully locally-funded State Agency and Public Higher Education projects: DCM Form C-15: Detail of Project Sign must be included in the project manual regardless of expected bid amount. If the awarded contract sum is \$100,000.00 or more, Contractor shall furnish and erect a project sign. Other conditions besides the contract sum may warrant waiver of this requirement, but only with approval of the Technical Staff.
- B. Fully locally-funded K-12 school projects: Project sign is not required unless requested by Owner; if project sign is requested by Owner, include DCM Form C-15: Detail of Project Sign in the project manual.
- C. Partially or fully PSCA-funded projects: DCM Form C-15: Detail of Project Sign must be included in the project manual. Contractor shall furnish and erect a project sign for all PSCA-funded projects, regardless of the contract sum. "Alabama Public School and College Authority" as well as the local owner entity must be included as awarding authorities on the project sign of all PSCA-funded projects.

When required per the above conditions, 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 project sign is required, which shall be erected on one of the sites in a location selected by the Architect and Owner. Slogan: The title of the current PSCA Act should be placed on the project sign of all PSCA-funded projects, otherwise the Awarding Authority/Owner's slogan, if any, should be used. If the Awarding Authority/Owner of a fully locally-funded project does not have a slogan, the project sign does not require a slogan.

END of
GENERAL CONDITIONS of the CONTRACT

SUPPLEMENT TO THE GENERAL CONDITIONS OF THE CONTRACT

- 1.1 The following supplements shall modify, delete and/or add to the General Conditions of the Contract. Where any article, paragraph or subparagraph in the General Conditions is supplemented by one of the following paragraphs, the provisions of such article, paragraph, or subparagraph shall remain in effect and the supplemental provisions shall be considered as added thereto. Where any article, paragraph or subparagraph in the General Conditions is amended, voided or superseded by any of the following paragraphs, the provisions of such article, paragraph or subparagraph not so amended, voided or superseded shall remain in effect.

A. **Refer to Article 2.A; Definition:**

1. **Architect:** Construction documents for this project have been developed by Lathan Mckee, Architects, 631 South Hull Street, Montgomery, Alabama, 36104, (334) 834-9933 `commissioned by the Owner.
2. **Owner:** **Baldwin County Public Schools.** Unless otherwise stated, all papers required to be delivered to the Owner shall be forwarded through the Architect.

B. **Refer to Article 3:**

1. Add the following:
 - a. **Contractor's Qualification's:** The Roofing Contract shall possess the following, or stringent, minimum qualifications: the roofing contractor must be a firm of not less than five (5) years of successful experience in installation of roof systems similar to those specified for the project and which is acceptable to or licensed by the manufacturer of the primary roofing materials.
 - b. **Manufacturer's Qualifications:** In specifying acceptable manufacturers or minimum quality qualifications of manufacturers, the following, or more stringent criteria should be used: The manufacturer shall have a minimum of five (5) years of experience in the manufacture of the roofing system and must also be the **original material manufacturer** of the primary roofing material.

C. **Refer to Article 6;**

1. Add the following to Paragraph B:
 - a. The lowest bidding Contractor shall submit to the Architect within five (5) calendar days after the bid date the name(s) of the Superintendent(s) who will be in charge at the work site, along with the qualifications and experience.
 - b. NOTE: By submission of a Proposal the Bidder agrees that the Owner or Architect may reject a proposed Superintendent with or without a stated reason with no recourse to the Contractor.

D. **Refer to Article 6;**

1. Add the following to Paragraph C:
 - a. All labor shall be performed in the best and most workmanlike manner by persons skilled in their respective assignments or trades. Workmen whose work is unsatisfactory to the Architect or the Owner, or who are considered unfit or unskilled, or otherwise objectionable, shall be dismissed upon notice from the Architect or Owner.

E. **Refer to Article 9, Paragraph D;**

1. Add the following:
 - a. All submittals for color selections, to be made by the Architect for the entire project shall be submitted at the same time within 45 days from the "Notice to Proceed". Piece-meal submittals for color selection will not be permitted.
 - b. **Provide as follows unless otherwise specified:**

- 1) All submittals shall be sent to the Architect no later than **45 calendar days** from "Notice To Proceed" to: **Submittal Exchange** subex-sales_ww@oracle.com if applicable. A **Submittal Log** must accompany each submittal.
- 2) Refer to Article 41, paragraph A "Subcontracts", section (1):
 1. As required by the Supplemental General Conditions, the Contractor must provide the total cost for each of the following divisions:
 - a. Civil
 - b. Plumbing
 - c. Mechanical
 - d. Electrical
 - e. These submissions shall have the above requested costs and Architectural Project Number provided in a single document and emailed prior to the full execution of the project.
- 3) For projects requiring the use of Submittal Exchange, logs for the project shall be set up to mimic the Architectural Project numbered 22-192 and must include the following:

• Submittal	* Drawings
• Closeout	* Photos
• RFI	* Punchlist/Issue Management
• RFP	* COR
• ASI	* Pay Application
• Meeting Minutes	

F. Refer to Article 13:

1. Add the following:
 - a. "If the bidder desires to substitute an "equal", he must secure written approval by the Architect of qualification to bid ten (10) days prior to date.
 - b. On all items specified as or equal substitutions must be submitted to the Architect ten (10) days prior to bid opening and Architect will act on substitution five (5) days prior to bids and notify all Contractors.
 - c. The request for substitutions are to be filled out completely and must be received prior to bid. Any subcontractor and/or material supplier that was not "approved" and their price is used at bid time will be the Contractors problem to absorb any cost associated with the use of a "non-approved material or equipment. If the "approval" is not listed in the addendum, then the "approval" is not accepted.

G. Refer to Article 15:

1. The General Contractor shall be solely responsible for all requirements under this Article.

H. Refer to Article 16:

2. Add the following: Article 16; General, (5)
 - a. **Single-Ply Roofs:** Should design or economic restrictions require the use of a single-ply elastomeric roofing system, ballasted systems of any type should be avoided.
 - b. **Interior Gutters:** The use of interior gutters should be avoided at all times.
 - c. **Protection During Application:** At no time during construction should the surface of the asphalt or coal tar pitch roofing system to be left unprotected. A glaze coat of asphalt or pitch must be applied to the surface of the membrane if the top pour or cap sheet cannot be applied during the same day.
 - d. **Contractor's Qualification's:** The Roofing Contract shall possess the following, or stringent, minimum qualifications: the roofing contractor must be a firm of not less than five (5) years of successful experience in installation of roof systems similar to those specified for the project and which is acceptable to or licensed by the manufacturer of the primary roofing materials.

e. Manufacturer's Qualifications: In specifying acceptable manufacturers or minimum quality qualifications of manufacturers, the following, or more stringent criteria should be used: The manufacturer shall have a minimum of five (5) years of experience in the manufacture of the roofing system and must also be the **original material manufacturer** of the primary roofing material.

I. Refer to Article 19:

1. In conjunction with Division of Construction Management Change Order documents provide all data required for Lathan McKee Architects Form 0825 when submitting a Change Order Proposal

J. Refer to Article 29, PROGRESS PAYMENTS, paragraph "B", Schedule of Values:

1. Amend Paragraph as follows:

a. "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 **'and category of Work with Subcontractor name(s)'** of the various parts of the Work for billing purposes."

2. Add the following:

a. The Contractor shall list the Category of Work with the Subcontractor name(s) attributable to each line item value in the column "B", "Description of Work" line(s) of the DCM Form C-10SOV, Schedule of Values.

3. Add the following:

a. Values shall be broken down within principal contracts in amounts not greater than \$30,000, but in no case greater than 5 percent of the Contract Sum.

K. Refer to Article 32, SUBSTANTIAL COMPLETION

1. Add the following:

- a. All manufacturers' warranties shall commence on the date as set forth on the Substantial Completion Form, no exceptions.
- b. Contractor shall furnish to the Architect a written letter of "notification" that all "Punch List" items have been completed prior to re-inspection.

L. Refer to Article 35, paragraph "D", Special Warranties:

1. Change as follows:

a. 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.

M. Refer to Article 37:

1. The Architect shall not be liable for any damage or injury to property or any person or persons arising from the presence of/or effects of any hazardous materials or hazardous elements in any state of form in connection with the work under this Contract. All such liability shall lie with the Contractor.

2. ADD the following to Subparagraph B(5) "Builders Risk Insurance":

As part of the General Contractors Builder's Risk, the General Contractor shall include in his Base Bid a 5% deductible allowance against wind damage during the construction of the building. This amount shall be refunded to the Owner if unused at the end of the construction project.

N. Refer to Article 44:

1. Add the following: All work on this project shall be performed in accordance with the following codes:

a. 2010 ADA Standards For Accessible Design

Site Improvements and Interior Alterations to
Foley High School for the
Baldwin County Public Schools
Fairhope, Alabama

SUPPLEMENT TO THE GENERAL CONDITIONS OF
THE CONTRACT
PAGE-3

- b. 2021 International Building Code
- c. 2021 International Plumbing Code
- d. 2021 International Mechanical Code
- e. 2021 International Fuel Gas Code
- f. 2021 International Fire Code
- g. 2020 National Electrical Code
- h. 2019 National Fire Alarm and Signaling Code
- i. ANSI/ASHRAE/IESNA Standard 90.1-2013 Energy Standard for Buildings Except Low-Rise Residential

O. **Refer to Article 49:**

- 1. Liquidated damages will be assessed at a rate of 6% per annum.
- 2. If this contract extends thirty (30) days past Schedule Completion Date, Owner shall deduct from the Contractor's final payment, a sum equal to the additional expense incurred by the Owner for the Architect for contract administration past scheduled completion date.

END OF SECTION



State of Alabama Disclosure Statement

(Required by Act 2001-955)

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:

☐

Contract

☐

Proposal

☐

Request for Proposal

☐

Invitation to Bid

☐

Grant Proposal

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

1. 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

OVER

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.)

NAME OF FAMILY MEMBER	ADDRESS	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:

NAME OF PAID CONSULTANT/LOBBYIST	ADDRESS

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 _____

Act 2001-955 requires the disclosure statement to be completed and filed with all proposals, bids, contracts, or grant proposals to the State of Alabama in excess of \$5,000.



Kay Ivey
Governor

Bill Poole
Director of Finance

STATE OF ALABAMA
DEPARTMENT OF FINANCE
REAL PROPERTY MANAGEMENT
Division of Construction Management

P.O. Box 301150, Montgomery, AL 36130-1150
770 Washington Avenue, Suite 444, Montgomery, AL 36104
Telephone: (334) 242-4082 Fax: (334) 242-4182



Mickey Allen
Assistant Finance Director
Real Property Management

Frank Barnes, Director
Construction Management

E-Verify Memorandum of Understanding

Instructions for inclusion in project manuals.

Per DCM's May 29, 2012 bulletin *Guidance on Act 2012-491 Amending the Alabama Immigration Law*: "Contractors (including architects and engineers) will ... be required to enroll in the E-Verify program and to provide documentation of enrollment in the E-Verify program with their contracts or agreements."

Upon completing enrollment in the E-Verify program available at <https://www.e-verify.gov/employers/enrolling-in-e-verify>, an E-Verify Memorandum of Understanding (MOU) is issued to the enrolled business. The same E-Verify MOU can be repeatedly used until any information in the business's E-Verify user profile is updated, at which time E-Verify updates the printable Company Information section of the MOU, while the original signatory information remains the same. Typically, an E-Verify MOU is 13-18 pages long depending on business type and number of employees.

DCM requires a copy of the entire current E-Verify MOU document including the completed Department of Homeland Security – Verification Division section (with name, signature and date included) to be submitted as an attachment to each Construction Contract original and to each Agreement Between Owner and Architect original.



Supplemental E-Verify Memorandum of Understanding

Contractors (including architects and engineers) will be required to enroll in the E-Verify program and to provide documentation of enrollment in the E-Verify program with their contracts or agreements per Alabama Immigration Law.

McKee and Associates Architects requires a copy of the entire current E-Verify MOU document including the completed Department of Homeland Security – Verification Division section (with name, signature and date included) to be submitted as an attachment to each Construction Contract original and to each Agreement Between Owner and Architect original.

Refer to State of Alabama E-Verify Memorandum of Understanding Instructions (Revised August 2021) with ABC Bulletin (May 29, 2012) and Revised Alabama Immigration Law Guidance for School Boards (Revised May 2012).



ALABAMA DEPARTMENT OF REVENUE
SALES AND USE TAX DIVISION
P.O. Box 327710 • Montgomery, AL 36132-7710

ST: EXC-01
11/23

Application For Sales and Use Tax Certificate of Exemption

FOR GOVERNMENT ENTITY PROJECT

This Certificate of Exemption will be limited to purchases which qualify for an exemption of sales and use taxes pursuant to Rule No. 810-6-3-.77

PROJECT INFORMATION:

PROJECT NAME		PROJECT OWNER'S FEIN (EXEMPT ENTITY)	
STREET ADDRESS OF PROJECT (CITY AND COUNTY INCLUDED)	CITY	ZIP	COUNTY

APPLICANT'S INFORMATION:

RELATION: (CHOOSE ONE)

☐ Government Entity ☐ Statutorily Exempt Entity ☐ General Contractor ☐ Subcontractor

APPLICANT'S LEGAL NAME		FEIN	
DBA		CONSUMER'S USE TAX ACCOUNT NUMBER	
MAILING ADDRESS: STREET	CITY	STATE	ZIP
		COUNTY	

CONTACT PERSON	BUSINESS TELEPHONE NUMBER ()
EMAIL ADDRESS	

PROJECT START DATE	PROJECT END DATE
WILL THE APPLICANT HAVE ANY SUBCONTRACTORS ON THIS JOB? ☐ Yes ☐ No If yes, please attach list.	NAME OF PARTY TO THE CONTRACT
JOB DESCRIPTION	

WILL ANY POLLUTION CONTROL EXEMPTION BE APPLICABLE? ☐ Yes ☐ No	ESTIMATED POLLUTION CONTROL COST \$	
TOTAL PROJECT BID AMOUNT (APPLICANT'S PORTION OF PROJECT) \$	LABOR COST (APPLICANT'S PORTION OF PROJECT) \$	MATERIAL COST (APPLICANT'S PORTION OF PROJECT) \$

REVENUE DEPARTMENT USE ONLY

PENDING DOCUMENTATION / INFORMATION:

☐ GCL ☐ SBL ☐ Contract / NTP / LOI ☐ LOS ☐ Project Dates / Breakdown of Costs

Contact Dates: _____ Received Date: _____

Forwarded for Denial: _____

PROJECT NAME

PROJECT OWNER'S FEIN (EXEMPT ENTITY)

FORM OF OWNERSHIP:

☐ Individual ☐ Partnership ☐ Corporation ☐ Multi member LLC ☐ Single member LLC ☐ Government Entity

If applicant is a corporation, a copy of the certified certificate of incorporation, amended certificate of incorporation, certificate of authority, or articles of incorporation should be attached. If the applicant is a limited liability company or a limited liability partnership, a copy of the certified articles of organization should be attached.

OWNERSHIP INFORMATION:

Corporations – give name, title, home address, and Social Security Number of each officer.

Partnerships – give name, home address, Social Security Number or FEIN of each partner.

Sole Proprietorships – give name, home address, Social Security Number of owner.

LLC – give name, home address, and Social Security Number or FEIN of each member.

LLP – give name, home address, and Social Security Number or FEIN of each partner.

NAME (PLEASE PRINT)

SIGNATURE

TITLE

DATE

REVENUE DEPARTMENT USE ONLY

PENDING OTHER:

☐ Government Entity ☐ General Contractor ☐ Not on LOS

Contact Dates: _____ Received Date: _____

Forwarded for Denial: _____

Examiner's Remarks _____

Examiner _____ Date _____

Instructions For Preparation of Form ST: EXC-01

Sales and Use Tax Certificate of Exemption for Government Entity Project

NOTE: Exemption Certificates will be issued as of the project start date or the received date of the application. If, upon receipt of the application, the project has already commenced, the certificate will be issued as of the received date of the application. Any purchases made prior to the issuance of a certificate will not be exempt.

In order to expedite the processing of your application, please include the following documentation when submitting your application:

Exempt Entity:

1. Signed Application
2. Copy of Executed/Signed Contract, Letter of Intent, Notice of Award, and/or Notice to Proceed

General Contractor:

1. Signed Application
2. Copy of Executed/Signed Contract, Letter of Intent, Notice of Award, and/or Notice to Proceed
3. List of Subcontractors
4. Alabama Board of General Contractor's License
5. State/County Business License (usually obtained through county probate office)

Subcontractor:

1. Signed Application
2. Alabama Board of General Contractor's License
3. State/County Business License (usually obtained through county probate office)
4. List of Subcontractors (if any)

General contractors and subcontractors:

- Any additions and/or deletions to the list of subcontractors working on a project must be submitted to the Department within 30 days of occurrence.
- If an extension is needed for a project, please contact the Department of Revenue at the address, number, or email listed below. Extension requests should be submitted no more than 30 days after expiration date.
- Subcontractors Project Start Date should be the date they will begin working on the project and ordering materials

The application and required documentation may be mailed, faxed, or emailed to the following:

Fax: (334) 353-7867

Email: STContractorsExempt@revenue.alabama.gov

Mailing Address: ATTN: Contractor's Exemption
Alabama Department of Revenue
Sales & Use Tax Division
Room 4303
PO Box 327710
Montgomery, AL 36132-7710



ALABAMA DEPARTMENT OF FINANCE REAL PROPERTY MANAGEMENT Division of Construction Management

www.dcm.alabama.gov, 334-242-4082, inspections@rpm.alabama.gov

Revised October 2025

Department Use Only

Invoice # _____

PERMIT FEE CALCULATION WORKSHEET

DCM # _____ Date _____

Project Name; Owner/Architect/Engineer Project # & Phase/Package # _____

Owner Entity Name _____

Architect/Engineer Firm Name _____

Contractor Company Name _____

Awarded Contract Sum: _____

Email address(es) for Payment Receipt: _____

BASIC PERMIT FEE CALCULATION:

Awarded Contract Sum up to \$100,000 \$200.00 fee

Awarded Contract Sum is \$100,001 - \$250,000 \$400.00 fee

Awarded Contract Sum is \$250,001 - \$1,000,000

Contract Sum less \$250,000= _____ /1,000 x \$0.80 + \$200.00= _____ x 2 = _____

Awarded Contract Sum is \$1,000,001 - \$10,000,000

Contract Sum less \$1,000,000= _____ /1,000 x \$0.60 + \$800.00= _____ x 2 = _____

Awarded Contract Sum is \$10,000,001 - \$50,000,000

Contract Sum less \$10,000,000= _____ /1,000 x \$0.40 + \$6,200.00= _____ x 2 = _____

Awarded Contract Sum is \$50,000,001 and up

Contract Sum less \$50,000,000= _____ /1,000 x \$0.20 + \$22,200.00= _____ x 2 = _____

TOTAL DUE: _____

Permit fees are not owed for fully locally funded K-12 and 4-year public University projects for capital improvement or alterations with estimated cost of \$750,000.00 or Less. Determination of whether a project is subject to the Locally-Funded \$750,000.00 or Less exception for inspections is based on the total of bids received for all phases and bid packages for the project. Inspections are still required for such projects.

Basic Permit Fee: Covers all required pre-construction conferences, construction inspections and certificate of substantial completion issuance by the DCM Inspector. This fee is due when a construction contract or self-performance letter is received by DCM and must be paid before the required Pre-Construction Conference is scheduled with the DCM Inspector.

Permit Re-Inspection Fee: A fee of \$1,500.00 per occurrence may be charged if (A) the contractor has not completed the work required for the particular inspection as detailed in DCM Form B-8: Pre-Construction Conference Checklist, or (B) the inspection is canceled or rescheduled without the required minimum 48 hours notice to all parties.

Make check payable to: "Finance - Construction Management", include the DCM 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 and payments using Public School and College Authority (PSCA) funds: contact Jennie Jones at 334-242-4808 or jennie.jones@rpm.alabama.gov.

Fees may be paid online at www.dcm.alabama.gov (in which case a completed fee worksheet is not required). The Basic Permit Fee is subject to Final Reconciliation of Fees at the end of construction.

The Basic Permit Fee is subject to Final Reconciliation of Fees at the end of construction.

PRE-CONSTRUCTION CONFERENCE CHECKLIST

The following are recommended topics to be covered during the required Pre-Construction Conference. Contact the DCM Project Inspector via DCM's Engage Portal at least fourteen (14) days prior to scheduling the conference.

**Shall be discussed while owner is present*

	*1. Name and relationship to job of local Owner personnel
	2. Public officials involved
	3. Names of architect/engineer personnel involved
	4. Provide e-mail addresses on Pre-Construction Sign-in sheet
	5. Construction sets of plans available to contractor
	6. Verify alternates accepted, etc.
	7. Approved list of sub-contractors
	*8. Point of contact for project. Project Manager _____ Job Superintendent _____
	9. Approved cost breakdown (DCM Form C-10SOV) & Progress Schedule (DCM Form C-11)
	*10. Method of approving monthly payment requests • All State Agency, PSCA-funded University, and PSCA-funded K-12 projects: payment applications must be submitted via DocuSign PowerForm links available from DCM's Engage Portal. • Fully locally-funded University and fully locally-funded K-12 projects: submit payment applications per Owner requirements.
	*11. Time Extensions
	*12. Overall phasing of job
	13. Project limits
	14. Shop drawings, time to process
	*15. Sales tax savings (Alabama Department of Revenue)
	*16. Project sign and other job signs
	17. ADEM permit, if more than one acre of land is disturbed. • Coordinate offsite storm water drainage with the authority having jurisdiction when applicable.
	18. DCM Inspection Minimum Requirements.
	19. Advance notice for required DCM inspections The contractor will notify the architect by email of the date the project will be ready for an inspection by the Division of Construction Management. Inspections must be requested via DCM's Engage Portal 14 days in advance. When the DCM Inspector confirms the inspection date and time, the architect will send an email confirming the inspection date and time to all parties as well as a copy to inspections@rpm.alabama.gov . An Outlook calendar invite is also suggested for all inspections. Cancellations of any scheduled inspection must be received in writing no later than 48 hours prior to the scheduled inspection. If the inspection is canceled, it will be rescheduled subject to the DCM Inspector's availability. Cancellations received less than 48 hours in advance shall incur a \$1,500.00 re-inspection fee. If the project is not ready for the scheduled inspection, the General Contractor shall incur a \$1,500.00 re-inspection fee.

	20. <u>Pre-Construction Conference</u>: Required Attendees: DCM Inspector, Contractor, Owner, Architect, Major Subs - Fully-executed construction contract and Notice to Proceed - Verification of permit fee payment (Exception: fully locally-funded K-12 & public four-year University capital improvement, HVAC, or roof projects with an estimated cost of \$750,000.00 or Less, are exempt from DCM Fees.) - Fire alarm contractor and fire sprinkler contractor certification (from State Fire Marshal) - ADEM permit, if more than one acre of land is disturbed. - The General Contractor to perform and furnish all work, labor, services, supervision, materials, equipment, tools, scaffolds, appliances, insurance, taxes, and other things necessary to complete the work in strict accordance with all plans, specifications, and GENERAL CONDITIONS. The Contractor shall be liable for any omissions in contractors bid proposal or any other interpretations made by contractor. All items of Work related to each are to be provided so that no gaps, omissions, or conflicts arise that prevents a complete and functioning result. - Contractor's duty to coordinate work of separate contractors.
	21. <u>Pre-Construction Conference for Storm Shelter</u>: Required Attendees: DCM Inspector, Contractor, Owner, Architect, Structural Engineer, Major Subs, Special Inspections Representative - The completed & signed DCM Form B-15: Owner's Statement of Responsibility for Tornado Storm Shelter (Hurricane Shelter Where Applicable) must be submitted to the DCM Inspector at Pre-Construction Conference. Must be kept with Owner's storm shelter records. - The completed & signed DCM Form C-17: Contractor's Statement of Responsibility for Construction of Tornado Storm Shelter (Hurricane Shelter Where Applicable) along with required Quality Assurance Plan (QAP) must be submitted to DCM Inspector at Pre-Construction Conference. - The completed and signed DCM Form B-14: Certification of Structural Observations from the Structural Engineer of Record must be attached to the Certificate of Substantial Completion form via DocuSign link available from DCM's Engage Portal. - Storm Shelter Impact-protective systems Listing and labeling: Impact-protective systems shall be listed and labeled. Marking: The following function and performance characteristics shall be provided on the label for each impact protective system tested: - Manufacturer's identification reference or listing number for the assembly. - Type of impact-protective system, such as window assembly, door assembly shutter assembly or louver. - Hazard: hurricane, tornado, or both. - Missile weight and speed. - Design wind pressure. - Edition of ICC 500.
	22. <u>Pre-Roofing Conference</u>: Required Attendees: DCM Inspector, Contractor, Owner, Architect, Roofing Sub, Roofing Manufacturer's Representative - This conference shall be conducted by the design professional as described in Chapter 5, Section C.4 of the DCM Manual of Procedures. - Roofing submittals must be approved by the architect prior to pre-roofing conference. - Roofing manufacturer must provide documentation that roof design and roofing materials meet code requirements for wind uplift and impact resistance. - Copy of sample roof warranty – Note: Standard manufacturer's roofing guarantees which contain language regarding the governing of the guarantee by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such guarantees. - Contractor shall video existing building interior and exterior prior to roofing operations and provide copy to owner. - General Contractor's Roofing Guarantee and Manufacturer's Roofing Warranties must be presented to DCM Inspector at Final Inspection and submitted with Certificate of Substantial Completion for all projects via DocuSign PowerForm links available from DCM's Engage Portal.

	23. <u>Above Ceiling Inspections</u>: Required Attendees: DCM Inspector, Contractor, Owner, Architect, MEP Engineers, Major Subs • All work must be completed except for installation of ceiling tiles, and/or hard ceilings. • Space must be conditioned. • Permanent power must be connected unless otherwise arranged with the DCM Inspector. • Grease duct must be inspected and approved by the DCM Inspector prior to fire wrapping and above-ceiling inspection.
	24. <u>Life Safety Inspections and Final Inspection</u>: Required Attendees: DCM Inspector, Contractor, Owner, Architect, Engineers, Major Subs, Local Fire Marshal • Fire alarm certification • Kitchen hood fire suppression system certification • General contractor's 5-year roofing guarantee (DCM Form C-9) • Roofing manufacturer's warranty • Above ground and below ground sprinkler certifications • Completed certificate of structural engineer's observations (for storm shelter) • Emergency and exit lighting tests. • Fire alarm must be monitored. • Elevator inspection completed and certificate of operation provided by the State of Alabama Department of Labor • Boiler/vessels inspection completed, and certificate of operation provided by the State of Alabama Department of Labor • Pressure test/Flush test for underground sprinkler lines (witnessed by local fire marshal, fire chief and/or DCM Inspector) • Flush/pressure test for new and/or existing fire hydrants • Must have clear egress/access and emergency (for first responders) access to building • Must have ADA access completed. • Comply with ADA requirements: plumbing fixture heights, toilet partition widths, turnaround, signage, parking lot striping and signage, etc. • Emergency Responder Radio Coverage
	25. <u>Year-End Inspection</u>: Required Attendees: DCM Inspector, Contractor, Owner, Architect, Engineers and/or Major Subs may be required. • Owner's list of documented warranty items • Reconciliation of user fees with DCM shall be completed prior to inspection
	26. Other inspections required before work is covered
	27. Third-party inspections/special inspections. Structural components, Roofing, Geotechnical, Commissioning, lab tests, etc.
	28. Procedure if bad soil or rock is encountered: Geotech and special inspections
	29. Inspection report distribution – weekly per Owner-Architect Agreement. All site inspections and observations are to be recorded and transmitted to the DCM Inspector via DCM's Engage Portal. The design professional must also concisely report any deficiencies encountered, problems or questions raised by the contractor, instructions or answers given to the contractor, and administrative or construction delays observed. The design professional must endeavor to write his or her reports utilizing descriptions of components and areas that are consistent with descriptions contained in the plans and specifications so that the "third-party reader" can understand what is being discussed and where it is located in the project. Photographs may be included for clarity. Keep photos to a minimum. Each report shall also be distributed by the design professional to the Owner and contractor promptly after conducting an inspection so that all parties are kept current regarding events on the project.
	30. Ready mix plant, file delivery tickets, slump tests, cylinders. Quality of concrete work; concrete testing
	31. Light gauge metal roof framing and/or wood truss framing to be inspected by the structural engineer.

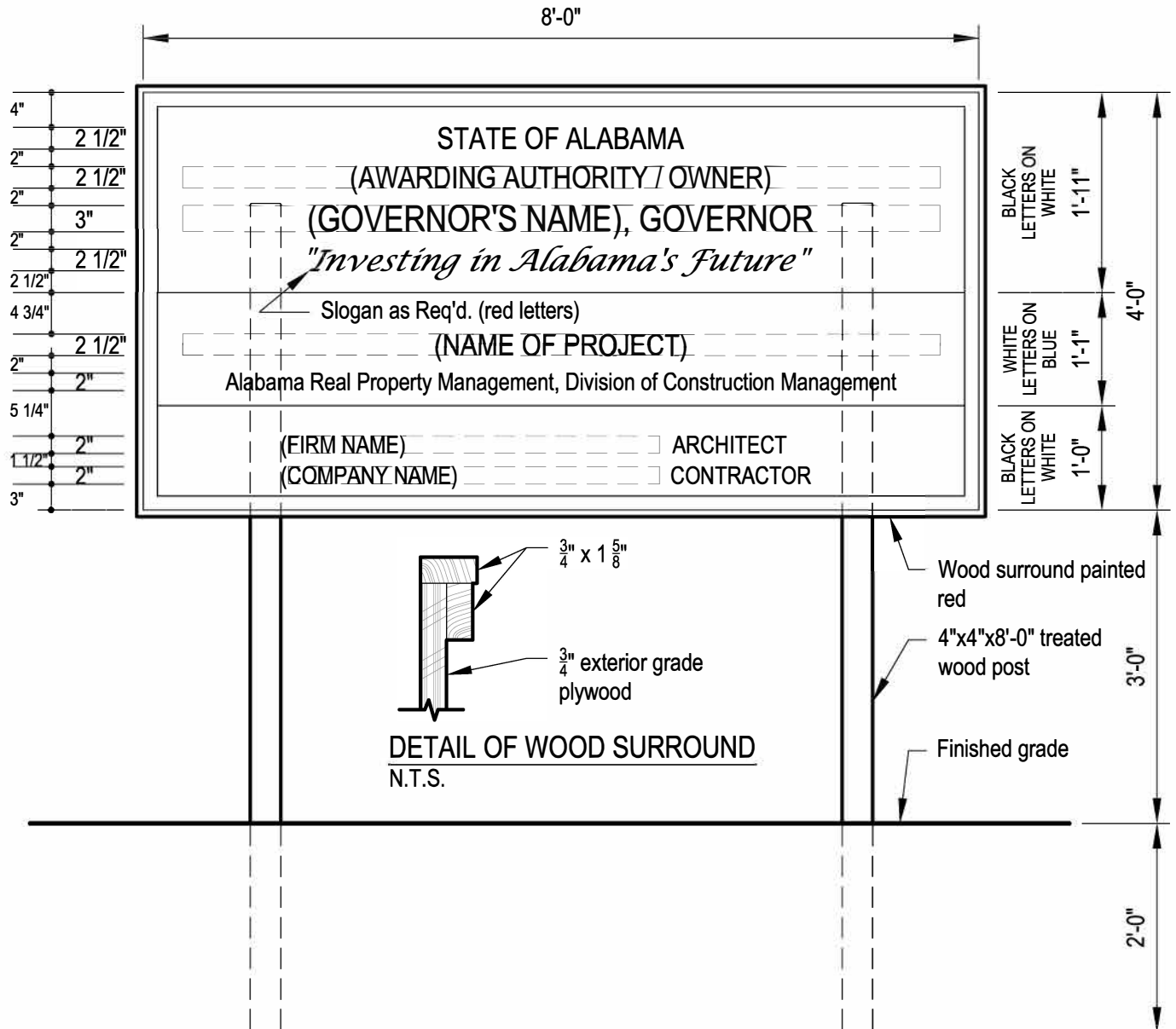
	32. Record Drawings and As-Built Drawings: Contractor will maintain a set of drawings designated solely for As-Built Drawings to satisfy its closeout requirements. Contractor/Subcontractor shall, on a weekly basis, record all changes, revisions, modifications, additions, etc. to accurately reflect its completed work.
	33. Protection Of the Work: The General Contractor shall carefully secure and protect the work and all materials, equipment, or work of Sub-Contractors and others in the vicinity of the work and shall be liable for any loss or damage that results from Contractor's failure to do so.
	*34. Use of site and existing building, access drive, signs
	*35. Conduct of contractor's personnel: No interaction with staff and/or students. No foul language, no smoking or use of tobacco products, no drugs, and no firearms on school property.
	*36. Use of existing toilets
	*37. Coordinate any utilities supplied by Owner
	*38. Coordinate outages and work in existing building with Owner
	*39. Keeping existing exit paths open
	*40. Routine job clean-up to be perform daily. Clean-up areas where work is performed including paths of access/egress utilized by Contractor's personnel and equipment. All generated waste and debris will be placed in dumpsters or other containment boxes.
	41. O.S.H.A. - Report all accidents - safety General Contractor's responsibility
	42. Contractor is reminded of obligation to comply with the Alabama Child Labor Law and E-Verify
	43. Building location relative to critical property line, easement, setback, etc.
	44. Surveyor to check foundation wall if location critical
	45. Verify sanitary outfall before committing floor level
	46. Stockpiling topsoil
	47. Protecting trees
	48. Soil Treatment, mix on site in presence of Job Superintendent
	49. What is expected of masonry work, mortar additive
	50. Problems with hollow metal - install proper fire labels
	51. Potential conflict of mechanical and electrical equipment; shop drawings
	52. Return air plenums (no combustibles)
	53. Fire damper installation issues
	54. Kraft-faced insulation is not to be installed exposed.
	55. Coordinate with local fire authority to assure access to the building for firefighting equipment during construction and before final acceptance. Provide fire extinguishers as required.
	56. Comply with fire hydrant requirement; coordinate with local Fire Authority or State Fire Marshal.
	*57. Certificate of Substantial Completion/Final Inspection All projects: Certificate must be activated via DocuSign link after final inspection and receipt of DCM Inspector's report. The correct DocuSign link is available from DCM's Engage Portal.
	58. Release of retainage – 30 days to complete punch list and closeout
	*59. Project Closeout - precedes Final Payment a. Warranties b. Operating and Maintenance Manuals c. As-built Drawings d. Other requirements

60. Advertisement of Completion - start ad after substantial completion

- a. for projects less than \$100,000.00, Advertisement of Completion is not required.
- b. for projects \$100,000.00 or more, Contractor advertises for 3 weeks. The contractor can publish a notice using one or more of the following methods:
 - In a newspaper of general circulation in the county or counties in which the work, or some portion thereof, has been done.
 - On a website that is maintained by a newspaper of general circulation in the county or counties in which the work, or some portion thereof, has been done.
 - On a website utilized by the awarding authority for publishing notices.
 - If no newspaper is published in the county in which the work was done, and if the awarding authority does not utilize a website for the purpose of publishing notices, the notice may be given by posting at the courthouse for 30 days, and proof of the posting of the notice shall be given by the awarding authority and the contractor.

DETAIL OF PROJECT SIGN

N.T.S.



Notes:

1. Fully locally-funded State Agency and Public University projects: DCM Form C-15 must be included in the project manual regardless of expected bid amount. If the awarded contract sum is \$100,000.00 or more, Contractor shall furnish and erect a project sign.
Fully locally-funded K-12 school projects: Project sign is not required unless requested by Owner, if project sign is requested by Owner, include DCM Form C-15 in the project manual.
Partially or fully PSCA-funded projects: DCM Form C-15 must be included in the project manual. Contractor shall furnish and erect a project sign for all PSCA-funded projects, regardless of contract sum. "Alabama Public School and College Authority" as well as the local owner entity must be included as awarding authorities on the project sign of all PSCA-funded projects. Exception: Alabama Community College System (ACCS) PSCA-funded projects with Notice-To-Proceeds issued after July 31, 2021 are not submitted to DCM.
Fully locally-funded ACCS projects with Notice-To-Proceeds issued prior to August 1, 2021: DCM Form C-15 must be included in the project manual regardless of expected bid amount. If the awarded contract sum is \$100,000.00 or more, Contractor shall furnish and erect a project sign.
2. Sign to be constructed of 3/4" exterior grade plywood.
3. Paint with two coats best grade exterior paint before letters are painted. Option: In lieu of painted lettering on plywood, a corrugated plastic sign (displaying the same lettering, layout and colors as above) may be secured directly to the unpainted exterior grade plywood.
4. Sign shall be placed in a prominent location and easily readable from existing street or roadway.
5. Sign shall be maintained in good condition until project completion.
6. Slogan: Act 2020-167's title *"Investing In Alabama's Future"* should be placed on the project signs of all PSCA-funded projects, otherwise the Awarding Authority/Owner's slogan, if any, should be used. If the Awarding Authority/Owner of a fully locally-funded project does not have a slogan, the project sign does not require a slogan.

DCM (BC) No. _____

PSCA Projects: PSCA No. _____

Application No. _____

Date: _____

APPLICATION and CERTIFICATE for PAYMENT

Attach DCM Form C-10SOV: Schedule of Values

TO OWNER: Entity Name: Address:	PROJECT:
FROM CONTRACTOR: Company Name & Address, which must exactly match co. name & payment address spelling as registered in State of AL Accounting & Resource System (STAARS) or AL Buys to avoid rejection: STAARS or AL Buys Vendor #:	ARCHITECT / ENGINEER: Firm Name: Address:

A. Total Original Contract	\$	
B. Fully Executed (fully signed) Change Order(s) Numbers ___ through ___	+\$	_____
C. Total Contract To Date	\$	_____
1. Work Completed to Date per attached Schedule of Values <i>(Form C-10SOV's Column F Total)</i>	\$	_____
2. Materials Presently Stored <i>(When this amount is greater than \$0.00, attach Form C-10SM: Inventory of Stored Materials, or similar list)</i>	+\$	_____
3. Total Work Completed to Date & Materials Presently Stored <i>(_____% of Contract To Date)</i>	\$	_____
4. Less Retainage <i>(If Total Work Completed to Date & Materials Presently Stored (#3) is less than or equal to 50% of Total Contract to Date (C), Retainage = #3 x 0.05. Once #3 exceeds 50% of C and up until project is complete, Retainage = C x 0.025. \$0 is retained on final payment application, see last bullet point below Instructions.)</i>	-\$	_____
5. Total Due	\$	_____
6. Less Total Previous Payments Billed <i>(Must exactly match #5 Total Due from previous payment application. # 6 is \$0.00 if there is no previous payment application)</i>	-\$	_____
7. Balance Due This Estimate	\$	_____

Final pay app?
☐ Yes.

CONTRACTOR'S CERTIFICATION The undersigned Contractor certifies that to the best of his knowledge, information, and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by him for Work for which previous Certificates for Payments were issued and payments received from the Owner and that current payment shown herein has not yet been received. By: _____ Date: _____ Contractor's Signature Name & Title _____ Sworn and subscribed before me this _____ day of _____ Month, Year Seal: _____ Notary Public's Signature	ARCHITECT'S / ENGINEER'S CERTIFICATION In accordance with the Contract Documents, the Architect/ Engineer certifies to the Owner that, to the best of 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. By _____ Architect's / Engineer's Signature Name & Title _____ Date _____

INSTRUCTIONS • PSCA-funded projects, and State Agency-owned projects: Two copies of pay. app., each with original signatures and all attachments required. • Date of first payment application cannot precede the Notice to Proceed's Begin Date. • Pay. app. must exactly match an attached DCM Form C-10SOV: Schedule of Values. • A change order must be fully executed before inclusion on a payment application. • Contractor's signature date cannot precede the payment application date. • Contractor and Notary signee dates must match. • Progress schedules must be included with non-final payment applications. • One payment application per month may be submitted. • On a final payment application, the following is required for release of retainage: all change orders must be fully executed (signed by all parties and approval authorities) and included in B., the Certificate of Substantial Completion for entire work is fully executed, and all other close-out requirements per General Conditions Article 34 are completed.	APPROVAL _____ Owner Entity By _____ Signature Name & Title _____ Date _____

SCHEDULE OF VALUES (SOV)

DCM Form C-10SOV
Revised October 2021

Project:	DCM (BC) Project Number:
	PSCA Project Number, if any:

Contractor Company:	Application Number:
	Application Date:
	Period From: Period To:

A	B	C	D	E	F	G	H	I	J
Item No.	Description of Work	Scheduled Value (including fully executed [signed by all parties] change order amounts)	Work Completed		Total Work Completed to Date (This application SOV's D + E)	Materials Presently Stored (G total greater than \$0 must match C-10SM's column E total. This SOV's G amounts are not in this SOV's D nor E amounts.)	Total Work Completed to Date & Materials Presently Stored (This SOV's F + G)	Percent of Contract Completed to Date (This SOV's H / C)	Retainage (This column's Total's cell formula calculates the applicable variable rate)
			Work Previously Completed (Previous pay app SOV's column F. D is \$0 if this SOV is for first pay app.)	Work Completed This Period (Period as noted above)					
1.					\$ -		\$ -		Retainage Variable Rate: If Total Work Completed to Date & Materials Presently Stored (H) is less than or equal to 50% of Total Scheduled Value (C), Retainage = $H \times 0.05$. Once H exceeds 50% of C and up until project is complete, Retainage = $C \times 0.025$. There will be no retainage on final payment application.
2.					\$ -		\$ -		
3.					\$ -		\$ -		
4.					\$ -		\$ -		
5.					\$ -		\$ -		
6.					\$ -		\$ -		
7.					\$ -		\$ -		
8.					\$ -		\$ -		
9.					\$ -		\$ -		
10.					\$ -		\$ -		
11.					\$ -		\$ -		
12.					\$ -		\$ -		
13.					\$ -		\$ -		
14.					\$ -		\$ -		
15.					\$ -		\$ -		
16.					\$ -		\$ -		
17.					\$ -		\$ -		
18.					\$ -		\$ -		
19.					\$ -		\$ -		
20.					\$ -		\$ -		
21.					\$ -		\$ -		
22.					\$ -		\$ -		
23.					\$ -		\$ -		
24.					\$ -		\$ -		
25.					\$ -		\$ -		
TOTALS:		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -
This pay app SOV's column totals must match amounts in this pay app Form C-10 per the following indicated Form C-10 line #s:		C.	None	None	1.	2.	3.	3.	4.

Note: If this SOV's column G: Materials Presently Stored includes any amounts other than \$0, then DCM Form C-10SM: Inventory of Stored Materials with back-up receipts must be submitted as part of the payment application documentation.

INVENTORY OF STORED MATERIALS				DCM Form C-10SM Revised October 2021	
Project:			DCM (BC) No.:		
			PSCA No, if any:		
Contractor Company:			For Estimate No.:		
			For Period Ending:		
A	B	C	D	E	
Description	Materials Stored Last Period	Materials Purchased This Period (period noted above)	Materials Used This Period (period noted above)	Materials Presently Stored (B + C - D)	
TOTALS:					
Instructions : · This Form C-10SM must be submitted as part of the payment application documentation when a Materials Presently Stored amount of anything greater than \$0 is noted on line 2 of DCM Form C-10: Application and Certificate for Payment. · Receipts must be provided as attachments to this form C-10SM for all amounts placed in Column C: Materials Purchased This Period. · The total \$ amount of this Form C-10SM's column E: Materials Presently Stored must match both Form C-10's line 2: Materials Presently Stored, and Form C-10SOV: Schedule of Values' total \$ amount of Column G: Materials Presently Stored. · The \$ amounts in this current Form C-10SM's Column D: Materials Used This Period are amounts that must all be included in the current payment application's Form C-10SOV's Column E: Work Completed This Period. · The \$ amounts in this current Form C-10SM's Column E: Materials Presently Stored are the amounts that must be listed in the next payment application's Form C-10SM's Column B: Materials Stored Last Period.					

SAMPLE PROGRESS SCHEDULE & REPORT				CONTRACTOR (Contractor may use own form in lieu of Form C-11):								DATE OF REPORT:							
DCM (BC) No.:												ARCHITECT/ENGINEER:				PROCEED DATE:			
PSCA projects: PSCA No.:																PROJECTED COMPLETION DATE:			
PROJECT:																			
WORK DIVISION		%	AMOUNT																
1.	GENERAL REQUIREMENTS																		
2.	SITEWORK																		
3.	CONCRETE																		
4.	MASONRY																		
5.	METALS																		
6.	WOOD AND PLASTIC														100%				
7.	THERMAL AND MOISTURE PROTECTION														90%				
8.	DOORS AND WINDOWS														80%				
9.	FINISHES														70%				
10.	SPECIALTIES														60%				
11.	EQUIPMENT														50%				
12.	FURNISHINGS														40%				
13.	SPECIAL CONSTRUCTION														30%				
14.	CONVEYING SYSTEMS														20%				
15.	MECHANICAL														10%				
16.	ELECTRICAL														0%				
TOTAL ORIG. CONTRACT		100%																	
ANTICIPATED DRAW IN \$1,000																			
ACTUAL DRAW IN \$1,000																			
LEGEND: ANTICIPATED ACTIVITY												ACTUAL ACTIVITY		ANTICIPATED CASH FLOW		ACTUAL CASH FLOW		USE ADDITIONAL SHEETS IF JOB IS SCHEDULED OVER 12 MONTHS.	

DCM Form C-11
August 2021

(334) 242-4082 (ph), inspections@realproperty.alabama.gov

Date: _____

DCM (BC) #	PSCA #
PROJECT NAME AND LOCATION:	OWNER ENTITY NAME & ADDRESS:
CONTRACTOR COMPANY NAME & ADDRESS:	ARCHITECTURAL/ENGINEERING FIRM NAME & ADDRESS:
Phone No. _____	Phone No. _____
PROJECT DATA ON THE DATE OF OBSERVATION: No. of Workers _____ Site Conditions _____ Weather _____ Starting Date _____ Contract Completion Date _____ Scheduled State of Completion _____% Estimated Actual Completion _____% Contractor's Superintendent _____ Job Phone # _____	
COMMENTS / DEFICIENCIES:	
Signature _____ Report No. _____ cc: Owner, Architect/Engineer, Contractor, DCM Office (inspections@realproperty.alabama.gov), DCM Inspector	

**Alabama Department of Finance
Real Property Management
Division of Construction Management**

770 Washington Avenue, Suite 444
Montgomery, Alabama 36104
(334) 242-4082 (phone)

DCM Form B-12
Revised July 2022

CHANGE ORDER CHECKLIST

For use with DCM Form C-12 and DCM Form 9-J

WHICH FORM DO YOU USE?

Use **DCM Form C-12** for contracts of state agencies and departments and State Department of Education (SDE) projects. Also use for ACCS projects with Notice-to-Proceeds issued prior to August 1, 2021.

Use **DCM Form 9-J** for contracts of projects partially or fully Public School and College Authority (PSCA)-funded, except for ACCS projects with Notice-To-Proceeds issued after July 31, 2021. Include a completed

DCM Form B-11: Change Order Justification with **each copy of** either DCM Forms C-12 or 9-J.

Verify that the following information is inserted in the spaces provided on the CONTRACT CHANGE ORDER form, or attached to the form where attachments are noted to be acceptable or obviously necessary. Do not staple forms; use clips.

1.	CHANGE ORDER NUMBER: Insert current change order number.
2.	DATE: Insert date.
3.	DCM (BC) PROJECT NUMBER: Insert DCM Project Number in the block provided at top of document.
4.	CONTRACTOR Insert name and address of the Contractor, exactly as they appear on the Construction Contract.
5.	NAME OF PROJECT: Under "Project", insert the complete name of the project as identified in the bid documents. If using DCM Form 9-J, insert the PSCA Project Number in the space provided.
6.	CONTRACTOR'S PROPOSALS: Under "TERMS", identify the change order proposals submitted by the contractor that are being addressed by the Contract Change Order. Identify these proposals by inserting their dates.
7.	DESCRIPTION OF THE CHANGE(S) IN WORK: Fully describe the change or changes to the original contract work for which the Construction Contract is being modified. This description should be written so that a reader of the document who is not directly involved in the project can understand what is being changed. If the space provided on the form is inadequate for such a description, use attachments and cite them.
8.	CONTRACT AND CHANGE ORDER AMOUNTS: Insert the applicable dollar amounts to record the original contract sum, change orders, and the currently revised contract sum.
9.	EXTENSION OF TIME: If the Contract Time is being extended by the Contract Change Order, insert appropriate number of calendar days in the space provided. If the Contract Time is not being extended, insert "NONE".
10.	RESPONSIBILITY FOR CHANGE ORDER FUNDING - DCM Form 9-J ONLY: The authority responsible for funding the change order is to be identified in the following sentence in the form, : "The amount of this Change Order will be the responsibility of _____." Insert whichever is appropriate: (1) "PSCA", (2) name of LEA, or (3) "PSCA" and name of LEA.
11.	SIGNATURES: The signature spaces for State Agency, PSCA and fully locally-funded Alabama Community College System projects are different from each other. Download the appropriate document per Owner/project type from www.dcm.alabama.gov/forms.aspx . Before submitting a Contract Change Order to DCM, the document must be signed by the contractor, surety (for additive change orders only), design professional and owner (local owner or using agency). Signature by the surety is not necessary on deductive change orders or change orders involving only extensions of time. If the cumulative change order amount exceeds 10% of the original contract amount then the Owner's legal consultant must sign DCM Form B-11: Change Order Justification.
12.	ATTACHMENTS: To each of the three (3) copies (with original signatures) of the Contract Change Order form, attach with clips (do not staple): a. Contractor's change order proposals and/or invoices providing a detailed breakdown of change order costs. General Contractors (GC) must include subcontractors' (sub) quotes as backup. All GC and sub quotes must be broken down by labor (hours and rates), materials including quantities and unit prices (with receipts or quotes attached), equipment whether rented or owned (with receipts or quotes attached), and Overhead & Profit (OH&P). 1. Total OH&P can be a maximum of 25% divided between GC and subs; GC can have a maximum of 15% OH&P (in which case a sub could have up to 10% OH&P). See General Conditions- Article #19. 2. Sales tax cannot be included in change orders. 3. Deductive change orders also require backup including breakdown of labor and material, and must also deduct OH&P if included in original bid. Include specification section regarding allowances. b. POWER OF ATTORNEY for the individual signing the Contract Change Order for the surety. c. DCM Form B-11, CHANGE ORDER JUSTIFICATION: completed and signed by the design professional and owner.

This form is provided solely for the purpose of inclusion in the project manual. A Construction Contract for fully locally-funded K-12 projects must be initiated via the appropriate DocuSign link from DCM's Engage Portal at <https://engagealabamapm.facilityforce.cloud> by the Lead Design Professional Firm.

DCM Form C-12 (fully locally-funded K-12 school project)
revised October 2024
A Change Order is not valid without an accompanying completed Change Order Justification (DCM Form B-11).

CONTRACT CHANGE ORDER

Change Order No. _____ **Date** _____ **DCM (BC) No.** _____

TO: (Contractor) Co. Name: Address:	PROJECT:

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. If the description is continued in an attachment, identify the attachment below; only use an attachment if fields below become full.):*

Description continued from Page 1:

ORIGINAL CONTRACT SUM	\$	_____
NET TOTAL OF PREVIOUS CHANGE ORDERS	\$	_____
PREVIOUS REVISED CONTRACT SUM	\$	_____
THIS CHANGE ORDER WILL INCREASE DECREASE		
THE CONTRACT SUM BY	\$	_____
REVISED CONTRACT SUM, INCLUDING THIS CHANGE ORDER	\$	_____

EXTENSION OF TIME resulting from this Change Order None or _____ Calendar days.

The Owner does hereby certify that this Change Order was executed in accordance with the provisions of Title 39, Code of Alabama, 1975, as amended.

Architectural/Engineering Firm
Recommended By _____
Name & Title _____

APPROVAL

ALABAMA STATE DEPARTMENT OF EDUCATION
(SDE)
(Required for locally-funded, SDE projects.)

By _____	Date: _____
State Superintendent of Education	

CONTRACTING PARTIES	

Contractor Company	
By _____	
Name & Title _____	

Awarding Authority/Owner Entity	
By _____	
Name & Title _____	
CONSENT OF SURETY (for additive \$ change orders only)	

Surety Company	
By _____	
(Attach current Power of Attorney)	
Name & Title _____	

Routing of the Construction Contract to reviewers and e-signers is automated through DocuSign. DocuSign links for fully locally-funded contract documents are available from DCM's Engage Portal at <https://engagealabama-rpm.facilityforce.cloud>

TO: **Alabama Department of Finance**
Real Property Management
Division of Construction Management
 770 Washington Avenue, Suite 444
 Montgomery, Alabama 36104
 (334) 242-4082 FAX (334) 242-4182

CHANGE ORDER JUSTIFICATION

Change Order No. _____

Date: _____

DCM (BC) No. _____

Purpose and instructions on next page.

Do not staple this form and/or attachments; use clips.

(A)	PROJECT NAME & LOCATION:	OWNER ENTITY NAME & ADDRESS:						
	CONTRACTOR COMPANY NAME & ADDRESS:	ARCHITECTURAL / ENGINEERING FIRM NAME & ADDRESS:						
(B)	DESCRIPTION OF PROPOSED CHANGE(S): ATTACH CONTRACTOR'S DETAILED COST PROPOSAL(s)							
	AMOUNT: ☐ ADD ☐ DEDUCT \$ _____ TIME EXTENSION: _____ CALENDAR DAYS							
(C)	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">ORIGINAL CONTRACT AMOUNT</td> <td style="width: 33%;">PREVIOUS C.O.'s _____ THRU _____</td> <td style="width: 34%;">CONTRACT AMOUNT PRIOR TO PROPOSED CHANGE ORDER</td> </tr> <tr> <td>\$ _____ + \$ _____</td> <td>=</td> <td>\$ _____</td> </tr> </table>		ORIGINAL CONTRACT AMOUNT	PREVIOUS C.O.'s _____ THRU _____	CONTRACT AMOUNT PRIOR TO PROPOSED CHANGE ORDER	\$ _____ + \$ _____	=	\$ _____
ORIGINAL CONTRACT AMOUNT	PREVIOUS C.O.'s _____ THRU _____	CONTRACT AMOUNT PRIOR TO PROPOSED CHANGE ORDER						
\$ _____ + \$ _____	=	\$ _____						
(D)	JUSTIFICATION FOR NEED OF CHANGE(S):							
(E)	JUSTIFICATION OF CHANGE ORDER vs. COMPETITIVE BID:							
(F)	ARCHITECT / ENGINEER'S EVALUATION OF PROPOSED COST:							
(G)	CHANGE ORDER RECOMMENDED _____ ARCHITECTURAL / ENGINEERING FIRM NAME By: _____ ARCHITECT / ENGINEER'S SIGNATURE By: _____ OWNER'S PROJECT REPRESENTATIVE'S SIGNATURE	CHANGE ORDER JUSTIFIED AND APPROVED _____ LOCAL OWNER ENTITY NAME By: _____ OWNER'S SIGNATURE By: _____ OWNER'S LEGAL COUNSEL'S SIGNATURE						

CHANGE ORDER JUSTIFICATION: PURPOSE and INSTRUCTIONS

PURPOSE

The awarding of work through an existing contract may potentially conflict with, or violate, the "Competitive Bid Laws" of the State of Alabama. **The determination of legality of Change Orders rests with the Awarding Authority and its legal advisor.** In a June 15, 1979, Opinion, the Office of the Attorney General offered guidelines for making such determinations in conjunction with considering the facts and merits of each situation. The purpose of the CHANGE ORDER JUSTIFICATION is to provide a means through which the Awarding Authority considers these guidelines and the intent of the "Competitive Bid Laws" when authorizing Change Orders. Pursuant to these guidelines, the following types of changes meet the criteria for awarding work through Change Orders in lieu of through the Competitive Bid process:

- I. Minor Changes for a monetary value less than required for competitive bidding.
- II. Changes for matters relatively minor and incidental to the original contract necessitated by unforeseeable circumstances arising during the course of the work.
- III. Emergencies arising during the course of the work of the contract.
- IV. Bid alternates provided for in the original bidding where there is no difference in price of the change order from the original best bid on the alternate.
- V. Changes of relatively minor items not contemplated when the plans and specifications were prepared and the project was bid which are in the public interest and which do not exceed 10% of the contract price.

Under these guidelines the cumulative total of Change Orders, including any negotiations to bring the original contract price within the funds available, would become questionable if the total of such changes and negotiations exceed 10% of the original contract price. These guidelines are not intended to interfere with the Awarding Authority's good faith discretion to respond to specific situations in the public's best interest. If the cumulative change order amount exceeds 10% of the original contract amount then the Owner's legal consultant must sign the Change Order Justification prior to submission to the Division of Construction Management (DCM).

INSTRUCTIONS

The CHANGE ORDER JUSTIFICATION is to be prepared by the design professional, who has evaluated the fairness and reasonableness of the proposed cost of the change(s) and recommends that the proposed Change Order be executed. The fully executed Form B-11: CHANGE ORDER JUSTIFICATION must accompany the proposed DCM Form C-12: Change Order. Instructions for completing the B-11 form are:

1. Insert the proposed Change Order Number, date of the Justification, and DCM (BC) Project Number in the spaces provided in the upper right-hand corner.
2. **Section (A):** Insert the complete name and address of the PROJECT, OWNER, CONTRACTOR, AND ARCHITECT/ENGINEER.
3. **Section (B):** Provide a complete description of the proposed changes in work, referring to and attaching revised specifications and/or drawings as appropriate. An attachment may be used if additional space is needed, but insert the proposed amount and time extension of the change(s) in the spaces provided. **Attached a copy of the contractor's detailed cost proposal.**
4. **Section (C):** Insert the Original Contract amount, the net increase or decrease of previous Change Orders, and the Current Contract amount (preceding the currently proposed Change Order).
5. **Section (D):** Explain why it is necessary, or in the public's interest, to make the proposed change(s) to the Work.
6. **Section (E):** Explain why award of the changed work to the existing contractor instead of awarding the work under the competitive bid process is justified.
7. **Section (F):** The design professional must state his evaluation of the reasonableness and fairness of the proposed costs based upon his review of the contractor's proposal.
8. **Section (G):** The design professional must recommend the Change Order to the Owner by signing the document; the Owner may require such recommendation from other individuals. The Owner must sign the document indicating that they believe change order action in lieu of the competitive bid process is justified for the proposed change(s). **Review of the matter and signing of the document by the Owner's legal counsel is highly recommended. If the cumulative change order amount exceeds 10% of the original contract amount then the Owner's legal consultant must sign the Change Order Justification prior to submission to DCM.**

CHANGE PROPOSAL RECAP SHEET

Project Name : _____

Date : _____

Arch# Project Number : _____

Contractor Name : _____

Initiated By : Owner/Architect ☐(Check One) Contractor ☐Subcontractor ☐

Reference Change Proposal Request Number : _____

Brief Description of Proposed Change : _____

GENERAL CONTRACTOR Direct Cost Summary (Attach Supplemental Sheets as necessary)

Item / Description *	Quantity	Unit	Amount				Unit \$	Equipment
			Unit \$	Material	Unit \$	Labor		
Sub Totals :			\$	-	\$	-	\$	-
Material :	\$	-						
Labor :	\$	-						
Equipment :	\$	-						
General Contractor Subtotal :	\$	-						

SUBCONTRACTOR Direct Cost Summary (Attach Supplemental Sheets as necessary)

Item / Description *	Quantity	Unit	Amount						Unit \$	Sub-sub
			Unit \$	Material	Unit \$	Labor	Unit \$	Equipment		
Sub Totals :			\$	-	\$	-	\$	-	\$	-
Material :	\$	-								
Labor :	\$	-								
Equipment :	\$	-								
Sub-sub :	\$	-								
Subcontractor Subtotal :	\$	-								

UNIT PRICE Cost Summary (Attach Supplemental Sheets as necessary)

Item / Description *	Quantity	Unit	Amount	
			Unit \$	Total Unit Price
Sub Totals :			\$	-
Unit Price Subtotal :	\$	-		

Mark-up Calculations

Subcontractors Subtotal :	\$	-	
General Contractor Subtotal :	\$	-	
Unit Price Subtotal :	\$	-	
TOTAL Direct Cost :	\$	-	
** General OH&P on Own Work :	\$	-	15% Amount not to exceed 15%, see Article 19 of the General Conditions
** Total OH&P on Sub Work :	\$	-	25% Amount not to exceed 25%, see Article 19 of the General Conditions

TOTAL COST CHANGE \$ - Add ☐
Deduct ☐

*** TOTAL TIME CHANGE _____ Calendar Days (Critical paths impact only)

* Materials permanently installed in the building shall be sales tax free.

** "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.

*** Any requests for additional time are only considered if the critical path of the project is extended. Attach additional pages with explanation of how the change affects the critical path of the project.

CERTIFICATE OF SUBSTANTIAL COMPLETION

ROUTING PROCEDURES ON NEXT PAGE

DCM (BC) No. _____

OWNER ENTITY NAME AND ADDRESS: Email to receive executed copy: _____	ARCHITECTURAL / ENGINEERING FIRM NAME AND ADDRESS: Email to receive executed copy: _____
CONTRACTOR COMPANY NAME AND ADDRESS: Email to receive executed copy: _____	BONDING COMPANY NAME AND ADDRESS: Email to receive executed copy: _____
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 one (1) originally executed substantial completion form shall be routed for signature. DCM office will mail the fully-executed original to the Owner and email copies to all parties.

RECOMMENDED BY <i>(signature and email address required):</i> ARCHITECT/ENGINEER: _____ CONTRACTING PARTIES: CONTRACTOR: _____ OWNER: _____ APPROVALS: DCM INSPECTOR: _____ DCM CHIEF INSPECTOR: _____ DCM DIRECTOR: _____	DATE: _____ DATE: _____ DATE: _____ DATE: _____ DATE: _____ DATE: _____ DATE: _____

CERTIFICATE OF SUBSTANTIAL COMPLETION ROUTING PROCEDURE

Only one (1) substantial completion form shall be routed for e-signatures, via DocuSign link from DCM's Engage Portal at: <https://engagealabama-rpm.facilityforce.cloud>

NOTICE

THE EXECUTED “GENERAL CONTRACTOR’S ROOFING GUARANTEE” (DCM Form C-9) AND ANY OTHER ROOFING WARRANTY REQUIRED BY THE CONTRACT MUST ACCOMPANY THIS CERTIFICATE TO OBTAIN DCM APPROVAL.

Also, any standard manufacturer's roofing guarantees which contain language regarding the governing of the guarantee by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such guarantees.

FINAL PAYMENT CHECKLIST (FPC)

To be completed by the Architect/Engineer and submitted to DCM for review *via the correct DocuSign link from the Engage Portal*; applicable only to state agencies, partially or fully PSCA-funded and other bond-funded projects. The FPC shall include all attachments including the Contractor's Application for Final Payment. If all PSCA funds are expended prior to Final Payment, it is not a requirement to submit the Application & Certificate for Final Payment along with the supporting documentation to DCM.

(For further guidance refer to Article 34/Final Payment of DCM Form C-8: General Conditions of the Contract.)

PROJECT:		DCM No. _____ PSCA No. _____ (If applicable)
YES	N/A	Select "YES" or "N/A" as applicable.
☐	☐	Application and Certificate for Final Payment, DCM Form C-10: Attach one copy to FPC. The application must include original signatures of all parties and include all application attachments.
☐	☐	Certificate of Substantial Completion, DCM Form C-13: Attach one fully-executed copy to FPC.
☐	☐	Affidavit of Advertisement for Completion: Attach one copy of the affidavit of publication, including the image of the advertisement which may be based on DCM Form C-14, to the FPC. An affidavit is a legal document issued by the publisher, which must be requested from the publisher.
☐	☐	Contractor's Affidavit of Payment of Debts & Claims, DCM Form C-18: Attach one copy to FPC.
☐	☐	Contractor's Affidavit of Release of Liens, if required by Owner, DCM Form C-19: Attach one copy to the FPC.
☐	☐	Consent of Surety to Final Payment, if any, To Contractor, DCM Form C-20: Consent is required for projects with P&P Bonds. Original has been delivered to Owner. Attach one copy to FPC.
☐	☐	General Contractor's Roofing Guarantee, DCM Form C-9, and Other Specified Roofing Guarantees, if any: Attached to Certificate of Substantial Completion.
☐	☐	Contractor's One-Year Warranty: Original has been delivered to the Owner. Attach one copy to the FPC.
☐	☐	Other Warranties: All other specified original warranties has been delivered to the Owner. Attach one copy to the FPC.
☐	☐	Record Documents: Specified "As-built" plans and specifications have been delivered to the Owner.
☐	☐	O & M Manuals: Specified instructions and O&M Manuals have been delivered to the Owner.
☐	☐	Time Extension: Over-run of Contract Time has been reconciled by: ☐ Change Order ☐ Liquidated Damages ☐ Attached explanation
☐	☐	Additional Documents or Explanations which are attached:
Submitted By: _____ Architectural / Engineering Firm _____ Signature _____ Printed Name and Title _____ Date		

Final Reconciliation of Fees: Between the final change order execution and the year-end inspection, report the final project cost to the Engage Portal at <https://engagealabama-rpm.facilityforce.cloud> (back-up is not needed unless requested by DCM). DCM will then email a Final Reconciliation of Fees Statement to the Owner. If the Final Statement shows a net payment is owed to DCM, that amount must be paid prior to scheduling the year-end inspection. If the Final Statement shows a net refund is owed then a check will be mailed to the Owner.

DCM (BC) Number: _____

PSCA Projects: PSCA Number: _____

Date of the Construction Contract: _____

Contractor's Affidavit of Payment of Debts and Claims

To Owner (<i>Entity name and address</i>): 	Project (<i>Same as appears in the Construction Contract</i>):

STATE OF:

COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Construction Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

Supporting Documents Attached Hereto:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. DCM Form C-20, Consent of Surety to Final Payment, may be used for this purpose.

Indicate attachment: ☐ Yes ☐ No

The following supporting document should be attached hereto if required by the Owner:

1. Contractor's Release of Waiver of Liens.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment supplies, to the extent required by the Owner, accompanied by the list thereof.
3. Contractor's Affidavit of Release of Liens, DCM Form C-19.

Contractor (*Insert company name and address*):

By: _____
Signature of authorized representative

Name and Title

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

Notary Public's Signature

My commission expires: _____

Seal:

DCM (BC) Number: _____

PSCA Projects: PSCA Number: _____

Date of the Construction Contract: _____

Contractor's Affidavit of Release of Liens

To Owner (<i>Entity name and address</i>):	Project (<i>Same as appears in the Construction Contract</i>):

STATE OF:

COUNTY OF:

The undersigned hereby certifies that, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Construction Contract referenced above.

EXCEPTIONS:

Supporting Documents Attached Hereto:

1. Contractor's Release of Waiver of Liens.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment supplies, to the extent required by the Owner, accompanied by the list thereof.

Contractor (*Insert company name and address*):

By: _____
Signature of authorized representative

Name and Title

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

Notary Public's Signature

My commission expires: _____

Seal:

DCM (BC) Number: _____

PSCA Projects: PSCA Number: _____

Date of the Construction Contract: _____

Surety's Bond Number: _____

CONSENT OF SURETY TO FINAL PAYMENT

To Owner (<i>Entity name and address</i>): 	Project (<i>Same as appears in the Construction Contract</i>):

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the

Surety (*Insert name and address of Surety*)

on bond of

Contractor (*Insert name and address of Contractor*)

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its obligations to

Owner (*Insert name and address of Entity*):

as set forth in said Surety's bond.

SIGNED AND SEALED this _____ day of _____, _____.

SURETY:

Seal:

Company Name

By _____
Signature of Authorized Representative

Printed Name and Title

Note: Original Power of Attorney for the Surety's signatory shall be furnished with each of the original forms to be attached to each of the four (4) final payment forms.

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 _____,
(Contractor Company Name)

Contractor, has completed the Contract for ☐ (Construction) ☐ (Renovation) ☐ (Alteration)
☐ (Equipment) ☐ (Improvement) of _____
(Name of Project):

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 / Engineer)

(Contractor)

(Business Address)

NOTE: This notice must be run for a minimum of three weeks for projects of \$100,000.00 or more. For acceptable methods of advertisement, see General Conditions of the Contract, Article 34. Proof of publication of the notice shall be made by the contractor to the authority by whom the contract was made by affidavit of the publisher or website owner and a printed copy of the notice published. A final settlement shall not be made upon the contract until the expiration of 30 days after the completion of the notice.

CERTIFICATE OF ASBESTOS FREE BUILDING MATERIALS

The undersigned hereby states that all building materials incorporated, installed, and used during the construction process for the below listed project by the Contractor or its Subcontractors of any tier are 100% asbestos free. **Asbestos Free means containing 0% asbestos in any form.** Refer to Section 01600, Product Requirements.

McKee Project Name: _____

McKee Project Number: _____

CERTIFICATION: The undersigned certifies that he or she is authorized to execute contracts and legal documents on behalf of the General Contractor as legally named, that this certification is submitted in good faith without fraud or collusion with any other person, that the information indicated in this document is true and complete, and that the document is made in full legal agreement.

To: _____
(Owner / Awarding Authority of Construction Contract)

Date _____

Legal Name of General Contractor _____

General Contractor State License No. _____
(Exactly as appears on license including designation letters)

General Contractor Mailing Address _____

By (Legal Signature) _____

Name & Title (print) _____

Telephone Number _____

E-Mail Address _____

SECTION 01010 - SCOPE OF THE WORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS AND GENERAL INFORMATION

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 specification sections apply to the work of this section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Type of the Contract.
 - 2. Work Under This Contract.
 - 3. **Completion Times.**
 - 4. Division of Construction Management User Fees.
 - 5. Project Work Identification.
 - 6. Owner-furnished products.
 - 7. Supervision.
 - 8. Contractor Use of premises.
 - 9. Definitions.
 - 10. Work Under Other Contracts.
 - 11. Building and Site Construction.
 - 12. General Issues.
 - 13. Temporary Electrical Power and Jobsite Utilities.
 - 14. Site Security and Insurance Requirements.
 - 15. Protection of Work in Place.
 - 16. Work restrictions.
 - 17. Owner's occupancy requirements.
 - 18. Specification formats and conventions.
- B. Related Sections include the following:
 - 1. Division 1 Section 01500 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 TYPE OF CONTRACT

- A. Construction Contract (DCM Form C-5).

1.4 WORK UNDER THIS CONTRACT

- A. Sealed Proposal shall be received as follows:
 - 1. One (1) Sealed Envelope MUST include the following:
 - a. General Contractor's Name and State General Contractor's License number MUST be legible on the front of the envelope.
 - b. One (1) Bid Proposal for all work as indicated on drawings and specifications.
 - c. Unit Price Attachment Sheet MUST be included if document is included in the project manual.
 - d. One (1) Bid Bond or certified check.

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- e. One (1) Sales Tax Form.

1.5 COMPLETION TIMES

- A. **Work on the interior of the existing classroom building shall begin with Notice to Proceed. Work in the front office area and entrance vestibules shall be completed by August 3, 2026. Work in the existing library area shall be completed by October 30, 2026.**
- B. **The Cafeteria-Kitchen building and associated sitework (except concrete walks on the north and west sides) shall begin with Notice to Proceed and be completed by May 21, 2027.**
- C. **Construction of the exterior work at the front of the school (sitework, walkways, etc.) and concrete walkways on the north and west sides of the new cafeteria-kitchen building shall begin on June 1, 2027, and be completed by August 3, 2027.**

1.6 DIVISION OF CONSTRUCTION MANAGEMENT USER FEES & OTHER FEES

- A. The Contractor **MUST Include** all costs for permits and fees per the General Conditions of the Contract DCM Form C-8; Article 44 "Permits, Laws and Regulations", Paragraph A Permits, Fees and Notices Sub Paragraphs (1) and (2).
- B. The Contractor shall be responsible for all "Re-Inspection Fees".
 - 1. If the contractor schedules an inspection and it is determined by the Owner, Architect or Owner Representative that the contractor has not met required benchmarks or the inspection is cancelled without 48-hours' notice, the Owner, Architect or Owner Representative shall require a fee of \$1500. This additional inspection fee shall be applied to each additional inspection that is required to be rescheduled.

1.7 PROJECT / WORK IDENTIFICATION

- A. General: Project name is as indicated in the Advertisement For Bids and as shown on the Contract Documents prepared by Lathan Mckee, 631 S. Hull Street Montgomery, Alabama 36104.
- B. Contract Documents: Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not limited to the following:
 - 1. Existing site conditions and restrictions on use of the site including ingress and egress to the site.
 - 2. Grading operations at the site.
 - 3. The Contractor shall be responsible to secure the site during the execution of the work and provide proof of insurance including but not limited to General Liability, W/C, Auto, Equipment, etc.
- C. Summary by References: Work of the Contract can be summarized by references to the Contract, General Conditions, Supplementary Conditions, the Project Manual, Technical Specification Sections, Drawings, Addenda and modifications to the Contract Documents issued subsequent to the initial printing of this Project Manual and the Drawings, and including but not necessarily limited to, printed material referenced by any of the above. It is recognized that the Work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions, and other forces outside the contract documents.

1.8 OWNER FURNISHED PRODUCTS

- A. None

1.9 SUPERVISION

- A. Supervision: The Contractor shall provide adequate supervision of the project to ensure proper supervision for all work.

1.10 CONTRACTOR USE OF PREMISES

- A. General: During the entire cleanup period the Contractor shall have the exclusive use of the premises for cleanup operations, including full use of the site as shown on the Drawings.
- B. Limitations of exclusive use of the site:
 - 1. Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to applicable rules and regulations affecting the work while engaged in project performance. See site plan for ingress and egress to the site, or if not indicated, same shall be as designated by the Architect.
 - 2. Keep existing public roads, driveways and entrances serving the premises clear and available at all times. Do not use these areas for parking or storage of materials. Remove dirt, mud, debris, etc., from site, sidewalks, streets, and public right-of-way as it occurs.
 - 3. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds and or designated storage areas as indicated.
 - 4. Lock automotive type vehicles, such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place.
 - 5. The Owner, and their representatives, the Architect and their Consultants, as well as authorities having jurisdiction will require site accessibility for inspections, observations, and perhaps other purposes, related to the planned new construction. All Contractors shall assist in such accessibility, to at least the point of providing and maintaining accessible dry paths to work in progress.
 - 6. Furnish and install by contractor temporary barricades, fencing, etc., as indicated or otherwise required, to restrict pedestrian and vehicular traffic from construction operations, including in part, Owner's staff, the public, students, children, and residents of the adjacent residential neighborhoods.
 - 7. Construction operations shall not affect in any manner, the on-going operations of the Owner, immediately adjacent facilities, adjacent property owners or businesses, or others. Refer to Division 1 Section "Special Conditions" for additional information and requirements regarding coordination with Owner's activities, etc.
 - 8. Construction equipment shall not come in contact with or swing over existing facilities to remain, public areas, occupied buildings, right-of-ways, etc., which are to remain.
 - 9. All contractors and their employees shall limit any discussion of the Work of this project to the Owner's representatives named in the front of this Project Manual, Consultants employed, inspecting authorities with jurisdiction, and the Architect. In no instance shall this project be discussed with others, except as may otherwise be indicated herein.
 - 10. Parking on-site, if any, shall be limited to the "staging areas" indicated on the Drawings, or if not indicated, as mutually agreed between the Architect and Contractor at the Pre-Construction Conference.
 - 11. Smoking or other use of tobacco products shall not be permitted within the structure of the Building, Owner's facilities or on roofs.
 - 12. The use or presence of alcohol and/or other debilitating substances shall not be permitted in the construction of the building and or on the project site.
 - 13. Firearms and/or other weapons shall not be permitted on the project site.
 - 14. The Contractor shall furnish necessary temporary toilets for all work forces on the job site.

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PART 2 - SCOPE OF THE WORK

2.1 DEFINITIONS

- A. The Scope of the Work of the Contract is meant to be viewed as a successor to the General Special Conditions of the Contract. Should any discrepancy or ambiguity be noted, the Scope of the Work of the Contract shall apply and the General Special Conditions of the Contract shall defer to Scope of the Work of the Contract Documents. The scope of the work shall be taken in its entirety by all contractors. In signing the contract all contractors have read and understand that the Scope of the Work and the General Special Conditions are taken in their entirety.
 - 1. The term "Design Consultant" shall be construed to mean "Architect".
 - 2. The terms "Owner" shall mean "Baldwin County Public Schools".

2.2 WORK UNDER OTHER CONTRACTS

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.
- B. Concurrent Work: Owner will award separate contract(s) for the following construction operations at the Project site. Those operations will be conducted simultaneously with work under this Contract.
 - 1. Work done by others or by Owner.
 - a. Any items noted N.I.C.
 - b. Construction Testing as defined in applicable sections of the project manual.

2.3 BUILDING AND SITE CONSTRUCTION

- A. The Contractor shall maintain the entire site, provide dust control and keep the streets clean at all times and or as directed by the Architect. The Contractor shall call for and be responsible for the locating of all utilities prior to start of work. Use extreme care when working in close proximity to the existing water lines to prevent movement and damage to the water lines.
- B. The Contractor shall install and or replace all fencing including furnish and install all temporary fencing as required for all work including safety barriers, signs, traffic directional signals, temporary stripping, flagman, temporary road plates and any temporary roads around any obstruction and or work being constructed. The Contractor shall make all provisions to keep the public and or temporary access roads open during the duration of the work.
- C. The Contractor shall maintain & level, all temporary roads and temporary lay down and storage areas using same stone base material. Roads must have no potholes, dips, or rises and provide access to and from the site and other locations on site. The Contractor shall maintain the temporary roads used to move material on the site. Temporary roads are existing and the Contractor shall maintain these temporary roads throughout the duration of construction activity while Contractor is onsite.

2.4 GENERAL ISSUES

- A. The Contractor shall be responsible for their own on-site safety requirements within the site per OSHA regulations.
- B. Only an approved company owned and insured vehicle shall be allowed on to the construction site. Vehicles shall be clearly marked and identified with the company logo and or name.

2.5 TEMPORARY ELECTRICAL POWER AND JOBSITE UTILITIES

- A. The Contractor is responsible for the all costs associated with temporary electrical requirements for performance of the work. The Contractor shall be responsible for the all costs associated with temporary water required for the performance of the work. The Contractor is responsible for all other utility costs as required for the performance of the work.

2.6 SITE SECURITY / INSURANCE REQUIREMENTS

- A. The Contractor shall have care custody and control of the site. Contractor shall be responsible for the replacement of their material, equipment and any loss of such. Contractor shall be responsible for securing all material and equipment. If there is a loss and or damage of material and equipment, that loss shall go against the Contractor's insurance coverage.

2.7 PROTECTION OF WORK IN PLACE

- A. The Contractor shall protect all completed work and any rework shall be the responsibility of the contractor **at** no additional cost to the owner.

2.8 WORK RESTRICTIONS

- A. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect and Owner not less than two days in advance of the proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Architect's and Owner's written permission.
- B. Nonsmoking Building: Smoking and smokeless tobacco will not be permitted within the new construction after floor slabs are poured.

2.9 OWNER'S OCCUPANCY REQUIREMENTS

- A. Owner Occupancy: Owner will occupy adjacent parking lots during entire construction period. Cooperate with Owner during construction operations adjacent to or near the existing building and parking to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits, unless otherwise indicated.
- B. Maintain access to existing walkways and other adjacent occupied or used facilities. Do not close or obstruct walkways or other occupied or used facilities without written permission from Owner and authorities having jurisdiction. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
- C. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to place and install equipment in completed areas of building, before Substantial Completion, provided such does not interfere with completion of the Work. Such placement of equipment shall not constitute acceptance of the total Work.

2.10 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format numbering system.
 - 1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
- B. 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. Abbreviated Language: Language used in the Specifications another Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor.

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Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

- a. 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.

PART 3 - NOT APPLICABLE

END OF SECTION

SECTION 01011 - CONTINGENCY ALLOWANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS AND GENERAL INFORMATION

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and other Division 1 specification sections apply to the work of this section.

PART 2 - CONTINGENCY ALLOWANCES

2.1 BASE BID PROPOSAL

- A. The General Contractor shall include the following sums:
 - 1. **One Hundred Thousand Dollars (\$100,000.00)** as a contingency to cover unforeseen conditions or minor changes that are necessary to correct or supplement the work as detailed in the Contract Documents.
 - 2. **Five Hundred Thousand Dollars (\$500,000.00)** as a contingency to cover furnishings.
 - 3. **Wind Damage Deductible-** as a contingency. See Supplement to General Conditions of the Contract; **Article 37, 2.**

- 2.2 The Contractor shall include in his bid proposal(s) all costs of office, job supervision, overhead, profit, and bond on these Contingency Allowances, because no such costs will be paid to Contractor for work performed under these Contingency Allowances. Only the direct costs of performing work under this provision shall be paid under and charged against the Contingency Allowance; such cost includes costs of materials and delivery, installation labor, payroll taxes and insurance, equipment expense, and the cost of subcontracted work (subcontractor's cost may include a maximum of 15% mark-up for overhead and profit).

PART 3 – AUTHORIZATION OF CONTINGENCY ALLOWANCES

- 3.1 After unknown conditions are identified and examined and the scope of work and method of repair determined, or request for a proposal to cover additional work has been issued by the Owner, the Contractor shall submit a proposal for such work to the Architect for the Owner's approval. If the Owner approves of such proposal, he will issue written authorization to the Contractor to perform the work and charge the related costs to the Contingency Allowance. At the Owner's option, work performed under this provision may be ordered done on a time and material basis, in which case; the Contractor shall keep accurate records of all time and materials used and submit such records to the Architect for his approval at the end of each day's work.
- 3.2 An accounting of the costs charged against this Contingency Allowance shall be mutually maintained by the Contractor, Architect, and Owner throughout the course of the project. Any of this Contingency Allowance not spent shall be credited to the Owner by Change Order at close out of the project. Refer to Contingency Allowance Form attached to this Section.
- 3.3 Provide for payment.
 - A. The Contractor shall include a line item in the *Schedule of Values* entitled "Contingency Allowance". The estimated value of work completed pursuant to fully executed Contingency Allowance Authorizations may be included in the Contractor's monthly Applications for Payment. Payments under this Contingency Allowance shall not exceed the net, total of fully executed Contingency Allowance Authorizations.

3.4 CONTINGENCY ALLOWANCE AUTHORIZATION FORM

Form to be filled in its entirety.

To: Lathan Mckee, Architects From: _____
Project: _____ Company _____
_____ Address _____
_____ Contact and Email _____
Project Number _____ Date: _____
Building Commission Number: _____ Authorization Number: _____

In accordance with Specification Section 01011 – CONTINGENCY ALLOWANCE, the Contractor [] is hereby authorized to proceed with the changes in Work as are described below and is to be paid for the performance of these changes as provided in Specification Section 01011. This Authorization shall become effective when it is signed by the Contractor and the Owner's representative and it is understood and agreed that the amount(s) stipulated below constitute full compensation for these changes in Work.

TOTAL AMOUNT OF THIS AUTHORIZATION \$

ORIGINAL AMOUNT OF THE CONTINGENCY ALLOWANCE \$
NET TOTAL OF PREVIOUS AUTHORIZATIONS \$
PREVIOUS REMAINING CONTINGENCY ALLOWANCE \$
TOTAL AMOUNT OF THIS AUTHORIZATION \$
CONTINGENCY ALLOWANCE REMAINING
AFTER THIS CONTINGENCY \$

Recommended By: _____ Authorized By: _____ Accepted By: _____
Architect _____ Owner _____ Contractor _____

END OF SECTION

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SECTION 01250 - CONTRACT MODIFICATION PROCEDURES

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 handling and processing Contract modifications.
- B. Related Sections include the following:
 - 1. Section 01600 "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, that may or may not involve an adjustment to the Contract Sum or the Contract Time, as an Architect's Supplemental Instructions, "ASI".

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time in the form of an ASI. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. ASIs issued by Architect, if adjustments to contract sum or contract time are involved, are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in ASI after receipt of ASI, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Include data as needed to validate material costs
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Architect.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Change Order, Architect will issue a Change Order for signatures as required.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive, "CCD": Architect may issue a Construction Change Directive. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Construction Change Directive contains a complete description of change in the Work.

PART 2 – NOT APPLICABLE

PART 3 – NOT APPLICABLE

END OF SECTION

SECTION 01290 - 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 1 Specification Sections apply to this Section.

1.2 SUMMARY

- A. This Section specifies 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. **At the discretion of the Architect, the contractor shall provide separate Schedule of Values for work on projects involving multiple locations, campuses, sites, buildings etc. and/or multiple scopes of work. Additional line items may be required within each separate Schedule of Values (i.e. separate line items for multiple buildings located on same site).**
- B. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
 - 1. Correlate 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. Submittals Schedule.
 - c. 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.
- C. Format and Content: Use the 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. Submit draft of ABC Form C-11.
 - 3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.

- f. Change Orders (numbers) that affect value.
 - g. Dollar value.
 - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
 5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 6. Provide a separate listing on Application and Certificate for Payment (Standard ABC Form C-10) 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. Include evidence of insurance or evidence of bonded warehousing.
 7. 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.
 8. Unit Costs: Provide a separate line item in the Schedule of Values for each unit cost. Line-item to show 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.
 9. 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.
 - 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.
 10. 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 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: Progress payments shall be submitted to Architect by the 25th of the month. The period covered by each Application for Payment is one month, ending on the 23rd of the month.
- C. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders issued before last day of construction period covered by application only after all agency approvals.
- D. Transmittal: Submit 6 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.

- E. 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. Contractor's Construction Schedule (preliminary if not final).
 4. Products list.
 5. Schedule of unit prices.
 6. Submittals 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.
- F. Application for Payment at Substantial Completion: After issuing 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 Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- G. Final Payment Application: 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. Certificate of Substantial Completion (Standard ABC Form C-13, August 2001)
 5. Form of Advertisement for Completion (Standard ABC Form C-14, August 2001)
 6. Evidence that claims have been settled.
 7. 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.
 8. Final, liquidated damages settlement statement.

PART 2 – NOT APPLICABLE

PART 3 – NOT APPLICABLE

END OF SECTION

SECTION 01320 - 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 1 Specification Sections apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Submittals Schedule.
 - 3. Daily construction reports.
 - 4. Material location reports.
 - 5. Field condition reports.
 - 6. Special reports.
- B. Related Sections include the following:
 - 1. Division 1 Section 01290 "Payment Procedures" for submitting the Schedule of Values.
 - 2. Division 1 Section 01310 "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
 - 3. Division 1 Section 01330 "Submittal Procedures" for submitting schedules and reports.
 - 4. Division 1 Section 01322 "Photographic Documentation" for submitting construction photographs.
 - 5. Division 1 Section 01400 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 SUBMITTALS

- A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
 - 1. Scheduled date for first submittal.
 - 2. Specification Section number and title.
 - 3. Submittal category (action or informational).
 - 4. Name of subcontractor.
 - 5. Description of the Work covered.
 - 6. Scheduled date for Architect's final release or approval.
- B. Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
- C. Daily Construction Reports: Submit two copies at weekly intervals.
- D. Material Location Reports: Submit two copies at monthly intervals.
- E. Field Condition Reports: Submit two copies at time of discovery of differing conditions.
- F. Special Reports: Submit two copies at time of unusual event.
- G. Pre-scheduling Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures

related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Verify availability of qualified personnel needed to develop and update schedule.
2. Discuss any constraints.
3. Review time required for review of submittals and re-submittals.
4. Review requirements for tests and inspections by independent testing and inspecting agencies.
5. Review time required for completion and startup procedures.
6. Review and finalize list of construction activities to be included in schedule.
7. Review submittal requirements and procedures.
8. Review procedures for updating schedule.

1.4 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 1. Secure time commitments for performing critical elements of the Work from parties involved.
 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 2. Initial Submittal: Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. 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.
- C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
 1. Activity Duration: Define activities so no activity is longer than 30 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 60 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 re-submittal times indicated in Division 1 Section 01330 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 4. Startup and Testing Time: Include not less than 14 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.
- D. Constraints: Include constraints and work restrictions, if any, and show how the sequence of the Work is affected.
- E. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.
1. Refer to Division 1 Section 01290 "Payment Procedures" for cost reporting and payment procedures.
 2. Contractor shall assign cost to construction activities on the CPM schedule. Costs shall not be assigned to submittal activities unless specified otherwise but may, with Architect's approval, be assigned to fabrication and delivery activities. Costs shall be broken down within principal contracts in amounts typically not greater than \$30,000, but in no case greater than 5 percent of the Contract Sum.
 3. Each activity cost shall reflect an accurate value subject to approval by Architect.
 4. Total cost assigned to activities shall equal the total Contract Sum.
- F. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the time effect, if any, of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Preliminary Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized, cost-and resource-loaded, time-scaled CPM network analysis diagram for the Work.
1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 4. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.

- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing and commissioning.
 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 3. Processing: Process data to produce output data on a computer-drawn, timescaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Sub-networks on separate sheets are permissible for activities clearly off the critical path.
- E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Principal events of activity.
 4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the Schedule of Values).
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.

6. Changes in total float or slack time.
7. Changes in the Contract Time.
- G. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
 1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
 2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
 4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
 - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
 - b. Submit value summary printouts one week before each regularly scheduled progress meeting.

2.4 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 by trade.
 3. Equipment at Project site.
 4. Material deliveries.
 5. High and low temperatures and general weather conditions.
 6. Accidents.
 7. Meetings and significant decisions.
 8. Unusual events (refer to special reports).
 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 and Architect Supplemental Interpretations (Instructions) received and implemented.
 15. Services connected and disconnected.
 16. Equipment or system tests and startups.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request For Interpretation (RFI). Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor must employ skilled personnel with experience in scheduling and reporting techniques or must employ a scheduling consultant. Submit qualifications and examples of previous scheduling for evaluation (and approval) by the Architect.
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule three (3) work days before each regularly scheduled progress meeting or Contractor may update schedule at the monthly progress meeting.
 - 1. The revised schedule should be updated immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting, no later than three days after the progress meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- C. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01322 - PHOTOGRAPHIC DOCUMENTATION

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 includes administrative and procedural requirements for the following:
 - 1. Preconstruction digital video.
 - 2. Periodic construction photographs.

1.3 SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each digital photograph. Indicate elevation or story of construction. Include same label information as corresponding set of photographs.
- B. Digital Construction Photographs: Submit one print of each digital photographic view within seven days of taking photographs.
 - 1. Format: Digital.
 - 2. Identification: The following information is required on each USB Drive(s) submitted:
 - a. Name of Project.
 - b. Name of Architect.
 - c. Name of Contractor.
 - d. Date photograph was taken if not date stamped by camera.
 - e. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - f. Unique sequential identifier.
 - 3. Digital Images: Submit a complete set of digital image electronic files as a Project Record document on USB Drive(s). Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, uncropped.
- C. Digital Video: Submit one copy of each digital video within seven days of recording.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project
 - b. Name of Architect.
 - c. Name of Contractor.
 - d. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - e. Date digital video was recorded.
 - f. Weather conditions at time of recording.
 - 2. Transcript: To include an audio narrative with the following information as a minimum.
 - a. Name of Project.
 - b. Date digital video was recorded.
 - c. Weather conditions at time of recording.

- d. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

PART 2 - EXECUTION

2.1 CONSTRUCTION PHOTOGRAPHS

- A. Film Images:
 1. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.
 2. Field Office Prints: Retain one set of prints of progress photographs in the field office at Project site, available at all times for reference. Identify photographs same as for those submitted to Architect.
- B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 1. Date and Time: Include date and time in filename for each image.
 2. Field Office Images: Maintain one set of images on USB Drive(s) in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Architect.
- C. Preconstruction Photographs: Before starting construction, take color, digital photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.
 1. Flag construction limits before taking construction photographs.
 2. Take eight photographs to show existing conditions adjacent to property before starting the Work.
 3. Take eight photographs of existing buildings either on or adjoining property in order to accurately record physical conditions at start of construction.
 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- D. Periodic Construction Photographs: Take 12 color, digital photographs monthly, coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

2.2 CONSTRUCTION DIGITAL VIDEO

- A. Narration: Describe scenes on digital video by audio narration by microphone while video is recorded. Include description of items being viewed, recent events, and planned activities. At each change in location, describe vantage point, location, direction (by compass point), and elevation or story of construction.
 1. Confirm date and time at beginning and end of recording.
 2. Begin each digital video with name of Project, Contractor's name, and Project location.
- B. Preconstruction Digital Video: Before starting construction, provide digital video of the Project site and surrounding properties from different vantage points, as needed to properly record all preexisting site conditions and adjacent conditions of all roadways, drives, structures that will incur construction traffic.
 1. Flag construction limits before recording construction video.
 2. Show existing conditions adjacent to Project site before starting the Work.
 3. Show existing buildings either on or adjoining Project site to accurately record physical conditions at the start of construction.
 4. Show protection efforts by Contractor.

PART 3 – NOT APPLICABLE
END OF SECTION

SECTION 01330 - SUBMITTAL PROCEDURES

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. The General Contractor shall use website software “**Submittal Exchange**” to conduct all submittal reviews in electronic format. **Paper format submittals will NOT be accepted.** All recordkeeping, date stamping, access controls, shall be **paid for by the Contractor** with access given to the entire Project Team. The software shall be capable of the following:
 - B. Costs:
 - 1. The General Contractor shall include the full cost of Submittal Exchange project subscription in their proposal. **The Contractor shall cover the full cost of Submittal Exchange project subscription for the project. The Contractor contractually, shall be fully responsible for all costs required to maintain full functionality through the acceptance of ALL project closeout requirements and documents. NO OTHER SOFTWARE WILL BE CONSIDERED.**
 - 2. **Contact Submittal Exchange at subex-sales_ww@oracle.com or call 1-800-633-0738 to verify costs prior to bid.**
 - 3. At the Contractor’s option, training is available from **Submittal Exchange** regarding use of website and PDF submittals. Contact Submittal Exchange at 1-800-714-0024 ext. 2
 - 4. Internet Service and Equipment Requirements:
 - a. Email address and Internet access at the Contractor’s main office.
 - b. Adobe Acrobat (www.adobe.com), Bluebeam PDF Revu (www.bluebeam.com), or other similar PDF review software for applying electronic stamps and comments.
 - 5. The General Contractor is responsible for maintaining and keeping Submittal Exchange active throughout the entire project, including closeout documents.
 - C. Procedures:
 - 1. Shop drawing and product data submittals shall be transmitted to Architect in electronic (PDF) format using **Submittal Exchange**, a website service designed specifically for transmitting submittals between construction team members.
 - 2. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
 - 3. The electronic submittal process is not intended for color samples, color charts, or physical material samples.
 - 4. Submittal Preparation – the Contractor may use any or all of the following options:
 - a. Subcontractors and Suppliers provide electronic (PDF) submittals to the Contractor via the **Submittal Exchange** website.
 - b. Subcontractors and Suppliers provide paper submittals to the General Contractor who electronically scans and converts to PDF format.
 - c. Subcontractors and Suppliers provide paper submittals to Scanning Service which electronically scans and converts to PDF format.
 - 5. The Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer / product, dimensions and coordination of information with other parts of the work.

6. The Contractor shall transmit each submittal to Architect using the Submittal Exchange website, www.submittalexchange.com.
7. The Architect / Engineer review comments will be made available on the Submittal Exchange website for downloading. Contractor will receive email notice of completed review.
8. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.
9. Submit paper copies of reviewed submittals at project closeout for record purposes in accordance with Section 01770 – Closeout Procedures.

D. Related Sections include the following:

1. Division 1 Section 01290 "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
2. Division 1 Section 01320 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
3. Division 1 Section 01322 "Photographic Documentation" for submitting construction photographs and construction videotapes.
4. Division 1 Section 01770 "Closeout Procedures" for submitting warranties.
5. Division 1 Section 01781 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
6. Division 1 Section 01782 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
7. Division 1 Section 01820 "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.
8. Divisions 2 through 16 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

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

1.4 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings will, under certain circumstances described hereinafter, be provided by Architect for Contractor's use in preparing submittals.
- 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. Submittals Schedule: Comply with requirements in Division 1 Section 01320 "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- D. Processing Time: Allow enough 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 re-submittals.

1. Initial Review: Allow **14** business days for initial review of each digital 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. Re-submittal Review: Allow **10** business days for review of each re-submittal.
 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow **10** business days for initial review of each submittal.
 - a. Structural, mechanical, plumbing, electrical, civil, audio/visual, sound system, and kitchen equipment components are examples of the Work that require sequential review. Architect will advise if there are others.
- E. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings. Provide another area of this same size for the Architect to affix his stamp. Stamp includes the following four categories: Reviewed, Furnish as Noted, Rejected, Revise and Resubmit; the Architect will mark one or more of these categories and return submittal to Contractor.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - i. Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.D.2.01). Re-submittals shall include an alphabetic suffix after another decimal point (e.g., 06100.D.2.R1 (R2, R3 etc. if necessary).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
- F. Deviations: Encircle or otherwise specifically identify deviations and list the deviations from the Contract Documents on submittals and list the deviations on the transmittal form accompanying submittal.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

1. Transmittal Form: Use AIA Document G810 or equivalent with at least the following information.
 - a. Project name.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Names of subcontractor, manufacturer, and supplier.
 - f. Category and type of submittal.
 - g. Submittal purpose and description.
 - h. Specification Section number and title.
 - i. Drawing number and detail references, as appropriate.
 - j. Transmittal number, numbered consecutively.
 - k. Submittal and transmittal distribution record.
 - l. Remarks.
 - m. Signature of transmitter.
 2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.
- H. Re-submittals: Make re-submittals 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 "Reviewed" or "Furnished as Noted".
- I. 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.
- J. Use for Construction: Use only final submittals with mark indicating "Reviewed" or "Furnished as Noted".

1.5 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

- A. General: McKee & Associates CAD Files shall not be released.
1. Should the Contractor require CAD Files they are encouraged to seek PDF to CAD Conversion vendors and/or software.

PART 2 - PRODUCTS

2.1 DIGITAL ACTION SUBMITTALS

- A. General: Prepare and submit Digital Action Submittals required by individual Specification Sections.
- B. All submittals shall be sent to the Architect no later than 45 calendar days from "Notice To Proceed".
1. Submittals shall be sent to Greg Anderson at the following email address:
submittals@mckeeassoc.com.
- C. Submittals regarding mechanical, plumbing, electrical and structural items shall be sent directly to the Engineer of record.

Site Improvements and Interior Alterations to
Fairhope High School for the
Baldwin County Public Schools
Fairhope, Alabama

SUBMITTAL PROCEDURES
01330-4

1. A digital copy of the transmittal shall be sent to the Architect at the following email address:
submittals@mckeeassoc.com.
- D. Product Data: Collect information into a single digital submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each the digital submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operation and maintenance manuals.
 - k. Compliance with specified referenced standards.
 - l. Testing by recognized testing agency.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.
 4. Submit Product Data before or concurrent with Samples.
 5. Number of Copies: Submit digital copy of the Product Data, unless otherwise indicated. Mark up and retain returned digital copy as a Project Record Document.
- E. Digital 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. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.

- k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 - m. Relationship to adjoining construction clearly indicated.
 - n. Seal and signature of professional engineer if specified.
 - o. Wiring Diagrams: Differentiate between manufacturer-installed and field installed wiring.
2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Digital Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches.
 3. Number of Copies:
 - a. Submit each original digital drawing submittal (specifically prepared for the project). Do not include MSDS documentation in any submittal. Architect will retain marked-up copy for his records and will return 1 (one) digital marked-up copy to the Contractor.
 - b. Submit digital copy (bound in sets) of hardware submittals, fixture schedules, manufacturers' data and all other submittals that have been prepared in an 11 inch by 17 inch or smaller format. The Architect will return 1 (one) digital copy set to the Contractor.
 - i. Upon receipt of his digital marked up shop drawings/submittals, the Contractor shall make as many copies for distribution as he deems necessary, however he shall retain one copy to mark-up further to show any and all construction changes that modify the submittal in any form. This document(s) shall be turned over to the Owner at the end of the Project along with the Record Documents.
- F. Color code: On all digital shop drawings submittals, schedules, etc., the Contractor's marks shall be in red, the Architect's in green and the Engineer's (if any involved) in blue. All comments shall be initialed by a responsible party within each organization.
- G. 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 appropriate Specification Section.
 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 4. 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. **Colors will not be approved until all color submittals are received by the architect.**
 - a. Number of Samples: Submit two full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return one submittal with options selected.
 - b. All color submittals are due within 45 days of the Notice to Proceed.

- c. The architect will be allowed 15 days from the date of the receipt of the last color submittal to approve colors.
- 5. 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 two sets of Samples. Architect will retain one Sample set and one will be returned. Mark up returned Sample set as a Project Record Sample.
 - i. Construct a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - ii. 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.
- H. Interior Color Selections: Any submittals that are associated with the aesthetics of the interior design shall not be approved until all submittals associated with the interior design are in the Architect's possession.
- I. Submittals Schedule: Comply with requirements specified in Division 1 Section 01320 "Construction Progress Documentation."
- J. Application for Payment: Comply with requirements specified in Division 1 Section 01290 "Payment Procedures."
- K. Schedule of Values: Comply with requirements specified in Division 1 Section 01290 "Payment Procedures."

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 - 1. Number of Copies: Submit digital copy of each submittal, unless otherwise indicated.
 - 2. Certificates and Certifications: Provide a notarized 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.
 - 3. Test and Inspection Reports: Comply with requirements specified in Division 1 Section 01400 "Quality Requirements."
- B. Coordination Drawings: Comply with requirements specified in Division 1 Section, 01310 "Project Management and Coordination."
- C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- E. Installer Certificates: Prepare 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.
- F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

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- G. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- I. Material Test Reports: Prepare 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.
- J. Product Test Reports: Prepare written reports indicating 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.
- K. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- L. Preconstruction Test Reports: Prepare 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.
- M. Compatibility Test Reports: Prepare 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.
- N. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, 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.
- O. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 1 Section 01782 "Operation and Maintenance Data."
- P. Design Data: Prepare 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.
- Q. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
 - 1. Preparation of substrates.
 - 2. Required substrate tolerances.
 - 3. Sequence of installation or erection.

4. Required installation tolerances.
 5. Required adjustments.
 6. Recommendations for cleaning and protection.
- R. Manufacturer's Field Reports: Prepare written information documenting factory authorized service representative's tests and inspections. Include the following, as applicable:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- S. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- T. Construction Photographs and Videotapes: Comply with requirements specified in Division 1 Section 01322 "Photographic Documentation."
- U. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Architect.
1. Architect will not review submittals that include MSDSs and will return the entire submittal for re-submittal.

2.3 DELEGATED DESIGN

- 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 Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit one copy of a statement, 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. Review each digital 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. Approval Stamp: Stamp each digital 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 digital submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each digital submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each digital submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
 - 1. REVIEWED—Indicates that reviewed submittal is satisfactory.
 - 2. REJECTED—Indicates submittal is not satisfactory and another properly prepared submittal of same or another product must be prepared and resubmitted.
 - 3. FURNISH AS NOTED—Indicates submittal is satisfactory if the changes, modifications, notes, etc. marked by the Architect are made a part of the submittal.
 - 4. REVISE AND RESUBMIT—Indicates although parts of the submittal are satisfactory, there are enough significant modifications that must be made to require the Contractor, subcontractor, supplier, and/or manufacturer to provide additional essential information to his submittal and then resubmit it to the Architect.
- 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. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 01500 - 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 1 Specification Sections apply to this Section.

1.2 SUMMARY

- A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Sections include the following:
 - 1. Division 1 Section 01100 "Summary" for limitations on utility interruptions and other work restrictions.
 - 2. Division 1 Section 01330 "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
 - 3. Division 1 Section 01700 "Execution Requirements" for progress cleaning requirements.
 - 4. Divisions 2 through 16 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.
 - 5. Division 2 Section 02282 "Termite Control" for pest control.

1.3 DEFINITIONS

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 USE CHARGES

- A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Sewer connections will not be in place for most if not all of the duration of the project. When and if the off-site sewer is installed by others and sewer piping under this contract is installed, should the contractor decide to connect to the sewer he must pay all sewer use charges until the project is turned over to the Owner.
- C. Water Service: Pay water service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric power service use charges for electricity used by all entities for construction operations.

1.5 SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.6 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.

1.7 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall 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.
 - 1. Minimum Requirement: One (1) 10 foot wide x 44 foot long unit required.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of construction personnel. Keep office clean and orderly. Furnish and equip offices as follows:
 - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
 - 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack board.
 - 3. Drinking water and private toilet.
 - 4. Coffee machine and supplies.
 - 5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
 - 6. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
- 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: 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 testing agency acceptable to authorities having jurisdiction and marked for intended use.

PART 3 - EXECUTION

3.1 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.
- 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.

3.2 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. Sanitary Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 2. Connect temporary sanitary sewer from construction office to a submerged temporary holding tank, as directed by authorities having jurisdiction.
 3. Provide erosion control structures to drain storm water from site.
- B. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction from existing water lines in the street. Contractor shall pay for any metering costs and associated fees required by the City Water Department.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
1. Toilets: Use of Owner's existing toilet facilities will not be permitted.
- D. 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.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Provide temporary electric meter power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations. Contractor shall be responsible for any charges associated with said service.
1. Install electric power service overhead, unless otherwise indicated.
- G. 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.
- H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line for each field office.
1. Provide additional telephone lines for the following:
 - a. Provide a dedicated telephone line for each facsimile machine and computer in each field office.
 2. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Architect's office.
 - e. Engineers' offices.
 - f. Owner's office.
 - g. Principal subcontractors' field and home offices.
 3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

- I. Electronic Communication Service: Provide temporary electronic communication service, including electronic mail, in common-use facilities, or other suitable high speed internet connection.
 1. Provide DSL in primary field office.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 1. Provide incombustible construction for offices, shops, and sheds located within construction area with good visibility of construction. Comply with NFPA 241.
 2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. 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.
- C. 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 nor endanger permanent Work or temporary facilities.
- D. Project Identification and Temporary Signs: Erect Project identification, General Contractor's sign, Architect's sign and other signs as approved. Install signs where directed to inform public and individuals seeking entrance to Project. Subcontractor signs are not permitted.
- E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.
- F. Temporary Stairs: Until permanent stairs are available, provide one temporary stair between floors, located near the center of the building.
- G. Temporary Use of Permanent Stairs: Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that 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 Division 1 Section "Summary."
- B. Temporary Erosion and Sedimentation Control: Comply with requirements specified in Division 2 02100 Section "Site Preparation."
- C. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

- F. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
 - 1. Prohibit smoking in construction areas.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 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. Carefully remove and turn over Architect's sign to the Architect.
 - 2. Where area is intended for landscape development, in an area that has been used as a compacted temporary road bed, remove soil and aggregate fill that do not comply with requirements for landscaping 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, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section 01770 "Closeout Procedures."

END OF SECTION

SECTION 01600 - 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 1 Specification Sections apply to this Section.

1.2 SUMMARY

- A. This 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; product substitutions; and equal products.
- B. Related Sections include the following:
 - 1. Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

- A. Products: Items purchased 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. Equal Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, 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. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating equal products of other named manufacturers.

1.4 SUBMITTALS

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
 - 1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
 - 2. Form: Tabulate information for each product under the following column headings:
 - a. Specification Section number and title.
 - b. Generic name used in the Contract Documents.
 - c. Proprietary name, model number, and similar designations.
 - d. Manufacturer's name and address.
 - e. Supplier's name and address.
 - f. Installer's name and address.

- g. Projected delivery date or time span of delivery period.
 - h. Identification of items that require early submittal approval for scheduled delivery date.
- 3. Completed List: Within 60 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
- 4. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.
- B. 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 CSI Form 13.1A.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified materials or products cannot be provided.
 - b. Coordination information, including a list of changes or modifications 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 substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
 - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution 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 lack of availability or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - l. 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 7 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 7 days of receipt of additional information or documentation, whichever is later.
 - a. Form of Acceptance: Change Order.

- b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.
 - c. If Contractor's Substitution Requests are repeatedly (i.e. 3 times) submitted incomplete, i.e., no definitive response to items "a" through "l", the Architect will not consider any further Substitution Requests.
- C. Equal Product 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. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of an equal product request. Architect will notify Contractor of approval or rejection of proposed equal product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
 - a. Use product specified if Architect cannot make a decision on use of an equal product request within time allocated.
- D. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section 01330 "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, product selected shall be compatible with products previously selected, even if previously selected products were also options.
- B. The Contractor MUST provide the Owner with a Certificate of Asbestos Free Building Materials at the end of the project certifying that all building materials incorporated, installed, and used during the construction process of the project by the Contractor or its Subcontractors of any tier are 100% asbestos free. Asbestos Free means containing 0% asbestos in any form. The Certificate of Asbestos Free Building Materials form is included in the project manual.

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. 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 ensure compliance with the Contract Documents and to ensure 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. Store cementitious products and materials on elevated platforms.
 - 5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.

6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.
9. 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:
 - a. 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.
 - b. 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.
 - c. 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.
 - d. 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.
 - e. 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.

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: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Warranty start for mechanical and electrical equipment being date of substantial completion.
- D. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that 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 not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Equal Products" Article to obtain approval for use of an unnamed product.

E. Product Selection Procedures:

1. Products and Manufacturers: In particular instances there may only be a single product or manufacturer appropriate for use on the project, in which case where Specifications name a single product and manufacturer and say "no equal", provide the named product.
2. Products and Manufacturers: When one or two products or manufacturers are specified and have the words "or approved equal", the Contractor may propose to provide alternatives in the form of a Substitution Request which once reviewed by the Architect will be either accepted or rejected. If Substitution Request is submitted for approval 7 days prior to the receipt of bids and approved by the Architect, said approvals will be included in Addenda. Only those Substitution Requests listed as approved in Addenda may bid the project.
3. Products and Manufacturers: Where Specifications include a list of three (3) or more names of both products and manufacturers, provide one of the products listed that complies with requirements. No substitutions will be accepted.
4. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or an equal 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.
5. Visual Matching Specification: Where Specifications require matching an established Sample, product must comply with all requirements and must match Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product
6. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
 - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
 - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

1.8 PRODUCT SUBSTITUTIONS

- A. Timing: Architect will consider requests for substitution under the conditions set forth in this section under Product Selection Procedures, if received within 60 days after the Notice to

Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

- B. Conditions: Architect will consider Contractor's request for substitution under the conditions set forth in this section under Product Selection Procedures and when the following conditions are satisfied. If the following conditions are not satisfied,
- C. Architect will return requests without action, except to record noncompliance with these requirements:
 - 1. 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.
 - 2. Requested substitution requires no or only very minor revisions (as determined by the Architect), to the Contract Documents.
 - 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - 4. Substitution request is fully documented and properly submitted.
 - 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 - 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - 7. Requested substitution is compatible with other portions of the Work.
 - 8. Requested substitution has been coordinated with other portions of the Work.
 - 9. Requested substitution provides specified warranty.
 - 10. 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 - NOT APPLICABLE

PART 3 - NOT APPLICABLE

END OF SECTION

SECTION 01700 - EXECUTION REQUIREMENTS

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 includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. General installation of products.
 - 4. Coordination of Owner-installed products.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
 - 8. Correction of the Work.
- B. Related Sections include the following:
 - 1. Division 1 Section 01310 "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
 - 2. Division 1 Section 01330 "Submittal Procedures" for submitting surveys.
 - 3. Division 1 Section 01770 "Closeout Procedures" for submitting Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 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. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- D. Certified Surveys: Submit two copies signed by professional engineer.

1.4 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.

PART 2 - EXECUTION

2.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Before construction, verify the location and points of connection of utility services.

- B. Existing Utilities: The existence and location of underground and other utilities and construction

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indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities 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; and underground electrical services.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: 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. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.
 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

2.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and 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, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on RFI, "Request for Interpretation."

2.3 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 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 dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 3. Inform installers of lines and levels to which they must comply.
 4. Check the location, level and plumb, of every major element as the Work progresses.
 5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 6. 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 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.

2.4 FIELD ENGINEERING

- A. 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.
- B. 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.
- C. 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.
- D. Final Property Survey: Submit a final property survey certifying exact locations of site improvements including building(s), parking lots, roadways and utilities including structure elevations, top and invert, distances from property lines, and with any variation from the original civil staking and layout and utility drawings identified.

2.5 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 8 feet in spaces without a suspended ceiling unless shown otherwise on drawings.
- 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.
 - D. Maintain conditions required for product performance until Substantial Completion.
 - E. 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.
 - F. Tools and Equipment: Do not use tools or equipment that produce harmful 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 work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
 - H. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 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. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

2.6 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction forces.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.
 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. Pre-installation Conferences: Include Owner's construction forces at pre-installation conferences covering portions of the Work that are to receive Owner's work. Attend pre-installation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

2.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. 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 materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.

3. Containerize hazardous and unsanitary waste materials separately from other waste.

Mark containers appropriately and dispose of legally, according to regulations.

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: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

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 assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

2.8 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section 01400 "Quality Requirements."

2.9 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. Comply with manufacturer's written instructions for temperature and relative humidity.

2.10 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

PART 3 – NOT APPLICABLE
END OF SECTION

SECTION 01770 - 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 1 Specification Sections apply to this Section.

1.2 SUMMARY

- B. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Warranties.
 - 3. Final cleaning.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
 - 6. Deliver spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 8. Complete startup testing of systems.
 - 9. Submit test/adjust/balance records.
 - 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 11. Advise Owner of changeover in heat and other utilities.
 - 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 - 13. Complete final cleaning requirements, including touchup painting.
 - 14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. 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. Re-inspection: Request re-inspection 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.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
 1. Submit a final Application for Payment according to Division 1 Section 01290 "Payment Procedures."
 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report and warranty.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes.
- B. Inspection: Submit a written request for final inspection for acceptance. 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. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies 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. Mark the Architect's punch-list so-as-to identify those items that are still outstanding and uncorrected at the time of submission.

1.6 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch 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.
- C. 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.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide 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 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. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - d. 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.
 - e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - f. Remove labels that are not permanent.
 - g. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - i. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - h. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - i. Replace parts subject to unusual operating conditions.
 - j. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - k. Clean ducts, blowers, and coils if units were operated without filters during construction.
 - l. Leave Project clean and ready for occupancy.

END OF SECTION

SECTION 01781 - 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 1 Specification Sections apply to this Section.

1.2 SUMMARY

- B. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Digital Record Drawings.
 - 2. Digital Record Specifications.
 - 3. Digital Record Product Data.

1.3 SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set of digitally scanned marked-up Record Prints.
- B. Record Specifications: Submit one copy of digitally scanned Project Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one digitally scanned copy of each Product Data submittal.
- D. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one clean set of blue- or black-line white prints of the Contract Drawings and Shop Drawings and one copy of the project manual (specification) at the job site for the sole purpose of recording changes to the drawings and specifications.
- B. 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 prepare the marked-up Record Prints.
 - 1. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - 2. Accurately record information in an understandable drawing technique.
 - 3. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
- C. Content: Types of items requiring marking include, but are not limited to, the following:
 - 1. Dimensional changes to Drawings.
 - 2. Revisions to details shown on Drawings.
 - 3. Locations and depths of underground utilities.
 - 4. Revisions to routing of piping and conduits.
 - 5. Revisions to electrical circuitry.
 - 6. Actual equipment locations.
 - 7. Duct size and routing.
 - 8. Locations of concealed internal utilities.

9. Changes made by Change Order or Construction Change Directive. (Posted on Documents.)
 10. Changes made following Architect's written orders, i.e. ASIs. (Posted on Documents.)
 11. Details not on the original Contract Drawings. (Posted on Documents.)
 12. Field records for variable and concealed conditions.
 13. Record information on the Work that is shown only schematically.
 14. Changes made in response to Contractor's questions, i.e. RFIs. (Posted on Documents.)
- D. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
 - E. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - F. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - G. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable. Where posting is required, post on Drawing Set and in Specifications on sheets or pages adjacent to or on top of where modification applies.
 - H. Attachment method shall be taped at top only, so as to access original underneath.
 - I. Digitally scan all documents and provide on CD Rom to Architect.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications. Maintain one clean copy of the project manual (specification) at the job site for the sole purpose of recording changes to the drawings and specifications.
 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, Record Product Data, and Record Drawings where applicable.
- B. Digitally scan all documents and provide on CD Rom to Architect.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
- B. Maintain one clean set at the job site for the sole purpose of recording changes to the drawings and specifications.
 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, Record Specifications and Record Drawings where applicable.
- C. Digitally scan all documents and provide on CD Rom to Architect.

2.4 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.

PART 3 - RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples 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. Architect's representative will review Record Documents with the project superintendent each month to determine to his satisfaction whether or not Record Documents are being kept up to date. Failure to do so will result in the delay of processing pay request until Record Documents are brought up to date.

END OF SECTION

SECTION 01782 - 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 1 Specification Sections apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Maintenance manuals for the care and maintenance of products, materials, finishes, systems and equipment.

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 SUBMITTALS

- A. Submittal: Submit one copy of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 15 days after final inspection.
 - 1. Correct or modify each manual to comply with Architect's comments. Submit three copies of each corrected manual within 15 days of receipt of Architect's comments.

1.5 COORDINATION

- A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Organization: Include a section in the directory for each of the following:
 - 1. List of documents.
 - 2. List of systems.
 - 3. List of equipment.
 - 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. 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.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- 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

2.2 MANUALS, GENERAL

- A. Organization: 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: Enclose title page in transparent plastic sleeve. 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, address, and telephone number of Contractor.
 - 6. Name and address of Architect.
 - 7. 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.
 - 1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch 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. Indicate volume number for multiple-volume sets.
 - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. 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 diskettes for computerized electronic equipment.
 - 4. Supplementary Text: Prepared on 8-1/2-by-11-inch 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.

2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- B. 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.
- C. 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.
- D. 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.

2.4 OPERATION MANUALS

- A. 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.
 2. Performance and design criteria if Contractor is 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.

- B. Descriptions: Include the following:
 - 1. Product name and model number.
 - 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.
- C. 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.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUAL

- A. 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.
- B. 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.
- C. 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.
- D. 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.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. 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.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. 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 warranty and bond information, as described below.
- B. 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.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard printed maintenance instructions and bulletins.
 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.
- D. 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 videotape, if available.
- E. 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.
- F. 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.
- G. Maintenance Service: Some equipment and products require maintenance by the manufacturer, supplier or subcontractor, i.e., an authorized service representative, as part of the warranty. The General Contractor shall ensure that said maintenance work is done and provide copies of service reports to the Owner.

- H. 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 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. 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.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
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.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, 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.
1. 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.
- F. 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 operation and maintenance manuals.
2. Comply with requirements of Record Drawings in Division 1 Section 01781 "Project Record Documents."
- G. Comply with Division 1 Section 01770 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 01820 - DEMONSTRATION AND TRAINING

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 includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training digital media.

1.3 SUBMITTALS

- A. Instruction Program: Submit two copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. At completion of training, submit one complete training manual for Owner's use.

1.4 QUALITY ASSURANCE

- A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 1 Section 01400 "Quality Requirements," experienced in operation and maintenance procedures and training.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.
- B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Instructor: Engage a qualified instructor to prepare instruction program and training modules, and
Site Improvements and Interior Alterations to
Fairhope High School for the
Baldwin County Public Schools
Fairhope, Alabama

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to coordinate between Contractor and Owner for number of participants, instruction times, and location.

- B. Instructor shall demonstrate to Owner's personnel how to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Architect, with at least seven days' advance notice.

END OF SECTION

SECTION 02070 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Extent of demolition work is shown on drawings, as well as all items necessary to complete new work indicated on plans.
- B. Schedule of Demolition Work: Demolition includes but is not limited to the following:
 - 1. Any damage to existing facilities at the site after the Contractor takes possession shall be repaired by this Contractor at his expense.
 - 2. Contractor shall replace grass/sod damaged during the construction. Fill in ruts caused by equipment with topsoil and grass over to match existing conditions.
 - 3. As indicated on the Drawings.
 - 4. All other items indicated required to be demolished to complete new work.

1.3 SUBMITTALS

- A. Schedule: Submit proposed methods and operations of demolition work to Architect for review prior to start of work. Include in schedule coordination for shut-off, capping and continuation of utility services as required.
 - 1. Provide a detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

1.4 JOB CONDITIONS

- A. Condition of Structures: Conditions existing at time of inspection for bidding purposes will be maintained by Owner in so far as practicable.
- B. Explosives: Use of explosives will not be permitted.
- C. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
- D. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- E. Protections: Ensure safe passage of persons (night or day) around area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities and persons.
 - 1. Erect temporary covered passageways as required by authorities having jurisdiction.
 - 2. Provide temporary fencing as necessary to secure the limits of construction. Fencing shall be substantial to deter passage, fencing material shall be at Contractors discretion.
- F. Damages: Promptly repair damages caused to adjacent facilities by demolition operations at no cost to Owner.
- G. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.
 - 1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
 - 2. All electrical work to be removed, relocated or reconnected shall be performed by a licensed Electrical Contractor in accordance with the NEC and any applicable local codes and ordinances.

PART 2 – PRODUCTS [NOT APPLICABLE]

PART 3 - EXECUTION

3.1 DEMOLITION - DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Remove from site debris, rubbish and other materials resulting from demolition operations.
- B. Burning of removed materials from demolished structures will not be permitted on site.
- C. Removal: Transport materials removed from demolished structures and legally dispose of off-site, in area approved by all local authorities and ADEM.

END OF SECTION

SECTION 02514 - PORTLAND CEMENT CONCRETE PAVING

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 work of this section.

1.2 DESCRIPTION OF WORK

- A. Extent of Portland cement concrete paving work is indicated on drawings.
- B. Paving work includes, but is not limited to the following:
 - 1. Walks.
 - 2. Mechanical Pads.
- C. Prepared subgrade is specified in Specification Section: "EARTHWORK".
- D. Concrete and related materials are specified in Division 3 Specifications.

1.3 QUALITY ASSURANCE

- A. Referenced Standards: Where the term "Referenced Standard" is used in these Project Specifications, it shall be interpreted as **referring to the current edition of "Standard Specifications for Highway Construction" 2018 or latest edition of Alabama Department of Transportation**. Referenced Divisions of the "Standard" are hereby made a part of this Project Specification insofar as they may be termed applicable. In no case will requirements for "Method of Measurement" and "Basis of Payment" be considered as applicable to this Project Specification.
- B. Testing and Inspection:
 - 1. Testing and Inspection Services: The **Owner** will engage and pay for testing and inspection services, to include testing soil materials proposed for use during paving operations.
 - 2. Field tests will be performed in conjunction with a proof rolling inspection of the prepared subgrade to verify that existing subgrade conditions are similar to those assumed in the design and therefore adequate for support of the pavement system.
- C. Do not change source or brands of material during the course of the work.

1.4 INSPECTION AND APPROVAL OF WORK

- A. Before commencement of work, Contractor shall coordinate with the Architect to arrange for inspection and approval of initial installation of slabs-on-grade. The approved initial installations shall serve as the standard to which all subsequent work shall adhere.

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT CONCRETE

- A. Dumpster Pad: After subgrade is approved, place 6" of 4000 psi concrete (550 psi flexural strength) at the dumpster pad and place 6" of 4000 psi concrete at a 20' approach apron in front of the dumpster pad.
- B. Curbs: shall be constructed to details shown on the drawings with uniform slopes for drainage as indicated, providing for expansion joints at 10' intervals. Form all radii as shown and tool exposed edges of all curbs.
- C. Concrete walks:
 - 1. Concrete walks shall be poured 4" thick with expansion joints every 30 feet **MAXIMUM**.

2. Provide sawn joints 1/4" wide x 3/4" deep where indicated on drawings.
 3. Score walks with tool every 6' or as indicated on drawings.
 - a. Contractor may also use sawn joints at locations indicated to be scored.
 4. Light broom finish all walks.

Pitch 2% Maximum, 1% Minimum to side for surface drainage.

Concrete walks shall be reinforced with 6 x 6 #10/10 mesh unless noted otherwise.

 - a. Contractor may use fiber mesh reinforcement in lieu of wire mesh at walks.
- D. Pad for Condenser or Transformer: 4" thick concrete slab installed over compacted bed. Edges neatly tooled. Verify exact elevation, size and location with HVAC and/or electrical contractor and architect.

2.2 MATERIALS - CONCRETE

1. Concrete shall be plant or transit mixed having a minimum of 28 day strength of 4000 psi (550 psi flexural strength), maximum 4" slump. Proportioning and control of the mix shall be as required under the concrete section of these specifications.

2.3 MATERIALS - REINFORCING

1. Fiber Reinforcement:
 - a. Fiber Force 500 (Fibril Pro) Micro synthetic Fiber Reinforcement by ABC Polymer Industries or Equal.
 - b. Add to concrete mix at 1.5 pounds per cubic yard of concrete.
 - c. Finishing: Broom finish; pull broom in one direction such that fibers lay down.
 - d. Locations for Use: All concrete sidewalks, paving and handicap ramps.
2. Steel reinforcement if required shall be 6 x 6 #10/10 W.W.M. unless noted otherwise.
3. Expansion joint material shall be premoulded treated fibre 1/2" thick.

PART 3 – EXECUTION

3.1 CONCRETE FORMWORK

- A. Execute construction of concrete formwork in accordance with the "Referenced Standard".

3.2 CLEANING UP

- A. Remove all surplus materials, rubble, cartons and other debris resultant from work of this Section and haul off site. Repair damage resulting from paving operations. Leave entire work in broom-clean condition.

END OF SECTION

SECTION 02811 - SEEDING AND TOPSOIL

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 work of this section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Seed:
 - 1. Seeds shall be **Tifton Bermuda** in accordance with State of Alabama Highway Department Specification Section 652.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Seeding season(s) shall be restricted to those as instructed or recommended by the local Cooperative Extension Agent except when special instructions to the contrary are issued in writing by the Architect.
 - 1. The Contractor shall furnish, in writing to the Architect, those recommendations of the Extension Agent before proceeding with any operations.
 - 2. Seeding also shall comply with State of Alabama Highway Department specifications, latest Edition.
 - 3. Contractor shall water and maintain newly seeded areas until acceptable stand of grass is established and approved by the Architect.
- B. Preparation of Subgrade Soil:
 - 1. The subgrade soil in those areas to be seeded whether shown or not shown on the plans shall be loosened to a minimum depth of 3 inches and graded to remove all ridges and depressions so that it will be, after settlement everywhere parallel to and at the proper level to provide finished grades specified.
 - 2. All stones over 1" in dimension, sticks, rubbish and other extraneous matter shall be removed during this operation.
- C. Topsoil:
 - 1. Contractor shall furnish and spread layer of topsoil over all areas.
 - 2. Topsoil shall be spread in loose layers to provide finished grades specified and shall have an equal depth of not less than 4" over the site after natural settlement and light rolling.
- D. All areas shall be carefully graded and raked to accurate specified grades and uniform slopes following topsoil spreading. The surface, when finished and settled shall conform to required grades and shall be free from hollows and other inequalities, from stones over 1" in diameter, sticks and other debris, and shall be satisfactory to the Architect.
- E. Initial fertilization of sodded area prior to sodding and following preparation, commercial fertilizer 4-10-10 or 4-12-12 shall be applied on all grass areas at the uniform rate of 20 pounds per 1,000 square feet each.

3.2 SEEDING

- A. Prepare all areas to receive seeding.
- B. **The Contractor shall fully seed all areas indicated on the drawings.**

C. **If not indicated, the Contractor shall fully Sod the areas per Section 02810, Sodding and Topsoil.**

D. Seedbeds shall be firmed by rolling before seedings are made.

E. The seed or seed mixture for lawn areas as recommended shall be sown at the rate of six pounds per one thousand square feet exercising great care that a uniform distribution of seed is obtained.

F. Seeding shall be done on a still day, using a hopper type seeder, one-half of the seed or seed mixture for each area being sown in a direction at right angles to the other half.

G. After seeding, the surface shall be lightly raked, rolled once with a roller weighing not less than one hundred pounds per lineal foot, and thoroughly watered with a fine spray.

3.3 TOPSOIL

A. General:

1. Provide topsoil of natural, friable, fertile, fine loamy, soil possessing the characteristics of representative top soils in the vicinity which produces a heavy growth; free from subsoil, weeds, litter, clods, stiff clay, stones, stumps, roots, trash, toxic substances or any other material which may be harmful to plant growth or hinder planting operations.

2. The topsoil shall not be in a muddy or frozen condition. Topsoil shall be that material stripped and stockpiled, or as required to provide 4" of coverage.

3. The topsoil shall have a pH range of 5.9 to 7.0.

4. Limestone or aluminum sulfate (or acceptable substitute) may be used to adjust the pH of the topsoil to an acceptable level.

3.4 MULCHING

A. Mulching of seeded areas is required and shall consist of hand or machine application of mulch.

B. The mulch shall be loose enough to permit air to circulate but compact enough to reduce erosion.

C. If baled mulch material is used, care shall be taken that the material is in a loosened condition and contains no lumps or knots of compacted material.

D. The rate of application shall be sufficient to provide a layer of mulch ½ inch thick in depth over the entire seeded area.

E. Mulching shall begin immediately following completion of seed sowing operations.

END OF SECTION

SECTION 02825 - ORNAMENTAL PRIVACY FENCE SYSTEMS & GATES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Privacy Grade.
- B. Privacy gates and related hardware (including panic hardware).
- C. Concrete foundations for posts.

1.2 RELATED WORK

- A. Section 03310, Concrete

1.3 SYSTEM DESCRIPTION

- A. The Contractor shall supply and install a total Industrial Ornamental Steel Privacy Fencing System. The system shall include all components (i.e., pickets, posts, rails, gates and hardware) required.

1.4 DELEGATED DESIGN FOR FOUNDATIONS OF FENCE POSTS:

- A. Installer of Ornamental fences and gates shall employ a professional engineer, licensed in the state of Alabama, to provide engineering design for the post foundations based on local conditions, and to affix their professional seal to the shop drawings for the foundations.

1.5 REFERENCES

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus.
- C. ASTM D523 - Test Method for Specular Gloss.
- D. ASTM D714 - Test Method for Evaluating Degree of Blistering in Paint.
- E. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
- F. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
- G. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
- H. ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- I. ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.
- J. ASTM F2408 – Ornamental Fences Employing Galvanized Steel Tubular Pickets.

1.6 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.7 SUBMITTALS

- A. Product Data: Manufacturer's technical literature for each product specified.
 - 1. Include preparation instructions and recommendations.
 - 2. Include storage and handling requirements and recommendations.
 - 3. Include manufacturer's installation instructions.
- B. Shop Drawings: Elevations of fencing panels, spacing of components, hardware, and gates. Provide foundations for fence post shop drawings stamped by professional engineer.

- C. Samples for Initial Selection: For each product and finish specified, sets of color chips representing manufacturer's full range of available colors.
- D. Samples for Verification: For each fence material and for each color specified representing each color specified.
 - 1. Provide samples: 24 inches square of replica of fencing panel.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this section with minimum five years documented experience.
- B. Installer Qualifications: Experienced with type of construction involved with specified materials and per manufacturer's instructions.
- C. Mockups: Build mockups to verify selections made under sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation
 - 1. Include 6-foot length of fence complying with requirements.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store and protect fencing components so they are in undamaged condition when installed.
- B. Store fencing components in manufacturer's unopened packaging to protect surfaces until ready for installation.
- C. Store fencing components off the ground in a dry, protected, covered and secure area.

1.10 FIELD CONDITIONS

- A. Install fencing components only when weather conditions are in comply with manufacturer's installation instructions.

1.11 WARRANTY

- A. Manufacturer's Warranty: Provide warranty that manufacturer agrees to repair or replace products or components that fail in materials or workmanship within the specified warranty period. Manufacturer also warrants that the powder coated finish will not chip, crack, or flake.
 - 1. Warranty Period: Limited lifetime warranty - 30 years from date of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Privacy Fence and Gates:
 - 1. Barrette Outdoor Living: 2401 Corporate Blvd, Brooksville, FL 34604. Toll Free: (877) 258-6448. Phone: (352) 754-8555. Fax: (354) 544-8442. Email: info@alumi-guard.com. Web: www.alumi-guard.com
 - 2. Catalyst Fence Solutions, Atlanta, GA, phone 888-549-7350
 - 3. Parallel Architectural Products, Englewood, CO, phone 866-472-7255
- B. Exit Bar Kits
 - 1. DAC Industries.
 - 2. Lockey USA
 - 3. Detex
- C. Equal products of other manufacturers may be used in the work provided, such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS

- A. Aluminum, General: Provide alloys and tempers with not less than the strength and durability properties of alloy and temper designated in paragraphs below for each aluminum form required.
 - 1. Extrusions: ASTM B 221.
 - a. Posts and Channels: Alloy 6005-T5.
 - b. Slats: Alloy 6005-T5.
 - c. Clip Lock: Alloy 6005-T5
 - 2. Plate and Sheet: ASTM B 209, Alloy 6061-T6.
 - 3. Castings: ASTM B 26, Alloy ADC12.
- B. Fasteners: Screws of ASTM A 276, 410 stainless steel with heads painted to match fencing color.
- C. Accessories: As required by conditions, post caps, wall brackets, scrolls, finials, and other miscellaneous hardware fabricated of aluminum.
- D. Retain one of the following two paragraphs for post foundations.
- E. Concrete: Types specified in Division 03 Section "Cast-in-Place Concrete."
- F. Concrete: ASTM C 94, Option A; minimum 3,000 psi strength at 28 days.
- G. Swing Gate Exit Bar Kit (Black Color): DAC Industries. Model 10045-B Premium Exit Bar Kit Detex Advantex (Basis of Design & Quality). Includes Stainless Steel Exit Bar, adjustable mounting plate, adjustable receiver bracket for latch post, Lock Box for entry from outside of gate and key cylinder with 2 keys.

2.3 ORNAMENTAL FENCING

- A. Privacy Grade Fencing:
 - 1. Aluminum Channel: 2 inches tall by 1 inch wide; with top thickness 0.100 inch and .100-inch side wall thickness; according to ASTM F 2957.
 - 2. Slats: 5 inches wide by .050 inch thick; according to ASTM F 2957.
- B. Style:
 - 1. Board on Board
 - 2. Shadowbox
- C. Grade: Privacy.
 - 1. Panel Length Inside Posts: Nominal 68 inches.
- D. Posts:
 - 1. 6 inches square with 0.250 in. wall thickness.
- E. Fence Panel Height:
 - 1. 96 inches.
- F. Privacy Gates: Provide to match style specified.
 - 1. Construction: 2 in. x 2 in. by .125 in. wall, welded square frame gates.
 - 2. Height: 96 inches
 - 3. Opening Width:
 - a. Double 48" walk gates with standard hardware in a 96" wide opening. Field verify prior to fabrication.
 - 4. Hardware:
 - a. Self-closing hinges.

- b. Lever latch - single sided or double sided (coordinate to ensure workability and functionality with Swing Gate Exit Bar Kit)
- c. Drop-rod for one leaf of double gates.
- d. Single hole lock box.

2.4 FABRICATION

- A. Punch channels (horizontal rails) to allow slats to be installed on the side(s) of the rail. The number of channels vary with the style, height, and strength as determined by manufacturer.
- B. Fasten slats to channels with specified screws on the side(s) of the channel.
- C. Punched posts to allow the clips to be attached with specified screws. Affix post caps to top of posts.
- D. Fabricate gates using same components as for fencing. Walk through gates shall have adjustable self-closing hinges and shall be self-latching.

2.5 FINISH

- A. Super-Durable Polyester Powder Coating: High performance polyester, medium glass, applied to over 2.0 mil thickness complying with AAMA 2604 with the following performance characteristics:
 - 1. Meet or exceed 3,000-hour salt spray test according to ASTM B 117.
 - 2. Meet or exceed a H-2H pencil hardness according to ASTM D 3363.
 - 3. Meet or exceed a 5B rating on the ASTM D 3359 adhesion test.
- B. Color: To be selected by Owner from Manufacturer's Standard Colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions:
 - 1. Examine substrates to receive decorative metal fences and associated work for compliance with requirements and other conditions affecting performance.
 - 2. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents.
 - 3. Starting work within a particular area will be construed as acceptance of surface conditions.

3.2 PREPARATION

- 1. Prepare the grade and remove surface irregularities, if any, which may cause interference with installation of decorative metal fences.

3.3 INSTALLATION

- 1. Install decorative metal fences according to manufacturer's installation instructions.
- 2. Excavate holes for posts to diameter and spacing indicated without disturbing underlying materials.
- 3. Center and align posts in excavated holes to required depth. Place concrete around posts and vibrate or tamp for consolidation. Recheck vertical and top alignment of posts, verify they are plumb and level. Make necessary corrections if needed before concrete hardens.
- 4. For surface mounted on hard surfaces, set posts and fasten to surface using corrosion resistant anchors. Avoid mounting over expansion or control joints.
- 5. Horizontal rails to be snapped onto the clip locks on posts and fasten with specified screws.
- 6. Support gates from gate posts. Avoid attaching hinged side of gate to building wall.

7. Install gates plumb, level and secure for full opening without interference. For double gates, install drop rod. Adjust hardware for smooth operation.

3.4 ERECTION TOLERANCES

1. Maximum Variation from Plumb: 1/4 inch.
2. Maximum Offset from Indicated Position: 1 inch.
3. Minimum Distance from Property Line: 6 inches.

3.5 CLEANING

1. Clean decorative metal fences with mild detergent and rinse with clean water.
2. Remove mortar from decorative metal fences using a 10 percent solution of muriatic acid followed immediately by several rinses of clean water.

3.6 ADJUSTING

1. Touch-up paint scratched surfaces using paint pens supplied by manufacturers that match fence color.

END OF SECTION

SECTION 03310 – CAST-IN-PLACE CONCRETE

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 work of this section.

1.2 DESCRIPTION OF WORK

- A. Extent of concrete work is shown on drawings.

1.3 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:
 - 1. ACL 301 "Specifications for Structural Concrete for Buildings".
 - 2. ACI 318 "Building Code Requirements for Reinforced Concrete"
 - 3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".
- B. Concrete Testing Service: The **Owner** will engage and pay a testing laboratory to perform material evaluation tests.
- C. Materials and installed work may require retesting, as directed by Architect, at anytime during progress of work. Provide free access to material stockpiles and facilities. Retesting of rejected materials and installed work, shall be done at Contractor's expense.

1.4 SUBMITTALS

- A. Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, joints systems, curing compounds, dry-shake finish materials and others as requested by Architect.
- B. Shop Drawings Reinforcements: Submit shop drawings for fabrication, bending and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement.
- C. Material Certificates: Provide materials certificates in lieu of materials laboratory test reports when permitted by Architect. Material certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.
- B. Use plywood complying with U. S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.
- C. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two (2) edges and one (1) side for tight fit.

- D. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed, unless otherwise noted.
- B. Steel Wire: ASTM A 82, plain, cold-drawn, steel.
- C. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.
- D. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications, unless otherwise acceptable.
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For exposed to view concrete surfaces, where legs of supports are in contact with forms, provide support with legs which are plastic protected (CRSI, Class I) or stainless steel protected (CRSI, Class 3).

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type 1, unless otherwise acceptable to Architect.
 - 1. Use one brand of cement throughout project, unless otherwise acceptable to Architect.
- B. Normal Weight Aggregate: ASTM C 33, and as herein specified. Provide aggregate from a single source for all concrete.
 - 1. Do not use fine or coarse aggregates containing spalling-causing deleterious substances.
- C. Water: Drinkable.
- D. Air-Entraining Admixture: ASTM C 260.
 - 1. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - a. Air-Mix, Evclid Chemical Co.
 - b. Sika-Ai", Sika Corp.
 - c. Darex AEA, W. R. Grace
 - d. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- E. Water-Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E, and containing not more than 0.1% chloride ions.
 - 1. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - a. Accelguard 80; Euclid Chemical Company
 - b. Pozzolith High Gally; Master Builders
 - c. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- F. Water-Reducing, Retarding Admixture: ASTM C 494, Type D, and contain not more than 0.1% chloride ions.
 - 1. MANUFACTURERS: The following manufacturers' products have been used to establish

minimum standards for materials, workmanship and function:

- a. Edoco 20006; Edoco Technical Products
 - b. Pozzolith 300-R; Master Builders
 - c. Eucon Retarder 75; Euclid Chemical Company
 - d. Daratard; W. R. Grace
 - e. Plastiment; Sika Chemical Company
 - f. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- G. Certification: Provide admixture manufacturer's written certification that chloride ion content complies with specified requirements.
- H. Calcium chloride or admixtures containing more than 0.1% chloride ions are not permitted.

2.4 RELATED MATERIALS

- A. Moisture Barrier: Provide moisture barrier cover over prepared base material where indicated. Use only materials which are resistant to decay when tested in accordance with ASTM E 154, as follows:
1. Polyethylene sheet not less than 10 mils thick.
- B. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
- C. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
1. Waterproof paper
 2. Polyethylene film.
 3. Polyethylene-coated burlap.
- D. Liquid Membrane Forming Curing Compound: Liquid type membrane forming curing compound complying with ASTM C 309, Type 1-D, Class A unless other type acceptable to Architect. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal. Equal to "Kure-N-Seal" - 30; Sonneborn-Contech
1. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - a. Master Builders
 - b. Euclid Chemical Company
 - c. A.C. Horn
 - d. The Burke Company
 - e. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- E. Bonding Compound: Polyvinyl acetate or acrylic base, re-wettable type.
1. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - a. Welcrete; Larsen Products
 - b. EucoWeld; Euclid Chemical Company
 - c. Hornweld; A. C. Horn
 - d. Sonocrete; Sonneborn-Contech

- e. Acrylic Bondcrete; The Burke Company
 - f. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- F. Epoxy Adhesive: ASTM C 881, two component material suitable for use on dry or damp surfaces. Provide material "Type", "Grade", and "Class" to suit project requirements.
- 1. MANUFACTURERS: The following manufacturers' products have been used establish minimum standards for materials, workmanship and function:
 - a. Epoxitite; A. C. Horn
 - b. Sikadur Hi-Mod; Sika Chemical Corporation
 - c. Euco Epoxy 463 or 615; Euclid Chemical Company
 - d. Patch and Bond Epoxy; The Burke Company
 - e. Sure-Poxy; Kaufman Products, Inc.
 - f. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- G. Subfloor Patching and Leveling: The following manufacturers' products have been used establish minimum standards for materials, workmanship and function:
- 1. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - a. Ardex K-15; Ardex Engineered Cements 400 Ardex Park Drive Aliquippa, PA 15001; (724) 203-5000
 - b. Equal products of other manufacturers may be used in the work, provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

PART 3 - EXECUTION

3.1 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.
- B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.
- C. Design mixes to provide normal weight concrete as indicated on drawings and schedules.
- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.
- E. Admixtures:
 - 1. Use water-reducing admixture in all concrete for ease of placement and workability.
 - 2. Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 degrees F.

3. Use air-entraining admixture in all concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content of 6% with a tolerance of plus-or-minus 1-1/2%.
- F. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
1. Ramps, slabs and sloping surfaces: 3" to 5".
 2. Reinforced foundation systems: 2" to 5".
 3. Other concrete: 3" to 5".

3.2 CONCRETE MIXES

- A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.
1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.
 2. When air temperature is between 85 degrees F and 90 degrees, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

3.3 FORMS

- A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.
- B. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.
- C. Construct forms to sizes, shapes, lines and dimensions shown and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, off-sets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
- D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses and the like, to prevent swelling and for easy removal.
- E. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set time to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.
- F. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- G. Form Ties: Factory-fabricated, adjustable-length, removable, or snap-off metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.
1. Unless otherwise indicated, provide ties so portion remaining within concrete after removal is 1" inside concrete and will not leave holes larger than 1" diameter in concrete surface.
- H. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.
- I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten

forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

3.4 PLACING REINFORCEMENT

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars" for details and methods of reinforcement placement and supports, and as herein specified.
- B. Clean reinforcement of loose rust and mill scale, earth, ice and other materials which reduce or destroy bond with concrete.
- C. Accurately position, support and secure reinforcement against displacement by formwork, construction or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers as required.
- D. Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3.5 JOINTS

- A. Construction Joints: Locate and install construction joints as indicated, or if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Architect.
 - 1. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints.
- B. Isolation Joints in Slabs-On-Ground: Construct isolation joints in slabs-on-ground at points of contact between slabs on ground and vertical surfaces, such as column pedestals, and elsewhere as indicated.
 - 1. Joint filler and sealant materials are specified in Division-7 sections of these specifications.
- C. Construction Joints in Slabs-On-Ground: Construct construction joints in slabs-on-ground to form panels of patterns no larger than 600 square feet and as shown and as detailed. An alternative control joint detail may be inserts 1/8" to 1/4" wide x 1/4 of slab depth.
 - 1. Form contraction joints by inserting premolded plastic, hardboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris, fill groove with joint sealant.
 - 2. Joint sealant material is specified in Division-7 sections of these specifications.

3.6 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.
- B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface.
 - 1. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.

3.7 PREPARATION OF FORM SURFACES

- A. Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.

- B. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.
- C. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

3.8 CONCRETE PLACEMENT

- A. Replacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.
 - 1. Coordinate the installation of joint materials and moisture barriers with placement of forms and reinforcing steel.
- B. General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete", and as herein specified.
 - 1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
- C. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
 - 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.
 - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.
- D. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
 - 1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Bring slab surfaces to correct level with straightedge and strike-off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 - 3. Maintain reinforcing in proper position during concrete placement operations.
- E. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.
 - 1. When air temperature has fallen to or is expected to fall below 40 degrees F uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F. and not more than 80 degrees F at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not place concrete when air temperature has fallen to or is expected to fall below 35 °F. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.

F. Hot Weather Placing:

1. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACE 305 and as herein specified.
2. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 degrees F. Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
3. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
4. Fog spray forms, reinforcing steel and subgrade just before concrete is placed.
5. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

3.9 FINISH OF FORMED SURFACES

- A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaces or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete such as waterproofing, dampproofing. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.
- C. Smooth Rubbed Finish: For formed concrete surfaces exposed to view provide smooth rubbed finish, not later than one day after form removal.
 1. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.10 MONOLITHIC SLAB FINISHES

- A. Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E 1155/E 1155M for randomly trafficked floor surfaces:
 1. Specified overall values of flatness, F(F) 38: and levelness, F(L) 25: with minimum local values of flatness, F(F) 19: levelness, F(L) 13: for slabs on grade.
- B. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo and other bonded applied cementitious finish flooring material, and as otherwise indicated.
- C. Slope surface uniformly to drains where required. After leveling, roughen surfaces before final set, with stiff brushes, brooms or rakes.
- D. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other

finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing membrane or elastic roofing, or sand-bend terrazzo, and as otherwise indicated.

1. After screeding consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
- E. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint or other thin film finish coating system.
 1. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance. Grind smooth surface defects which would telegraph through applied floor covering system.
- F. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps and ramps and elsewhere as indicated.
 1. Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.11 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
 1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Keep continuously moist for not less than 7 days.
 2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least seven (7) days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.
- B. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.
 1. Provide moisture curing by one of the following methods or by a combination of the following methods:
 - a. Keep concrete surface continuously wet by covering with water.
 - b. Continuous water-fog spray.
 - c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.
- C. Provide moisture-cover curing as follows:
 1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
- D. Provide curing and sealing compound to interior slabs with resilient flooring, carpet over cushion, or left exposed; and to exterior slabs, walks, and curbs as follows:
 1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within two hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected

to heavy rainfall within three (3) hours after initial application. Maintain continuity of coating and repair damage during curing period.

- E. Do not use membrane curing compounds on surface which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, damp-proofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting and other coatings and finish materials, unless otherwise acceptable to Architect.
- F. Curing Formed Surfaces: Cure formed concrete surfaces, by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- G. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.
- H. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.
- I. Sealer and Dust-proofer: Apply a second coat of specified curing and sealing compound only to surfaces given a first coat.

3.12 REMOVAL OF FORMS

- A. Formwork not supporting weight of concrete, such as sides of walls, and similar parts of the work, may be removed after cumulatively curing at not less than 50 degrees F for twenty-four (24) hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided cutting and protection operations are maintained.
- B. Formwork supporting weight of concrete, may not be removed in less than fourteen (14) days and until concrete has attained design minimum compressive strength of in place concrete by testing field-cured specimens representative of concrete location in members.
- C. Form facing material may be removed four (4) days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

3.13 RE-USE OF FORMS

- A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

3.14 MISCELLANEOUS CONCRETE ITEMS

- A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.
- D. Reinforced Masonry: Provide concrete grout for reinforced masonry, masonry lintels and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.

3.15 CONCRETE SURFACE REPAIRS

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CAST-IN-PLACE CONCRETE
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- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms when acceptable to Architect.
1. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.
 2. For exposed to view surfaces, blend white portland cement and standard portland cement so that when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- B. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.
1. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
- C. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness using a template having required slope.
1. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets and other objectionable conditions.
 2. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
 3. Correct low areas in unformed surfaces during, or immediately after, completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.
 4. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and exposed reinforcing steel with at least 3/4" clearance all around.
 5. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 6. Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than seventy-two (72) hours.
 7. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.
 8. Repair methods not specified above may be used, subject to acceptance of Architect.

3.16 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. The Owner will employ and pay for a testing laboratory to perform tests and to submit test reports. The Contractor shall notify testing agency 24 hours in advance of requirements.
- B. Sampling and testing for quality control during placement of concrete may include the following, as directed by Architect.
- C. The Owner shall maintain equipment on site to cast cylinders, perform slump and air tests, and field cure specimens. Should the project testing agency be absent from the site, the Contractor will be responsible for performing the field tests below.
- D. Sampling Fresh Concrete: ASTM C 172, except as modified for slump to comply with ASTM C 94.
 - 1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
 - 2. Concrete Temperature: Test hourly when air temperature is 40 degrees F. and below, and when 80 degrees F. and above; and each time a set of compression test specimens made.
 - 3. Compression Test Specimen: ASTM C 31; one set of four (4) standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
- E. Compressive Strength Tests: ASTM C 39; one set for each day's pour plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at seven (7) days, two specimen tested at twenty-eight (28) days, and one specimen retained in reserve for later testing if required. Minimum compressive strength of concrete shall be 3,000 psi at 28 days unless otherwise indicated.
 - 1. When frequency of testing will provide less than five (5) strength tests for a given class of concrete, conduct testing from at least five (5) randomly selected batches or from each batch if fewer than five (5) are used.
 - 2. When total quantity of a given class of concrete is less than 50 cu. yds., strength test may be waived by Architect if, in his judgment, adequate evidence of satisfactory strength is provided.
 - 3. When strength of field-cured cylinders is less than 85% of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
 - 4. Test results shall be reported in writing to Architect and Contractor within twenty-four (24) hours that tests are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at twenty-eight (28) days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.
- F. Nondestructive Testing: Impact hammer, sonoscope, or other non- destructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- G. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.
 - 1. Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.

END OF SECTION

SECTION 03950 - CONCRETE SEALER

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Exposed concrete slabs where concrete sealer is indicated.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: Submit four samples of concrete sealer over concrete, 6 by 6 inches sample.
- C. Manufacturer Certificates: Signed by manufacturers certifying that concrete sealer comply with requirements.
- D. Qualification Data: For Installer.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for assemblies.
- F. Warranty: Special warranty specified in this Section.
- G. Maintenance data.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer with minimum five years documented experience.

1.4 PROJECT CONDITIONS

- A. Limitations: Proceed with application only when the following existing substrate conditions permit sealer to be applied according to manufacturers' written instructions and warranty requirements:
 - 1. Ambient temperature is above 40 deg F.
 - 2. Concrete surfaces and mortar have cured for more than 28 days.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer and Applicator agree to repair or replace materials that fail to maintain water repellency within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CONCRETE SEALER

- A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; colorless; that penetrates, hardens, and densifies concrete surfaces.
 - 1. Products:
 - a. Curecrete Distribution Inc.; Ashford Formula.
 - b. Burke by Edoco; Titan Hard.

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- c. ChemMasters; Chemisil Plus.
 - d. Euclid Chemical Company (The); Euco Diamond Hard.
- 2. Flammability: Self extinguishing.
- 3. Finish: Non slip finish. Coefficient of friction: 0.6 wet, 0.8 dry.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrate of substances that might interfere with penetration or performance of concrete sealer.
 - 1. Concrete: Remove oil, curing compounds, laitance, and other substances that could prevent adhesion or penetration of concrete sealer.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATION

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect the substrate before application of concrete sealer and to instruct Applicator on the product and application method to be used.
- B. Concrete Sealer: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
 - 1. Do not apply to concrete that is less than number of days' old recommended by sealer manufacturer in writing.
 - 2. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.
- C. Apply on horizontal surfaces of indicated interior exposed concrete slabs not receiving other finishes.

3.3 CLEANING

- A. Immediately clean concrete sealer from adjoining surfaces and surfaces soiled or damaged by concrete sealer application as work progresses. Repair damage caused by concrete sealer application. Comply with manufacturer's written cleaning instructions.

END OF SECTION

SECTION 04200 - UNIT MASONRY

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. Extent of each type of masonry work is indicated on drawings and schedule.
- B. Types of masonry work required include.
 - 1. Concrete unit masonry.
 - 2. Brick masonry.

1.3 QUALITY ASSURANCE

- A. Fire Performance Characteristics: Where indicated, provide materials and construction which are identical to those of assemblies whose fire endurance has been determined by testing in compliance with ASTM E 119 by a recognized testing and inspecting organization or by another means, as acceptable to authority having jurisdiction.
- B. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
- C. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
- D. Samples: Submit the following samples:
 - 1. Unit masonry samples for each type of exposed masonry unit required; include in each set the full range of exposed color and texture to be expected in completed work.
 - 2. Include size variation data verifying that actual range of sizes for brick falls within ASTM C652 dimension tolerances for brick where modular dimensioning is indicated. The grade shall be SW and the type HBS.
- E. Field Constructed Mock-Up Panel: Prepare mock-up panel for the following types of masonry. Purpose of mock-up is further verification of selections made for color and finish under sample submittals and establishing standard of quality for aesthetic effects expected in completed work. Build mock-up panel to comply with the following requirements:
 - 1. Locate mock-up panel on site where directed by the Architect.
 - 2. Build mock-up panel of typical exterior masonry wall, approximately 4'-0" long by 4'-0" high, showing all typical components, connections, attachments to building structure and methods of installation.
 - 3. Retain mock-up panel during construction as standard for judging completed masonry work. When directed, demolish mock-up panel and remove from site.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes. Store masonry units off the ground.
- C. Store cementitious materials off the ground, under cover and in dry location.

- D. Store aggregates where grading and other required characteristics can be maintained.
- E. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

1.5 PROJECT CONDITIONS

- A. Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.
- B. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- C. Do not apply uniform floor or roof loading for at least 24 hours after building masonry walls or columns.
- D. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.
- E. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
- F. Protect sills, ledges and projections from droppings of mortar.
- G. Environmental Protection:
 - 1. Maintain air temperature and materials to a minimum of 40 degrees F and a maximum of 90 degrees F prior to and during masonry work
 - 2. Do not lay masonry units which are wet or frozen.
 - 3. Remove masonry damaged by freezing conditions.
- H. For clay masonry units with initial rates of absorption (suction) which require them to be wetted before laying, comply with the following requirements.
 - 1. For units with surface temperatures above 32°F wet with water heated to above 70°F.
 - 2. For units with surface temperatures below 32°F wet with water heated to above 130°F.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

- A. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.
 - 1. Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.
 - 2. Provide bullnose units for outside corners, except where indicated as square-edged.
- B. Concrete Block: Provide units complying with characteristics indicated below for Grade, Type, face size, exposed face and under each form of block included, for weight classification.
 - 1. Grade N
 - 2. Size: Manufacturer's standard units with nominal face dimensions of 16" long x 8" high x thickness indicated.
 - 3. Type I: moisture-controlled units.
 - 4. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.
 - 5. Hollow Loadbearing Block: ASTM C 90 and as follows:
 - a. Weight Classification: Lightweight
 - 6. All CMU sills shall be bullnose concrete block, unless another material is indicated on the drawings. If the sills are indicated to receive another material (ie: Solid Surface fabrication,

wood, etc.) placed on top of the CMU sill, the CMU sill shall be straight edged concrete block units.

2.2 BRICK MADE FROM CLAY OR SHALE

- A. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. ACME Brick Company, Montgomery, AL
 - 2. Boral Bricks, Phenix City, AL
 - 3. Henry Brick Company, Selma, AL
 - 4. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- B. General: Comply with referenced standards and other requirements indicated below applicable to each form of brick required.
- C. Provide special molded shapes where indicated and for application requiring brick of form, size and finish on exposed surfaces which cannot be produced from standard brick sizes by sawing.
- D. For sills, caps and similar applications resulting in exposure of brick surfaces which otherwise would be concealed from view, provide uncured or unfrosted units with all exposed surfaces finished.
- E. Facing Brick: Submit samples for approval of equals prior to bids. Eased edge brick shall not be allowed.
- F. BRICK ALLOWANCES
 - 1. *Face Brick* shall have a value of **\$450.00 dollars per thousand** (Allowances shall be for material only, based on actual number of bricks purchased for the project. Installation, profit, overhead, shipping and taxes shall be included in the Contractors Bid Proposal). If Architect chooses brick of lesser value after Bid Process, Contractor shall issue a deductive Change Order for the difference.
 - 2. *Accent Brick* shall have a value of **\$450.00 dollars per thousand** (Allowances shall be for material only, based on actual number of bricks purchased for the project. Installation, profit, overhead, shipping and taxes shall be included in the Contractors Bid Proposal). If Architect chooses brick of lesser value after Bid Process, Contractor shall issue a deductive Change Order for the difference.

2.3 MORTAR AND GROUT MATERIALS

- A. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Atlas
 - 2. Citadel
 - 3. Lone Star
 - 4. Magnolia
 - 5. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- B. Masonry Cement: ASTM C 91.
 - 1. Type S for CMU walls
 - 2. Type N for Exterior Face and Accent brick – color pigment.

3. Type N for Architectural Stone Veneer – color pigment.

C. ALLOWANCES:

1. *Face and Accent Brick* to have a value of **\$17.00 dollars per bag**. (Allowances shall be for material only, based on actual number of bags purchased for the project. Installation, profit, overhead, shipping and taxes shall be included in the Contractors Bid Proposal). If Architect chooses mortar of lesser value after Bid Process, Contractor shall issue a deductive Change Order for the difference.
2. **Architectural Stone Veneer** to have a value of **\$17.00 dollars per bag**. (Allowances shall be for material only, based on actual number of bags purchased for the project. Installation, profit, overhead, shipping and taxes shall be included in the Contractors Bid Proposal). If Architect chooses mortar of lesser value after Bid Process, Contractor shall issue a deductive Change Order for the difference.

D. Hydrated Lime: ASTM C 207, Type S.

E. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4" use aggregate graded with 100% passing the No. 16 sieve.

F. Water: Clean and potable.

2.4 JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES

A. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

1. Dur-O-Wall, Inc.
2. Heckman Building Products, Inc.
3. Masonry Reinforcing Corp. of America.
4. National Wire Products Corp.
5. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

B. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics.

C. Use individual galvanized steel metal ties installed in horizontal joints to bond wythes together

only where wood or metal stud backup occurs. Provide ties as shown, but not less than one metal tie for 4 sq. ft. of wall area spaced not to exceed 24" o.c. horizontally and vertically. Stagger ties in alternate courses. Provide additional ties within 1'-0" of all openings and space not more than 3'-0" apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24" o.c. vertically.

D. Hot-Dip Galvanized Steel Wire: ASTM A 82 for uncoated wire and with ASTM A 123, Class B-2 (1.5 oz. per sq. ft. of wire surface) for zinc coating applied after prefabrication into units.

E. Application: Use where indicated.

F. Joint Reinforcement: Provide truss-type, welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10', with prefabricated corner and tee units, and complying with requirements indicated below:

1. Width: Fabricate joint reinforcement in units with widths of approximately 2" less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8" on joint faces exposed to exterior and 1/2" else- where.

2.5 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing, where flashing is exposed or partly exposed and where indicated, complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

1. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet.
 2. Provide splice plates at joints of formed, smooth metal flashing.
 3. Fabricate through-wall metal flashing embedded in masonry from, with ribs at 3-inch intervals along length of flashing to provide an integral mortar bond.
 4. Fabricate through-wall flashing with snaplock receiver on exterior face where indicated to receive counterflashing.
 5. Fabricate through-wall flashing with drip edge where indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees.
 6. Fabricate through-wall flashing with sealant stop unless otherwise indicated. Fabricate by bending metal back on itself 3/4 inch at exterior face of wall and down into joint 3/8 inch to form a stop for retaining sealant backer rod.
 7. Fabricate metal drip edges and sealant stops for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches into wall with hemmed inner edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam will shed water.
 8. Metal Drip Edges: Fabricate from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees.
 9. Metal Flashing Terminations: Fabricate from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 3/8 inch to form a stop for retaining sealant backer rod.
 10. Metal Expansion-Joint Strips: Fabricate from stainless steel to shapes indicated.
- B. Flexible Flashing: For flashing not exposed to the exterior, use one of the following, unless otherwise indicated:
1. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy as follows:
 - a. Monolithic Sheet: Elastomeric thermoplastic flashing, 0.040 inch thick.
 - b. Self-Adhesive Sheet: Elastomeric thermoplastic flashing, 0.025 inch thick, with a 0.015-inch thick coating of rubberized-asphalt adhesive.
 - c. Self-Adhesive Sheet with Drip Edge: Elastomeric thermoplastic flashing, 0.025 inch thick, with a 0.015-inch thick coating of rubberized-asphalt adhesive. Where flashing extends to face of masonry, rubberized-asphalt coating is held back approximately 1-1/2 inches from edge.
 - d. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.
 2. EPDM Flashing: Sheet flashing product made from ethylene-propylene-dieneterpolymer, complying with ASTM D 4637, 0.040 inch thick.
- C. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.
- D. MANUFACTURERS: The following manufacturers' products have been used to establish minimum standards for materials, workmanship, and function:
1. Vinyl Sheet Flashing: (Thickness: 20 mils)
 - a. Vi-Seal Plastic Flashing; Afco Products, Inc.
 - b. BFG Vinyl Water Barrier; B.F. Goodrich Co.
 - c. Nuflex; Sandell Manufacturing Co., Inc.

- d. Wascosea"; York Manufacturing, Inc.
- e. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.6 MISCELLANEOUS MASONRY ACCESSORIES

- A. See drawings for locations of all required control joints.**
- B. Non-Metallic Expansion Joint Strips:** Pre-molded, flexible cellular neoprene rubber filler strips complying with ASTM D 1056, Grade RE41E1, capable of compression up to 35%, of width and thickness indicated.
- C. Premolded Control Joint Strips:** Material as indicated below designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
 - 1. Polyvinyl chloride complying with ASTM D 2287, General Purpose Grade, Designation PVC-63506.
- D. Bond Breaker Strips:** Asphalt-saturated organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- E. Cavity Drainage Material:** Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Mortar Net Solutions; Mortar Net with Insect Barrier or comparable product by one of the following:
 - a. Advanced Building Products Inc.
 - b. Heckmann Building Products, Inc.
 - c. Wire-Bond.
 - 2. Configuration: Provide one of the following:
 - a. Strips, full depth of cavity and 10 inches (250 mm) high, with dovetail-shaped notches 7 inches (175 mm) deep that prevent clogging with mortar droppings.

2.7 MASONRY CLEANERS

- A. Job-Mixed Detergent Solution:** Solution of trisodium phosphate (1/2 cup dry measure) and laundry detergent (1/2 cup dry measure) dissolved in one gallon of water.

2.8 MORTAR AND GROUT MIXES

- A. General:** Do not add admixtures including air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
- B. Mixing:** Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.
- C. Mortar for Unit Masonry:** Comply with ASTM C 270, Proportion Specification, for types of mortar required, unless otherwise indicated.
 - 1. For Exterior Brick, use Type N mortar, equal to Flamingo, Blue Circle or Lehigh.
 - 2. For Other Masonry Units use Type S mortar without coloring pigment.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Wetting Clay Brick:** Wet brick made from clay or shale which have ASTM C 67 initial rates of absorption (suction) of more than 30 grams per 30 sq. in. per minute. Use wetting methods which ensure each clay masonry unit being nearly saturated but surface dry when laid.

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- B. Do not wet concrete masonry units.
- C. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.
- D. Thickness: Build cavity and composite walls, floors and other masonry construction to the full thickness shown. Build single wythe walls (if any) to the actual thickness of the masonry units, using units of nominal thickness indicated.
- E. Build chases and recesses as shown or required for the work of other trades. Provide not less than 8" of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.
- F. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
- G. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.
 - 1. Use wet cutting saws to cut concrete masonry units.

3.2 LAYING MASONRY WALLS

- A. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, jambs and wherever possible at other locations.
- B. Coursing and Bonding:
 - 1. **All CMU shall be Stack Bond unless otherwise indicated on structural drawings.**
- C. Stopping and Resuming Work: Rack back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.
- D. Built-in Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.
 - 1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.

3.3 MORTAR BEDDING AND JOINTING

- A. Lay masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.
- B. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.
- C. Maintain joint width shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.
- D. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.
- E. Tool all exposed joints, except where otherwise indicated, slightly concave using a jointer larger than joint thickness, unless otherwise indicated.
- F. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

3.4 STRUCTURAL BONDING OF MULTI-WYTHER MASONRY

- A. Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bond tie between wythes. Install at not more than 16" o.c. vertically.
- B. Corners: Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.
 - 1. For horizontally reinforced masonry, provide continuity at corners with prefabricated "L" units, in addition to masonry bonding.
- C. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, provide same type of bonding specified for structural bonding between wythes and space as shown below:
 - 1. At juncture of interior partitions and exterior walls, rake and caulk vertical joint.
 - 2. Provide metal ties as shown below.
 - 3. Provide individual metal ties at not more than 16" o.c. vertically.
 - 4. Provide continuity with horizontal joint reinforcement using prefabricated "T" units.
- D. Intersecting Load-bearing Walls: If carried up separately, block or tooth vertical joint with 8" maximum offsets and provide rigid steel anchors spaced not more than 4'-0" o.c. vertically, or omit blocking and provide rigid steel anchors at not more than 2'-0" o.c. vertically. Form anchors of galvanized steel not less than 1-1/2" x 1/4" x 2'-0" long with ends turned up not less than 2" or with cross-pins. If used with hollow masonry units, embed ends in mortar-filled cores.
- E. Non-bearing Interior Partitions: Build full height of story to underside of roof structure above, unless otherwise shown.

3.5 CAVITY WALLS

- A. Keep cavity clean of mortar droppings and other materials during construction. Strike joints facing cavity flush.
- B. Tie exterior wythe to new back-up with continuous horizontal joint reinforcing, installed in mortar joints at not more than 16" o.c. vertically.
- C. Provide weep holes (Open Head Joints) in exterior wythe of cavity wall located as directed on the drawings, spaced 32" o.c., unless otherwise indicated.

3.6 CAVITY WALL INSULATION

- A. On units of plastic insulation, install small pads of adhesive spaced approximately 1'-0" o.c. both ways on inside face. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
 - 1. Fill all cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.7 HORIZONTAL JOINT REINFORCEMENT

- A. General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls, 1/2" elsewhere. Lap reinforcing a minimum of 6".
- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Reinforce walls with continuous horizontal joint reinforcing unless specifically noted to be omitted.
- D. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening except at control joints.
 - 1. In addition to wall reinforcement, provide additional reinforcement at openings as required to comply with the above.

3.8 CONTROL AND EXPANSION JOINTS

- A. General: Provide vertical and horizontal expansion, control and isolation joints in masonry where shown. Build-in related items as the masonry work progresses.

3.9 LINTELS

- A. Install steel lintels where indicated.
- B. Provide masonry lintels where shown and wherever openings of more than 1'-0" for brick size units and 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide formed-in-place masonry lintels. Temporarily support formed-in-place lintels.
- C. Provide minimum bearing of 8" at each jamb, unless otherwise indicated.

3.10 FLASHING OF MASONRY WORK

- A. General: Provide concealed flashing in masonry work at, or above shelf angles, lintels, ledges and other obstructions to the down-ward flow of water in the wall so as to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with mastic before covering with mortar. Extend flashings through exterior face of masonry and turn down to form drip.
- B. Extend flashing the full length of lintels and shelf angles and minimum of 4" into masonry each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4", and through the inner wythe to within 1/2" of the interior face of the wall in exposed work. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2". At heads and sills turn up ends not less than 2" to form a pan.
- C. Interlock end joints of deformed metal flashings by over-lapping deformations not less than 1-1/2" and seal lap with elastic sealant.
- D. Install flashing to comply with manufacturer's instructions.
- E. Provide weep holes (open head joints) in the head joints of the first course of masonry immediately above concealed flashings. Space weep holes 32" o.c., unless otherwise indicated.

3.11 REPAIR, POINTING AND CLEANING

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point- up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.
- C. Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film or waterproof masking tape.
 - 4. Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clean water.
 - 5. Use bucket and brush hand cleaning method described in BIA "Technical Note No. 10 Revised" to clean brick masonry made from clay or shale, except use masonry cleaner indicated below.

- a. Detergent
- 6. Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins.

END OF SECTION

SECTION 04720 - ARCHITECTURAL CAST STONE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Architectural Cast Stone.
- B. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

1.2 RELATED SECTIONS

- A. Section 04200 – Unit Masonry.
- B. Section 04220 – Architectural Stone Veneer.
- C. Section 07900 – Joint Sealer.

1.3 REFERENCES

- A. ASTM A 615/A 615M - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- B. ASTM A767/A767M - Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
- C. ASTM C 33 - Concrete Aggregates.
- D. ASTM C 150 - Portland Cement.
- E. ASTM C 173 - Air Content of Freshly Mixed Concrete by the Volume Method
- F. ASTM C 231 - Air Content of Freshly Mixed Concrete by the Pressure Method
- G. ASTM C 260 - Specification for Air Entrained Admixtures for Concrete
- H. ASTM C 270 - Mortar for Unit Masonry.
- I. ASTM C 426 - Linear Drying Shrinkage of Concrete Masonry Units.
- J. ASTM C 494 - Chemical Admixtures for Concrete.
- K. ASTM C 618 - Coal Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Concrete
- L. ASTM C 666 - Resistance of Concrete to Rapid Freezing and Thawing.
- M. ASTM C 979 - Pigments for Integrally Colored Concrete.
- N. ASTM C 989 - Ground Granulated Blast- Furnace Slag for use in Concrete
- O. ASTM C 1194 - Compressive Strength of Architectural Cast Stone.
- P. ASTM C 1195 - Absorption of Architectural Cast Stone.
- Q. ASTM C 1364 - Architectural Cast Stone.

- R. Cast Stone Institute Technical Manual (Current Edition).
- S. ACI 530 "Building Code Requirements for Masonry Structures"

1.4 DEFINITIONS

- A. Cast Stone: An architectural stone unit manufactured to copy fine grain texture and color of natural cut stone used in unit masonry applications. Meets ASTM C 1364 requirements.
 - 1. Dry Cast Concrete Products: Manufactured from zero-slump concrete.
 - a. Vibrant Dry Hand Tamp Casting Method: Vibratory compaction by hand tamp of earth-moist, zero-slump concrete against rigid mold until it is densely compacted.
 - 2. Wet Cast Concrete Products: Manufactured from measurable slump concrete.
 - a. Wet Casting Method: Manufactured from measurable slump concrete and consolidated into a mold.

1.5 SUBMITTALS

- A. Comply with Section 01600 - Submittal Procedures.
- B. Product Data: Submit manufacturer's product data.
- C. Shop Drawings: Submit manufacturer's shop drawings, including profiles, cross sections, modular unit lengths, exposed faces, anchors and anchoring method recommendations (if required), and annotation of cast stone types and location.
- D. Samples: Submit pieces of manufacturer's cast stone units that represent general range of texture and color proposed to be furnished for project.
- E. Test Results:
 - 1. Submit manufacturer's test results from architectural cast stone units previously made by manufacturer using materials from same sources proposed for use in project.
- F. Manufacturer's Project References: Submit list of projects similar in scope, including project name and location, name of architect, and type and quantity of architectural stone veneer units installed.
- G. Warranty: Submit manufacturer's standard warranty.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Sufficient plant facilities to provide quality, shapes, quantities, and sizes of architectural stone veneer units required without delaying progress of the Work.
 - 2. Minimum of 10 years experience in producing masonry units or cast stone.
 - 3. Fabricating plant shall be certified by the Cast Stone Institute, National Precast Concrete Association, or equivalent certification program.
 - 4. Manufacturer shall have an internal Quality Assurance Testing Program with certified laboratory technician(s).
 - 5. Custom Cast Stone Series and Architectural Masonry Veneer Series are to be manufactured from a similar mix design to match color and texture.
- B. Mock-Ups: Provide full-size architectural cast stone units for use in construction of mock-ups. Approved mock-ups shall become the standard for appearance and workmanship for project.
 - 1. Mock-ups shall remain as part of the completed Work.

2. Mock-ups shall not remain as part of the completed Work. At Architect's direction, demolish mock-ups and remove debris.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery:
 1. Deliver architectural cast stone units secured to shipping pallets and protected from damage and discoloration.
 2. Provide itemized shipping list.
- B. Storage:
 1. Store architectural cast stone units and installation materials in accordance with manufacturer's instructions.
 2. Store architectural cast stone units on pallets with non-staining, waterproof covers.
 3. Do not double stack pallets.
 4. Ventilate units under covers to prevent condensation.
 5. Prevent contact with dirt and splashing.
- C. Handling:
 1. Protect architectural cast stone units, including corners and edges, during storage, handling, and installation to prevent chipping, cracking, staining, or other damage.
 2. Handle long units at center and both ends simultaneously to prevent cracking.
 3. Do not use pry bars or other equipment in a manner that could damage units.

1.8 SCHEDULING

- A. Schedule and coordinate production and delivery of architectural stone veneer units with unit masonry work.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Reading Rock, Inc., 4600 Devitt Drive, Cincinnati, Ohio 45246; Phone: (800) 482-6466 Fax: (513) 874-2361; www.readingrock.com; e-mail: info@readingrock.com
- B. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 ARCHITECTURAL CAST STONE

- A. Architectural Cast Stone: RockCast's Custom Cast Stone Series.
- B. Compliance: ASTM C 1364.
- C. Casting Method: Vibrant dry hand tamp or wet cast as specified and/or required.

- D. Texture: Smooth or otherwise as indicated on the drawings.
- E. Color: To be selected by Architect
- F. Units: As indicated on the drawings.
- G. Test Results:
 - 1. Compressive Strength, ASTM C 1194: Minimum 6,500 psi at 28 days.
 - 2. Absorption, ASTM C 1195: Maximum 6 percent, by the cold water method, at 28 days.
 - 3. Linear Shrinkage, ASTM C 426: Less than .065 percent.
 - 4. Density, ASTM C 140: Greater than 120 pounds per cubic foot.
 - 5. Freeze-Thaw, ASTM C 666: Less than 5 percent cumulative mass loss after 300 cycles.
 - 6. Air Content: ASTM C 173 or C 231 for wet cast product shall be 4-8% for units exposed to freeze-thaw environments; air entrainment is not required for VDT products.
- H. Curing: Cure in enclosed chamber at 100 percent relative humidity and minimum 90 degrees F for up to 16 hours and yard cure for a minimum of 3 days.

2.3 ARCHITECTURAL STONE VENEER MATERIALS

- A. Portland Cement: ASTM C 150, Type I or III. White and/or gray as required to match specified color.
- B. Coarse Aggregates: ASTM C 33, except for gradation. Granite, quartz, or limestone.
- C. Fine Aggregates: ASTM C 33, except for gradation. Manufactured or natural sands.
- D. Pigments: ASTM C 979, except do not use carbon black pigments. Inorganic iron oxide pigments.
- E. Admixtures:
 - 1. Water Reducing, Retarding, and Accelerating Admixtures: ASTM C 494.
 - 2. ASTM C 260 for air-entraining admixtures
 - 3. Other admixtures: integral water repellents and other chemicals, for which no ASTM Standard exists, shall be previously established as suitable for use in concrete by proven field performance or through laboratory testing.
 - 4. ASTM C 618 for mineral admixtures
 - 5. ASTM C 989 for ground granulated blast-furnace slag
- F. Water: Potable.
- G. Reinforcing Bars: ASTM A 615, deformed steel bars. Epoxy coated or galvanized when covered with less than 1-1/2 inches of material.
 - 1. Galvanized Coating: ASTM A 767.

2.4 TEXTURE AND COLOR

- A. General: Match texture and color of full-size sample on file with Architect.
- B. Texture of Surfaces Exposed to View:
 - 1. Fine-grained texture similar to natural stone.
 - 2. Approximately equal to approved sample when viewed in direct daylight at 10 feet.
- C. Surface Air Voids:
 - 1. Size: Maximum 1/32 inch.
 - 2. Density: Less than 3 occurrences per any 1 square inch.
 - 3. Viewing Conditions: Not obvious under direct daylight at 10 feet.

- D. Finish:
 - 1. Minor chips shall not be obvious under direct daylight at 20 feet, as determined by Architect.
- C. Color Variation:
 - 1. Viewing Conditions: Compare in direct daylight at 20 feet, between units of similar age, subjected to similar weathering conditions.
 - 2. Total Color Difference: ASTM C 1364, 6 units
 - 3. Hue Difference: ASTM C 1364, 2 units

2.5 MORTAR

- A. Mortar: ASTM C 270, Type N As specified in Section 04200.
- B. Mortar Materials: As specified in Section 04200.

2.6 ACCESSORIES

- A. Anchors: Non-corrosive type, sized for conditions. Hot-dip galvanized steel
- B. Sealant: As specified in Section 07900.
- C. Cleaner: Prosoco Sure Klean Custom Masonry Cleaner. * Note: Aggressive cleaners may remove too much of the concrete surface paste making some of the color to appear to be "stripped." Therefore, on darker units a less aggressive cleaner such as Prosoco's Light Duty Cleaner should be used to maintain color.

2.7 FABRICATION

- A. Shapes: As indicated on drawings.
 - 1. Suitable wash on exterior sills, copings, projecting courses, and units with exposed top surfaces.
 - 2. Drips on projecting units, wherever possible.

2.8 TOLERANCES

- A. General: Manufacture architectural cast stone units within tolerances in accordance with Cast Stone Institute Technical Manual, unless otherwise specified.
- B. Cross Section Dimensions: Do not deviate by more than plus or minus 1/8 inch from approved dimensions.
- C. Length of Units: Do not deviate by more than length/360 or plus or minus 1/8 inch, whichever is greater, not to exceed plus or minus 1/4 inch.
- D. Warp, Bow, or Twist: Do not exceed length/360 or plus or minus 1/8 inch, whichever is greater.

2.9 PRODUCTION QUALITY CONTROL

- A. Mix Designs: Test new and existing mix designs for applicable compressive strength and absorption compliance before manufacturing cast stone units.

- B. Plant Production Testing: Test compressive strength and absorption from specimens selected at random from plant production. Tests to be conducted by certified laboratory testing technicians.
1. Custom Cast Stone Units: Test in accordance with ASTM C 1194 and C 1195.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine construction to receive architectural cast stone units. Notify Architect if construction is not acceptable. Do not begin installation until unacceptable conditions have been corrected.
- B. Examine architectural cast stone units before installation. Do not install unacceptable units.
1. All RockCast products are shipped on a pallet and have one unfinished side. Textured units are to be set with the texture face forward and smooth units are stacked "face up" on the pallet.
 2. RockCast's Custom Cast Stone Series units do not have returns or finished ends unless otherwise ordered and noted on the shop drawings.

3.2 INSTALLATION

- A. Install units in conjunction with masonry, as specified in Section 04200.
- B. Pull units from multiple cubes during installation to minimize variation in color and help with natural blending.
- C. Cut units using motor-driven masonry saws. Finished ends should be turned to the visible side and the saw cut turned to the inside of the mortar joint to hide exposed aggregates and saw marks.
- D. Do not use pry bars or other equipment in a manner that could damage units.
- E. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.
- F. Use Type N mortar (ASTM C 270), unless specified otherwise.
- G. Per ACI 530.1, it is not necessary, nor recommended, to wet the units prior to installation.
- H. Set units in full bed of mortar, unless otherwise indicated on the drawings. It is not necessary to rake joints for later tuckpointing. Standard full mortar application with tooling is all that is necessary.
- I. Fill vertical joints with mortar.
- J. Leave head joints in copings and similar components open for sealant.
- K. Make joints 3/8 inch, unless otherwise indicated on the drawings.
- L. Mortar joints should have a slight concave profile (unless specified otherwise).
- M. Remove excess mortar immediately.
- N. Remove mortar fins and smears before tooling joints.
- O. Cover wainscot for protection and bond separation with plastic, felt paper or other approved products.
- P. Cover freshly installed masonry products as required to assist with the curing process.

- Q. Sealant Joints:
1. As specified in Section 07900.
 2. Prime ends of units, insert properly sized backing rod, and install sealant.
 3. Provide sealant joints at following locations:
 - a. Copings and cast stone units with exposed tops.
 - b. Joints at relieving angles.
 - c. Control and expansion joints.
 - d. As indicated on the drawings.

3.3 TOLERANCES

- A. Installation Tolerances:
1. Variation from Plumb: Do not exceed 1/8 inch in 5 feet or 1/4 inch in 20 feet or more.
 2. Variation from Level: Do not exceed 1/8 inch in 5 feet, 1/4 inch in 20 feet, or 3/8 inch maximum.
 3. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch or 1/4 of nominal joint width, whichever is greater.
 4. Variation in Plane between Adjacent Surfaces: Do not exceed 1/8-inch difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

3.4 CLEANING

- A. Clean exposed units after mortar is thoroughly set and cured.
- B. Perform test of cleaner on small area of 4' x 4' on each type and color and receive approval by Architect before full cleaning. Let test area dry 4 to 5 days before inspection. Keep test area for future comparison.
- C. Clean units by wetting down the surface first, before using the specified cleaner (as specified in Section 2.7.C). Brush on cleaner, let dwell for 2 to 3 minutes. Reapply cleaner, scrub surface with masonry brush and rinse off thoroughly. Areas with heavy soiling use a wood block or non-metallic scraper.
- D. Apply cleaner to units in accordance with cleaner manufacturer's instructions.
- E. Do **not** use the following to clean units:
1. Muriatic acid.
 2. Power washing.
 3. Sandblasting.
 4. Harsh cleaning materials or methods that would damage or discolor surfaces.

3.5 REPAIR

- A. Repair methods and results to be approved by Architect.

3.6 INSPECTION AND ACCEPTANCE

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

3.7 WATER REPELLANT

- A. Sealer: Prosoco Sure Klean Weather Seal Siloxane WB or PD or Hydrozo Enviroseal 7 according to manufacturer's recommendations. Apply water repellant for weatherproofing in accordance with water repellant manufacturer's instructions.
- B. Apply water repellant after installation, cleaning, repair, inspection, and acceptance of units are completed.

3.8 PROTECTION

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

END OF SECTION

SECTION 05310 - STEEL DECKING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Metal form deck.
- B. Corro form (Cement Fiber Decking)
- C. Bearing plates and angles.
- D. Stud shear connectors.

1.2 RELATED REQUIREMENTS

- A. Section 05120 - Structural Steel Framing: Support framing for openings larger than 18 inches and shear stud connectors.
- B. Section 05210 - Steel Joist Framing: Placement of embedded steel anchors for bearing plates and joist seats in cast-in-place concrete.

1.3 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished; 2013.
- C. ASTM A510/A510M - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel; 2013.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.
- E. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2015.
- F. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).
- G. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018.
- H. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; 2017.
- I. ICC-ES AC43 - Acceptance Criteria for Steel Deck Roof and Floor Systems; 2016.
- J. ICC-ES AC70 - Acceptance Criteria for Fasteners Power Driven into Concrete, Steel and Masonry Elements; 2016.
- K. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.
- L. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- M. UL (FRD) - Fire Resistance Directory; Current Edition.

1.4 QUALITY ASSURANCE

- A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.
- B. Field Quality Control:
 - 1. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
 - 2. Field welds will be subject to inspection.
 - 3. Testing agency will report inspection results promptly and in writing to Contractor and Architect.
 - 4. Remove and replace work that does not comply with specified requirements.

Site Improvements and Interior Alterations to
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Fairhope, Alabama

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5. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Cut plastic wrap to encourage ventilation.
- B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Steel Deck:
 1. Canam Steel Corporation/United Steel Deck; www.canam-construction.com/en/construction-products/steel-deck/
 2. Cordeck, Inc; www.cordeck.com
 3. Nucor-Vulcraft Group; www.vulcraft.com/#sle.
 4. CSI; www.versa-roof.com
 5. Epic Metals Corporation; www.epicmetals.com
 6. Substitutions: See Section 01600 - Product Requirements.

2.2 STEEL DECK

- A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
 1. Calculate to structural working stress design and structural properties specified.
 2. Maximum Lateral Deflection of Diaphragms: 1/500 of the height of the wall.
- B. Acoustical Roof Deck: Non-composite type, steel sheet with plain vertical flute faces perforated with 1/8 inch (3 mm) diameter holes staggered 3/8 inch (10 mm) on center:
 1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
 2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
 3. Minimum Base Metal Thickness: 22 gage, 0.0299 inch (0.76 mm).
 4. Nominal Height: As indicated on drawings. Otherwise, 1-1/2 inch (38 mm).
 5. Profile: Fluted; SDI NR.
 6. Formed Sheet Width: As indicated on drawings. Otherwise, 24 inch (600 mm).
 7. Side Joints: Lapped, welded.
 8. End Joints: Lapped, welded.
 9. Fire Resistance Classification: Comply with UL (FRD) Assembly Number if fire rated assembly is required.
- C. Roof Deck: Non-composite type, fluted steel sheet:
 1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
 2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
 3. Minimum Base Metal Thickness: As indicated on drawings. Otherwise, 22 gage, 0.0299 inch (0.76 mm).
 4. Nominal Height: As indicated on drawings.

5. Profile: Fluted; SDI NR.
 6. Formed Sheet Width: As Indicated on drawings.
 7. Side Joints: Lock seam or Mechanically Fastened.
 8. End Joints: Lapped, welded.
 9. Fire Resistance Classification: Comply with UL (FRD) Assembly Number if fire rated assembly is required.
- D. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:
1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
 2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
 3. Span Design: Double.
 4. Minimum Base Metal Thickness: As indicated on drawings. Otherwise, 22 gage, 0.0299 inch (0.76 mm).
 5. Nominal Height: As indicated on drawings. Otherwise, 1-1/2 inches (38 mm).
 6. Profile: Fluted; SDI NR.
 7. Formed Sheet Width: As indicated on drawings. Otherwise, 24 inch (600 mm).
 8. Side Joints: Lock seam.
 9. End Joints: Lapped, welded.
 10. Fire Resistance Classification Comply with UL (FRD) Assembly Number if fire rated assembly is required.
- E. Cellular Floor Deck: Composite floor deck equipped with bottom flat sheet.
1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
 2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
 3. Span Design: Multiple.
 4. Minimum Base Metal Thickness: As indicated on drawings. Otherwise, 22 gage, 0.0299 inch (0.76 mm).
 5. Nominal Height: As indicated on drawings. Otherwise, 1-1/2 inches (38 mm).
 6. Formed Sheet Width: As indicated on drawings. Otherwise, 24 inch (600 mm).
 7. Side Joints: Lapped, welded.
 8. End Joints: Lapped, welded.
 9. Fire Resistance Classification: Comply with UL (FRD) Assembly Number if fire rated assembly is required.
- F. Metal Form Deck: Corrugated Steel Sheet, with provision for ventilation of concrete:
1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
 2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
 3. Minimum Base Metal Thickness: As indicated on drawings. Otherwise, 22 gage, 0.0299 inch (0.76 mm).
 4. Nominal Height: As indicated on drawings. **Otherwise 1-1/2 inch. (38 mm).**

5. Formed Sheet Width: As Indicated on drawings.
6. Side Joints: Lapped, welded.
7. End Joints: Lapped, welded.

2.3 ACCESSORY MATERIALS

- A. Bearing Plates and Angles: ASTM A36/A36M steel, galvanized per ASTM A123/A123M.
- B. Stud Shear Connectors: Made from ASTM A108 Grade 1015 bars.
- C. Welding Materials: AWS D1.1/D1.1M.
- D. Fasteners: Galvanized hardened steel, self tapping.
- E. Powder Actuated Mechanical Fasteners: Steel; with knurled shank and forged ballistic point. Comply with applicable requirements of ICC-ES AC70.
 1. Design Requirements: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM) design method for roof deck and floor deck applications and ICC-ES AC43.
 2. Material: Steel; ASTM A510/A510M, Grade 1077.
 - a. Hardness: Rockwell C 54.5, minimum.
 - b. Tensile Strength: 285 kips per square inch, minimum.
 - c. Shear Strength: 175 kips per square inch, minimum.
 - d. Washers:
 - i. Steel Bar Joist Framing Applications: 0.472 inch diameter, minimum.
 - ii. Exposed Roof Deck Applications: 0.591 inch diameter, minimum.
 - e. Corrosion Resistance:
 - i. Steel Bar Joist Framing Applications: ASTM B633, SC1, Type III zinc electroplate.
- F. Mechanical Fasteners: Steel; hex washer head, self-drilling, self-tapping.
 1. Design Requirements for Sidelap Connections: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM)SDI design method for roof deck and floor deck applications and ICC-ES AC43.
 2. Fasteners for Steel Roof Decks Protected with Waterproofing Membrane: ASTM B633, SC1, Type III zinc electroplate.
 3. Fasteners for Exposed Steel Roof Deck Application: Manufacturer's standard stainless steel with bonded neoprene washer.
- G. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.
- H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
- I. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.

2.4 FABRICATED DECK ACCESSORIES

- A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 22 gage, 0.0299 inch (0.76 mm) thick sheet steel; of profile and size as indicated; finished same as deck.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions prior to beginning work.

3.2 INSTALLATION

- A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.
- B. On concrete and masonry surfaces provide minimum 4inch (100 mm) bearing.
- C. On Steel supports provide minimum 1-1/2 inch (38 mm) bearing.
- D. Fasten deck to steel support members at ends and intermediate supports at 12 inches on center maximum, parallel with the deck flute and at each transverse flute using methods specified.
 - 1. Welding: Use fusion welds through weld washers.
 - 2. Place and secure special deep fluted sections for integral concrete bridging.
- E. Clinch lock seam side laps.
- F. At mechanically fastened male/female side laps fasten at 24 inches on center maximum.
- G. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.
- H. At welded male/female side laps weld at 18 inches on center maximum.
- I. Weld deck in accordance with AWS D1.3/D1.3M.
- J. At deck openings from 6 inches to 18 inches in size, provide 2 by 2 by 1/4 inch steel angle reinforcement. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.
- K. At deck openings greater than 18 inches in size, provide steel angle reinforcement. as specified in Section 05500.
- L. Where deck (other than cellular deck electrical raceway) changes direction, install 6 inch minimum wide sheet steel cover plates, of same thickness as deck. Fusion weld 12 inches on center maximum.
- M. At floor edges, install concrete stops upturned to top surface of slab, to contain wet concrete. Provide stops of sufficient strength to remain stationary without distortion.
- N. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.
- O. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.
- P. Place metal cant strips in position and fusion weld.
- Q. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.
- R. Position floor drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.
- S. Weld stud shear connectors through steel deck to structural members below.
- T. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION

SECTION 05400 - COLD-FORMED METAL TRUSSES

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. This Section includes the following:
 - 1. Roof trusses.

1.3 DEFINITIONS

- A. Definition below is based on description of delivered minimum thickness in AISI's "Specification for the Design of Cold-Formed Steel Structural Members."
- B. Minimum Uncoated Steel Thickness: Minimum uncoated thickness of cold-formed framing delivered to the Project site shall be not less than 95 percent of the thickness used in the cold-formed framing design. Lesser thickness shall be permitted at bends due to cold forming.
- C. Producer: Entity that produces steel sheet coil fabricated into cold-formed members.

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide cold-formed metal framing members, connectors, and fasteners capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: As indicated.
- B. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
- C. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - 1. Upward and downward movement of 1/2 inch.
 - 2. Maximum live load deflection of 1/360 of span.
 - 3. Maximum total load deflection of 1/240 of span.
- D. Design roof trusses according to AISI's "Design Guide for Cold-Formed Steel Trusses."

1.5 SUBMITTALS

- A. Product Data: For each type of cold-formed metal framing product and accessory indicated.
- B. Shop Drawings: Show layout, spacing, sizes, thickness, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining Work.
- C. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Mill certificates signed by steel sheet producer indicating steel sheet complies with requirements.
- E. Welding Certificates: Copies of certificates for welding procedures and personnel.
- F. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- G. Fastener Test Reports: From a qualified testing agency indicating that each of the following fasteners comply with requirements, based on comprehensive testing of current products:

Site Improvements and Interior Alterations to
Fairhope High School for the
Baldwin County Public Schools
Fairhope, Alabama

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1. Power-actuated anchors.
 2. Self-drilling screws.
 3. Miscellaneous mechanical fasteners.
- H. Research/Evaluation Reports: Evidence of cold-formed metal framing's compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed cold-formed metal framing similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Engineering Responsibility: Engage a qualified professional engineer to prepare design calculations, Shop Drawings, connection details, and other structural data. The complete design of the trusses and all supplemental framing for the system shall be the responsibility of the supplier.
- C. 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 cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.
- D. Mill certificates signed by steel sheet producer indicating steel sheet complies with requirements, including uncoated steel thickness, yield strength, tensile strength, total elongation, chemical requirements, and galvanized-coating thickness.
- E. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
- F. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- G. Fire-Test-Response Characteristics: Where metal framing is part of a fire-resistance-rated assembly, provide framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- H. AISI Specifications: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" for calculating structural characteristics of cold-formed metal framing.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the work include, but are not limited to, the following:
1. Tennessee Building Components Inc. (Formerly Raney Truss Company); 41 Sevier lane, Decaturville, TN 38329; Ph.: 731.852.2552. <https://www.linkedin.com/company/tennessee-building-components/>
 2. Metal Truss, L.L.C.

- B. Metal Framing Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following:

1. Allied American Studco, Inc.
2. Angeles Metal Systems.
3. California Expanded Metal Products Co.
4. California Metal Systems, Inc.
5. Clark Steel Framing Industries.
6. Consolidated Fabricators Corp.
7. Consolidated Systems, Inc.
8. Dale Industries, Inc.
9. Design Shapes in Steel.
10. Knorr Steel Framing Systems.
11. MarinoWare; Div. of Ware Industries, Inc.
12. Scafco Corp.
13. Steel Construction Systems.
14. Steel Developers, LLC.
15. Steeler, Inc.
16. Studco of Hawaii, Inc.
17. Super Stud Building Products, Inc.
18. The Steel Network, Inc.
19. United Metal Products, Inc.
20. Western Metal Lath.

2.2 MATERIALS - ROOF TRUSSES

- A. Roof Truss Members: Fabricate top and bottom chords from unpunched sections that are symmetrical about the Y-Y axis. "C" Sections are not acceptable. Top and bottom cords shall be 18 gauge minimum. Web members shall be 20 gauge minimum.

2.3 MATERIALS - ANCHORS AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123.
- B. Power-Actuated Fastening Systems: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- C. Mechanical Fasteners: Corrosion-resistant-coated, self-drilling, self-threading steel drill screws.
- D. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- E. Welding Electrodes: Comply with AWS standards.

2.4 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 ASTM A 780.

2.5 FABRICATION

- A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
 - 4. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - 5. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
 - 6. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
 - 7. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
 - 8. Field Fabrication is NOT Allowed.
- B. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
 - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
- C. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Grout weld plate bearing surfaces uniform and level to ensure full contact of bearing flanges or track webs on supporting weld plate at masonry construction.

3.3 INSTALLATION, GENERAL

- A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed metal framing according to ASTM C 1007, unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
- D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section.
- E. Cut framing members by sawing or shearing; do not torch cut.
- F. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.

- G. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- H. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
- I. Install framing members in one-piece lengths, unless splice connections are indicated for track or tension members.
- J. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- K. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- L. Install insulation in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- M. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- N. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch. and as follows:
- O. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 TRUSS INSTALLATION

- A. Install, bridge, and brace trusses according to Shop Drawings and requirements in this Section.
 - 1. Truss Spacing: As indicated.
 - 2. Do not alter, cut, or remove framing members or connections of trusses.
 - 3. Erect trusses with plane of truss webs plumb and parallel to each other, align, and accurately position at spacings indicated.
 - 4. Erect trusses without damaging framing members or connections.
 - 5. Install continuous bridging and permanently brace trusses as indicated on Drawings.

3.5 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing agency to perform field quality-control testing.
 - 1. Field and shop welds will be subject to inspection and testing.
 - 2. Testing agency will report test results promptly and in writing to Contractor and Architect.
 - 3. Remove and replace Work that does not comply with specified requirements.
 - 4. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.

END OF SECTION

SECTION 05500 - MISCELLANEOUS STEEL AND METAL FABRICATIONS

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 work of this section.

1.2 DESCRIPTION OF WORK

- A. Definition: Metal fabrications include items made from iron and steel shapes, plates bars, strips, tubes, pipes and castings which are not a part of structural steel or other metal systems specified elsewhere.
- B. Extent of metal fabrications is indicated on drawings and schedules.
- C. Types of work in this section include metal fabrications for:
 - 1. Rough hardware.
 - 2. Nosing.
 - 3. Loose bearing and leveling plates.
 - 4. Loose steel lintels.
 - 5. Miscellaneous framing and supports.
 - 6. Miscellaneous steel trim.
 - 7. Shelf angles.

1.3 QUALITY ASSURANCE

- A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, anchor details and installation instructions for products used in miscellaneous metal fabrications, including paint products and grout.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of metal fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.
 - 1. Where materials or fabrications are indicated to comply with certain requirements for design loadings, include structural computations, material properties and other information needed for structural analysis.
- C. Samples: Submit 2 sets of representative samples of materials and finished products as may be requested by Architect.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. FERROUS METALS
 - 1. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
 - 2. Steel Structural, Shapes and Bars: ASTM A 36, wide flange, ASTM A572, fy=50ksi.
 - 3. Steel Tubing: Hot-rolled, ASTM A 500. FY=46KSI

4. Structural Steel Sheet: Hot-rolled, ASTM A 570; or cold-rolled ASTM A 611, Class 1; of grade required for design loading.
5. Galvanized Structural Steel Sheet: ASTM A 446, of grade required for design loading. Coating designation as indicated, or if not indicated, G90.
6. Steel Pipe: ASTM A 53; Type and grade (if applicable) as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (schedule 40), unless otherwise indicated.
7. Gray Iron Castings: ASTM A 48, Class 30.
8. Malleable Iron Castings: ASTM A 47, grade as selected by fabricator.
9. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
10. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.
11. Non-Shrink Non-Metallic Grout: Pre-mixed, factory-packaged, non- staining, non-corrosive, non-gaseous grout complying with CE CRD-C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.

B. FASTENERS

1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
2. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
3. Lag Bolts: Square head type, FS FF-B-561.
4. Machine Screws: Cadmium plated steel, FS FF-S-92.
5. Wood Screws: Flat head carbon steel, FS FF-S-111.
6. Plain Washers: Round, carbon steel, FS FF-W-92.
7. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
8. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.
9. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

C. PAINT:

1. Shop Primer for Ferrous Metal: Manufacturer's or Fabricator's standard, fast-curing, lead-free, "universal" primer; selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements of FS TT-P-645.
2. Galvanizing Repair Paint: High zinc dust content paint for regalvanizing welds in galvanized steel, complying with the Military Specifications MIL-P-21035 (Ships) or SSPC-Paint-20.

D. CONCRETE FILL:

1. Concrete Materials and Properties: Comply with requirements of Division-3 section "Concrete Work" for normal weight, ready-mix concrete with minimum 28-day compressive strength of 3000 psi, and W/C ratio of 0.58 maximum, unless higher strengths indicated.
2. Non-Slip Aggregate Finish: Factory-graded, packaged material containing fused aluminum oxide grits or crushed emery as abrasive aggregate; rust-proof and non-glazing; unaffected by freezing, moisture or cleaning materials.

2.2 FABRICATION - GENERAL

- A. Workmanship: Use materials of size and thickness indicated, or if not indicated, as required to produce strength and durability in finished product for use intended. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of work.
- B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- C. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts.
- E. Provide for anchorage of type indicated, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
- F. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
- G. Galvanizing: Provide a zinc coating for those items indicated or specified to be galvanized, as follows:
 - 1. ASTM A153 for galvanizing iron and steel hardware.
 - 2. ASTM A 123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier.
 - 3. ASTM A386 for galvanizing assembled steel products.
- H. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
- I. Shop Painting:
 - 1. Apply shop primer to surfaces of metal fabrications except those which are galvanized or as indicated to be embedded in concrete or masonry, unless otherwise indicated, and in compliance with requirements of SSPC-PA1 "Paint Application Specification No. 1" for shop painting.
 - a. Stripe paint all edges, corners, crevices, bolts, welds and sharp edges.
- J. Surface Preparation: Prepare ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
 - 1. Exteriors (SSPC Zone 1B): SSPC-SP6 "Commercial Blast cleaning".
 - 2. Interior (SSPC Zone 1A): SSPC-SP3 "Power Tool Cleaning".

2.3 ROUGH HARDWARE

- A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division-6 sections.
- B. Fabricate items to sizes, shapes and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

2.4 LOOSE STEEL LINTELS

- A. Provide loose structural steel lintels for openings and recesses in masonry walls and partitions as shown and scheduled. Weld adjoining members together to form a single unit where indicated.

Provide not less than 8" bearing at each side of openings, unless otherwise indicated. All steel lintels shall be hot-dipped galvanized steel.

2.5 MISCELLANEOUS FRAMING AND SUPPORTS

- A. Provide miscellaneous steel framing and supports which are not a part of structural steel framework, as required to complete work.
- B. Fabricate miscellaneous units to sizes, shapes and profiles indicated or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise indicated, fabricate from structural steel shapes, plates and steel bars of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.
- C. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.
 - 1. Except as otherwise indicated, space anchors 24" o.c. and provide minimum anchor units of 1-1/4" x 1/4" x 8" steel straps.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.
- B. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

3.2 INSTALLATION - GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
- B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plus, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete masonry or similar construction.
 - 1. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.
- C. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.
- D. Setting Loose Plates: Clean concrete and masonry bearing surfaces of any bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.
 - 1. Set loose leveling and bearing plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut-off flush with the edge of the bearing plate before packing with grout. Use metallic non-shrink grout in concealed locations where not

exposed to moisture; use non-metallic non-shrink grout in exposed locations, unless otherwise indicated.

3.3 ADJUST AND CLEAN

- A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting.
- B. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- C. For galvanized surfaces: Clean field welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 05515 - LADDERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Aluminum Access Ladders.

1.2 RELATED SECTIONS

- A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.
- B. Section 05500 – Metal Fabrications: Fasteners and installation requirements used to attach ladders to structure.

1.3 REFERENCES

- A. AA – Aluminum Association.
- B. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- C. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- D. OSHA 1910.27 – Fixed Ladders.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01320 or 01330.
- B. Product Data: Manufacturer's data sheets on each product.
- C. Shop Drawings:
 - 1. Detail fabrication and erection of each ladder indicated. Include plans, elevations, sections, and details of metal fabrications and their connections.
 - 2. Provide templates for anchors and bolts specified for installation under other Sections.
 - 3. Provide reaction loads for each hanger and bracket.
- D. Qualification Data:
 - 1. Refer to Quality Assurance provisions for submittal requirements evidencing experience, certifications and resources.
- E. Selection Samples: For each finish specified, two complete sets of color chips representing manufacturer's full range of available colors.
- F. Verification Samples: For each finish specified, two samples, minimum size 6 inches (150 mm) square, represent actual product color.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in producing aluminum metal ladders similar to those indicated for this Project.
 - 1. Record of successful in-service performance.
 - 2. Sufficient production capacity to produce required units.
 - 3. Professional engineering competent in design and structural analysis to fabricate ladders in compliance with industry standards and local codes.
- B. Installer Qualifications: Competent and experienced firm capable of selecting fasteners and installing ladders to attain designed operational and structural performance.
- C. Product Qualification: Product design shall comply with OSHA 1910.27 minimum standards for ladders.

- D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Install ladder in area designated by Architect.
2. Do not proceed with remaining work until workmanship and installation are approved by Architect.
3. Rework mock-up as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions by field measurement before fabrication.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, indicate established dimensions on shop drawing submittal and proceed with fabrication.

1.8 WARRANTY

- A. Manufacturer has responsibility for an extended Corrective Period for work of this Section for a period of 5 years commencing on the shipment date of the product against all the conditions indicated below, and when notified in writing from Owner, manufacturer shall promptly and without inconvenience and cost to Owner correct said deficiencies.
1. Defects in materials and workmanship.
 2. Deterioration of material and surface performance below minimum OSHA standards as certified by independent third party testing laboratory. Ordinary wear and tear, unusual abuse or neglect excepted.
 3. Within the warranty period, the manufacturer shall repair, replace, or refund the purchase price of defective ladder.

1.9 EXTRA MATERIALS

- A. Furnish touchup kit for each type and color of paint finish provided.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
1. O'Keeffe's, Inc.; 100 N Hill Drive, Suite 12, Brisbane, CA 94005. Toll Free Tel: (888) 653-3333. Tel: (415) 824-4900. Fax: (415) 824-5900. Email: info@okeeffes.com. Web: <http://www.okeeffes.com>.
 2. Equal products of other manufacturers may be used in the work, provided such products have been approved by the architect no later than Ten (10) days prior to bid opening.
 3. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 APPLICATIONS/SCOPE

- A. Fixed and Cage Ladder Design:
1. Safety cages are required on ladders over 20 feet (6096 mm)
 2. Safety cages are required on all ladders in high or hazardous areas.
 3. Landing platforms are required at 30 feet (9144 mm) above the bottom of the ladder.

B. Fixed Access Ladder:

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1. Tubular Rail Low Parapet Access Ladder with Roofover Rail Extension.

a. Model 502 as manufactured by O’Keeffe’s Inc.

b. Finish: Mill finish. As extruded.

c. Location: Roof

C. Cage Ladder:

1. Cage Ladder with Roofover Rail Extension.

a. Model 532 as manufactured by O’Keeffe’s Inc.

b. Finish: Mill finish. As extruded.

c. Location: Roof

2. Cage Ladder with High Parapet Access, Platform and No Return.

a. Model 533A as manufactured by O’Keeffe’s Inc.

b. Location: Roof

2.3 FINISHES

A. Mill finish. As extruded.

B. Clear Anodic Finish: AA-M10C22A41 Mechanical finish as fabricated. Architectural Class I, clear coating 0.018 mm or thicker.

C. Paint. Urethane over chemically pretreated substrate.

1. Fire Red (RAL 2002).

2. Alert Orange (RAL 2003).

3. Warning Blue (RAL 5005).

4. Caution Yellow (RAL 1018).

5. Safety Green (RAL 6001).

6. As scheduled on drawings.

2.4 MATERIALS

A. Aluminum Sheet: Alloy 5005-H34 to comply with ASTM B209.

B. Aluminum Extrusions: Alloy 6063-T6 to comply with ASTM B221.

2.5 FABRICATION

A. Rungs: Not less than 1-1/4 inches (32 mm) in section and 18-3/8 inches (467mm) long, formed from tubular aluminum extrusions. Squared and deeply serrated on all sides.

1. Rungs shall withstand a 1,500 pound (454 kg) load without deformation or failure.

B. Channel Side Rails: Not less than 1/8 inch (3 mm) wall thickness by 3 inches (76 mm) wide.

C. Heavy Duty Tubular Side Rails: Assembled from two interlocking aluminum extrusions no less than 1/8 inch (3 mm) wall thickness by 3 inches (76 mm) wide. Construction shall be self-locking stainless steel fasteners, full penetration TIG welds and clean, smooth and burr-free surfaces.

D. Ship Ladders: Not less than 1-1/4 inches (32mm) high, 4-1/8 inch (105 mm) deep and 2 feet (610 mm) wide; tread spacing shall be 1 foot (305 mm) on center. Handrails shall be aluminum pipe, not less than 1-1/2 inches (38 mm) in diameter with hemispheric end caps.

E. Walk-Through Rail and Roof Rail Extension: Not less than 3 feet 6 inches (1067 mm) above the landing and shall be fitted with deeply serrated, square, tubular grab rails.

F. Landing Platform: 1-1/2 inches (38 mm) or greater diameter, tubular aluminum guardrails and decks of serrated aluminum treads.

- G. Security Doors: Formed 1/8 inch (3 mm) thick aluminum sheet. Security panels shall extend on both sides, perpendicular to the door face, to within 2 inches (51 mm) of the wall. Security door shall be furnished with continuous aluminum piano hinge and heavy duty forged steel locking hasps.
- H. Safety Cages:
 - 1. Fabricate ladder safety cages to comply with authority having jurisdiction. Assemble by welding. Spacing of primary hoops, secondary hoops and vertical bars shall not exceed that required by code.
 - 2. Safety cage hoops and vertical bars: 3/16 inch (5 mm) by 2 inches (51 mm) aluminum bar.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Coordinate anchorages. Furnish setting drawings, templates, and anchorage structural loads for fastener resistance.
- B. Do not begin installation until supporting structure is complete and ladder installation will not interfere with supporting structure work.
- C. If supporting structure is the responsibility of another installer, notify Architect of unsatisfactory supporting work before proceeding.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction.

3.3 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 05540 - METAL STUDS

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 work of this section.

1.2 DESCRIPTION OF WORK

- A. Types of work include:
 - 1. Light-gage metal support system for installation of gypsum and other materials.

1.3 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Where gypsum drywall systems with fire- resistance ratings are indicated, provide materials and installations which are identical with those of applicable assemblies tested per ASTM E 119 by fire testing laboratories acceptable to authorities having jurisdiction.
 - 1. Provide fire-resistance rated assemblies identical to those indicated by reference to GA File No.'s. in GA "Fire Resistance Design Manual" or to design designations in UL "Fire Resistance Directory" or in listing of other testing and agencies acceptable to authorities having jurisdiction.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications and installation instructions, including other data as may be required to show compliance with these specifications.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store material inside under cover and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Alabama Metal Industries Corp.
 - 2. Bostick Steel Framing Co.
 - 3. Ceco Corp.
 - 4. Dale Industries, Inc.
 - 5. Marinoware, Inc.
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect not less than Ten (10) days prior to scheduled bid opening.

2.2 METAL FRAMING

- A. Fabrication: Fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi; ASTM A446, A570 or A611.
- B. Finish: Provide galvanized finish to metal framing components complying with ASTM A525 for minimum G60 coating.

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- C. "C"-Shape Studs and Resilient Channels. Provide as follows:
 - 1. Manufacturer's standard 22 gauge at all interior gypsum board locations, size to be as noted on the drawings.
 - 2. Gauge at all exterior locations to be 18 gauge at exterior walls or as noted on the Structural Drawings, size to be as noted on the drawings.
 - 3. Resilient hat channels, 18 gauge, size as noted on the drawings.
- D. "C"H-Shape Studs: Provide manufacturer's standard 20 gauge unless otherwise noted on the Structural Drawings, size to be as noted on the drawings.
- E. Fastenings: Attach components by welding, bolting, or screw fastenings, as standard with manufacturers.

2.3 INSTALLATION

- A. Manufacturer's Instructions: Install metal framing systems in accordance with manufacturer's printed or written instructions and recommendations, unless otherwise indicated.
- B. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Secure tracks as recommended by stud manufacturer for type of construction involved, except do not exceed 24" o.c. spacing for nail or power-driven fasteners, or 16" o.c. for other types of attachment. Provide fasteners at corners and ends of tracks.
 - 1. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
 - 2. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure.
 - 3. Install supplementary framing, blocking and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.
- C. Installation of Wall Stud System: Secure studs to top and bottom runner tracks by either welding or screw fastening at both inside and outside flanges.
 - 1. Frame wall openings larger than 2'-0" square with double stud at each jamb of frame except where more than 2 are either shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall. Secure stud system wall opening frame in manner indicated.
 - 2. Frame both sides of expansion and control joints, with separate studs; do not bridge the joint with components of stud system.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Space framing member 24" o.c., unless noted otherwise on the drawings or by UL Classification.
- B. Install auxiliary framing at termination of drywall work, and at openings for light fixtures and similar work, as required for support of both the drywall construction and other work indicated for support thereon.
- C. Supplementary Supports:
 - 1. Install supplementary framing, blocking and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings,

and similar work to comply with details indicated or if not otherwise indicated, to comply with applicable published recommendations of gypsum board manufacturer, or if not available, of "Gypsum Construction Handbook" published by United States Gypsum Co.

2. Isolate stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.
3. Extend supplementary supports to the structural support system.
4. Frame openings to comply with details indicated or if not otherwise indicated, to comply with applicable published recommendations of gypsum board manufacturer, or if not available, of "Gypsum Construction Handbook" published by United States Gypsum Co. Attach vertical studs at jambs directly to frames; install runner track section (for jack studs) at head and secure to jamb studs.
5. Erect thermal insulation vertically. Until gypsum board is installed hold insulation in place with 18-gage tie wire or by an equally acceptable method.

END OF SECTION

SECTION 06100 - 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 work of this section.

1.2 SCOPE OF WORK

- A. Provide the wood products necessary to complete the roofing work in accordance with the specifications and drawings.
- B. Related work specified elsewhere:
 - 1. Division 7 Section "Membrane Roofing"
 - 2. Division 7 Section "Sheet Metal Flashing And Trim."

1.3 REFERENCES

- A. ASTM D – 1079 Terminology Relating to Roofing, Waterproofing, and Bituminous Materials
- B. Lumber Standards: American Softwood Lumber Standard PS 20-70 by the U.S. Department of Commerce.
- C. ASTM E – 108 Test Methods for Fire Test of Roof Coverings
- D. FM - Factory Mutual
- E. NRCA - National Roofing Contractors Association
- F. UL- Underwriters Laboratories
- G. WH - Warnock Hersey

1.4 SUBMITTALS

- A. Provide submittals for lumber or plywood materials upon request.

1.5 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Use experienced installers.
- B. Lumber Standards: Comply with American Softwood Lumber Standard PS 20-70 by the U.S. Department of Commerce.
- C. Factory Marking: Mark each piece of lumber or plywood to indicate type, grade, agency providing inspection service.
- D. Size and Shape: Dress lumber 4 sides (S4S) and work to shapes and patterns shown. Nominal sizes shown and specified refer to undressed lumber dimensions. Detailed dimensions show actual lumber size required.

1.6 DELIVERY STORAGE AND HANDLING

- A. Time delivery and installation of carpentry work to avoid delaying other trades whose work is dependent on or affected by the carpentry work. Keep materials dry during delivery and storage
- B. Store lumber and plywood in stacks with provisions for air circulation within stacks. Protect bottom of stacks against contact with damp or wet surfaces.
- C. Protect exposed materials against water and wind. Remove damaged or unsuitable material from the job site.

PART 2 - PRODUCTS

2.1 GENERAL

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- A. Provide nailers, wood blocking and plywood as necessary to complete roofing work as directed by governing codes, roof manufacturer, and this specification.

2.2 DESCRIPTION

- A. Construction Lumber: Treated Standard Grade Douglas Fir, Western Larch, Western Hemlock (WWPA or WCLB) or No. 2 dimension Southern Pine (SPIB).
- B. Bucks, Nailers, Blocking, Etc.: Treated No. 2 common grade of any WWPA or WCLA species or No. 2 Southern Pine(SPIB).
- C. Anchorage and Fastenings: Proper type, size material and finish for each application.
- D. Quality: Sound, seasoned, well manufactured materials of longest practical lengths and sizes to minimize joints. Free from warp which cannot be easily corrected by anchoring and attachment. Discard material with defects which would impair quality of work.

2.3 RELATED MATERIALS

- A. Fasteners: Use fasteners as dictated by Factory Mutual Wind Uplift requirements of Data Loss Sheet 1-49.
- B. Roof Membranes: Follow provisions in Section for Membrane Roofing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify measurements and dimensions shown before proceeding with carpentry work.
- B. Examine supporting structure and conditions under which carpentry work is to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.
- C. Correlate location of nailers, blocking and similar supports for attached work.
- D. Scribe and cope as required for accurate fit of carpentry work to other work.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Provide nailers, blocking and sleepers where shown on the drawings and details, or required for attachment of other work. Coordinate with locations of other work involved; refer to shop specifications of such work.
- B. Attach to substrate securely as required to support applied loading. Countersink bolts and nuts flush with surfaces.
- C. Securely attach wood nailers to substrates in accordance with Factory Mutual Loss Prevention Data Sheet 1-49 and as required by recognized standards.
- D. Provide washers under bolt heads and nuts in contact with wood.
- E. Do not wax or lubricate fasteners that depend on friction for holding power.
- F. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish material. Make tight connections between members. Install fasteners without splitting of wood; predrill as required. Do not drive threaded friction type fasteners; turn into place. Tighten bolts and lag screws at installation and retighten as required for tight connections prior to closing in or at completion of work.

END OF SECTION

SECTION 06241 - SOLID SURFACING FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide solid surfacing fabrications including but not limited to following:
 - 1. Surface Tops
- B. Related Sections: Following description of work is included for reference only and shall not be presumed complete:
 - 1. Finish Carpentry - Section 06100.
 - 2. Joint Sealants - Section 07900.

1.2 REFERENCES

- A. Definitions:
 - 1. Solid Surface: Non-porous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meetings: Arrange preinstallation meeting 1 week prior to commencing work with all parties associated with trade as designated in Contract Documents or as requested by Architect. Presided over by Contractor, include Architect who may attend, Subcontractor performing work of this trade, Owner's representative, testing company's representative and consultants of applicable discipline. Review Contract Documents for work included under this trade and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, Project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of work of this Section.

1.4 SUBMITTALS

- A. Product Data: Indicate Product description including solid surface sheets, sinks, bowls and illustrating full range of standard colors, fabrication information and compliance with specified performance requirements. Submit Product data with resistance to list of chemicals.
- B. Shop Drawings: Submit Shop Drawings for work of this Section in accordance with section 01600. Indicate plans, sections, dimensions, component sizes, edge details, thermosetting requirements, fabrication details, attachment provisions, sizes of furring, blocking, including concealed blocking and coordination requirements with adjacent work. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacles and other items installed in solid surface.
- C. Coordination Drawings: Submit coordination drawings indicating plumbing and miscellaneous steel work indicating locations of wall rated or non-rated, blocking requirements, locations and recessed wall items and similar items.
- D. Samples: Submit samples in accordance with Section 01 30 00. Submit minimum 6" x 6" samples.
 - 1. Cut sample and seam together for representation of inconspicuous seam. Indicate full range of color and pattern variation. Approved samples will be retained as standards for work.
- E. Test and Evaluation Reports: Submit flammability test reports and food preparation zone certifications/listing confirming compliance with NSF/ANSI 51. Refer to www.nsf.org for the latest compliance to NSF/ANSI 51 for Food Zone — all food types.

1.5 CLOSEOUT SUBMITTALS

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A. Operational and Maintenance Data:

1. Submit manufacturer's care and maintenance data, including repair and cleaning instructions. Include in Project closeout documents.
2. Provide a commercial care and maintenance kit and video. Review maintenance procedures and warranty details with Owner upon completion.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Installers: Provide work of this Section executed by competent installers with minimum 5 years of experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

B. Mock-Ups:

1. Prior to final approval of Shop Drawings, erect 1 full size mock-up of each component at Project site demonstrating quality of materials and execution for Architect review.
2. Should mock-up not be approved, rework or remake until approval is secured. Remove rejected units from Project site.
3. Approved mock-up will be used as standard for acceptance of subsequent work.
4. Approved mock-ups may remain as part of finished work.

1.7 DELIVERY, STORAGE AND HANDLING

A. Delivery and Acceptance Requirements: Deliver no components to Project site until areas are ready for installation.

B. Storage and Handling Requirements:

1. Store components indoors prior to installation.
2. Handle materials to prevent damage to finished surfaces.

1.8 WARRANTY

A. Manufacturer Warranty: Provide manufacturer's standard warranty for material only for period of 10 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Architect and at no expense to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer Products of following manufacturers are acceptable subject to Conformance to requirements of Drawings, Schedules and Specifications:

1. Corian® by DuPont; www.corian.com
2. Wilsonart Contract; www.wilsonartcontract.com
3. Formica; www.formica.com

B. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS

A. Performance/Design Criteria:

<u>Property</u>	<u>Requirement</u>	<u>Test Procedure</u>
(min or max)		

1. Solid Surface Based Products:

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a. Tensile Strength	6000 psi min	ASTM D638
b. Tensile Modulus	1.5 x 10 ⁶ psi min	ASTM D638
c. Tensile Elongation	0.4% min.	ASTM D638
d. Flexural Strength	10000 psi min	ASTM D790
e. Flexural Modulus	1.2 x 10 ⁶ psi min	ASTM D790
f. Hardness	>85-Rockwell "M" scale min.	ASTM D785
g. Thermal Expansion	2.2 x 10 ⁻⁵ in./in./°F	ASTM E228
h. Fungi and Bacteria	Does not support microbial growth	ASTM G21 & G22
i. Microbial Resistance	Highly resistant to mold growth	UL 2824
j. Ball Impact	No fracture - 1/2 lb. Ball: 6 mm slab - 36" drop 12 mm slab - 144" drop	NEMA LD 3, Method 3.8
k. Weatherability	ΔE*94<5 in 1,000 hrs	ASTM G155
l. Flammability		ASTM E84, NFPA 255 & UL 723

All Colors

	6 mm	12 mm	
m. Flame Spread	<25	<25	
n. Smoke Developed	<25	<25	
o. Class	A	A	NFPA 101®, Life Safety Code

- B. Solid Surface Material: Single Source manufacturer for all solid surfacing fabrications on entire project.
- C. Non-porous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment; not coated, laminated or of composite construction; meeting following criteria:
- D. Flammability: Class 1 and A when tested to UL 723.
- E. Food Equipment Material Compliance: Food Zone to NSF/ANSI 51.
 - 1. Ensure material has minimum physical and performance properties specified under "Performance/Design Criteria".
 - 2. Ensure superficial damage to a depth of 0.010" is repairable by sanding and polishing.
- F. Adhesive for Bonding to Other Products: One component silicone to ASTM C920.
- G. Sealant: A standard mildew-resistant, FDA/UL® [and NSF/ANSI 51 compliant in Food Zone area,] recognized silicone color matched sealant or clear silicone sealants.
- H. Sink/Bowl Mounting Hardware: Manufacturer's approved bowl clips, brass inserts and fasteners for attachment of undermount sinks/bowls.
- I. Heat Reflecting Tape: Manufacturer's standard aluminum foil tape, with required thickness, for use with cutouts near heat sources.
- J. Insulating Nomex® Fabric: Manufacturer's standard for use with conductive tape in insulating solid surface material from adjacent heat source.

2.3 COMPONENTS

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- A. Counter Perimeter Frame: Ensure 3/4" thick, moisture resistant cores for counter tops in wet areas having sinks or lavatories are 3/4" thick exterior grade plywood with waterproof adhesive. Ensure fire retardant Product contains fire-retardant chemicals injected with raw materials during manufacturing and achieves a maximum flame-spread rating of 25 with a maximum smoke development of 200 when tested to ASTM E84.
- B. Surface Tops: 3/4" thick countertop of solid polymer solid surfacing material, cast to desired profiles and sizes having edge details as indicated on Drawings or from manufactures standards, conforming to CSA B45.5/IAPMO Z124, as specified.
- C. Provide countertops complete with backsplashes and endsplashes of size shown on Drawings. Minimum 4" side and back splashes required at all countertops if not otherwise indicated on drawings. All cutouts required in tops should be coordinated with those trades relevant to necessary cutouts.
- D. Fabrication:
 - 1. Fabricate components in shop to greatest extent practical to sizes and shapes indicated, in accordance with approved Shop Drawings and solid polymer manufacturer requirements. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints. Provide factory cutouts for plumbing fittings and bath accessories as indicated on Drawings.
 - 2. Where indicated, thermoform corners and edges or other objects to shapes and sizes indicated on Drawings, prior to seaming and joining. Cut components larger than finished dimensions and sand edges to remove nicks and scratches. Heat entire component uniformly prior to forming.
 - 3. Ensure no blistering, whitening and cracking of components during forming.
 - 4. Fabricate backsplashes from solid surfacing material with optional radius cove where counter and backsplashes meet as indicated on Drawings. Backsplashes for most colors may be fabricated by traditional means discussed in K-25294 Backsplashes. Colors with metallic/mica particle or veined colors creating directional aesthetics (K-26833 Directional Aesthetics) may require the techniques in Technical Bulletin K-28235 Thermoformed Backsplash.
 - 5. Fabricate joints between components using manufacturer's standard joint adhesive. Ensure joints are inconspicuous in appearance and without voids. Attach 50 mm (2") wide reinforcing strip of solid polymer material under each joint. Reinforcing strip of solid polymer material is not required when using DuPont™ Joint Adhesive 2.0.
 - 6. Provide holes and cutouts for plumbing and bath accessories as indicated on Drawings.
 - 7. Rout and finish component edges to a smooth, uniform finish. Rout cutouts, then sand edges smooth. Repair or reject defective or inaccurate work.
 - 8. Finish: Ensure surfaces have uniform finish: As selected by Architect.
 - a. Matte, with a 60° gloss rating of 5 - 20.
 - b. Semi-gloss, with a 60° gloss rating of 25 - 50.
 - c. Polished, with a 60° gloss rating of 55 - 80.
 - 9. Fabrication Tolerances:
 - a. Variation in Component Size: +/-1/8".
 - b. Location of Openings: +/-1/8" from indicated location.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:

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SOLID SURFACE FABRICATIONS
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1. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work. Proceed with installation only after unsatisfactory conditions have been corrected.
 2. Verify actual site dimensions and location of adjacent materials prior to commencing work.
 3. Examine cabinets upon which counter tops are to be installed. Verify cabinets are level to within 1/8" in 10' - 0".
 4. Notify Architect in writing of any conditions which would be detrimental to installation.
- B. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2 INSTALLATION

- A. Install components plumb, level, rigid, scribed to adjacent finishes in accordance with reviewed Shop Drawings and Product installation details.
- B. Fabricate field joints using manufacturer's recommended adhesive, with joints being inconspicuous in finished work. Exposed joints/seams are not permitted. Keep components and hands clean when making joints. Reinforce field joints as specified herein. Cut and finish component edges with clean, sharp returns.
- C. Route radii and contours to template. Anchor securely to base component or other supports. Align adjacent components and form seams to comply with manufacturer's written recommendations using adhesive in color to match work. Carefully dress joints smooth, remove surface scratches and clean entire surface.
- D. Install countertops with no more than 1/8" sag, bow or other variation from a straight line.
- E. Adhere undermount/submount/bevel mount sinks/bowls to countertops using manufacturer's recommended adhesive and mounting hardware.
- F. Adhere topmount sinks/bowls to countertops using manufacturer recommended adhesives and color-coordinated silicone sealant. Secure seam mount bowls and sinks to counter tops using color matched joint adhesive.
- G. Seal between wall and components with joint sealant as specified herein and in Section 0790, as applicable.
- H. Provide backsplashes and endsplashes as indicated on Drawings. Adhere to countertops using a standard color-coordinated silicone sealant. Adhere applied sidesplashes to countertops using a standard color-matched silicone sealant. Provide coved backsplashes and sidesplashes at walls and adjacent millwork. Fabricate radius cove at intersection of counters with backsplashes to dimensions shown on reviewed Shop Drawings. Adhere to countertops using manufacturer's standard color-coordinated joint adhesive.
- I. Keep components and hands clean during installation. Remove adhesives, sealants and other stains. Ensure components are clean on date of Substantial Completion of the Work.
- J. Coordinate connections of plumbing fixtures and make plumbing connections to sinks in accordance with Division 15 Mechanical and with any other division requiring cutouts.
- K. Provide holes and cutouts indicated on approved shop drawings. Rout cutouts and complete by sanding all edges smooth.

3.3 REPAIR

- A. Repair minor imperfections and cracked seams and replace areas of severely damaged surfaces in accordance with manufacturer's "Technical Bulletins".

3.4 SITE QUALITY CONTROL

- A. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Architect at no cost to Owner.

3.5 CLEANING

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- A. Remove excess adhesive and sealant from visible surfaces.
- B. Clean surfaces in accordance with manufacturer's "Care and Maintenance Instructions".

3.6 PROTECTION

- A. Provide protective coverings to prevent physical damage or staining following installation for duration of Project.
- B. Protect surfaces from damage until date of Substantial Completion of the Work.

END OF SECTION

SECTION 07115 - BITUMINOUS DAMPPROOFING

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 work of this section.

1.2 SUMMARY

- A. This Section includes cold-applied, emulsified-asphalt dampproofing applied to the following surfaces:
 - 1. Exterior face of inner wythe of exterior masonry cavity walls and concrete walls above top of foundation.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include recommendations for method of application, primer, number of coats, coverage or thickness, and protection course.
- B. Material Certificates: For each product, signed by manufacturers.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain primary dampproofing materials and primers through one source from a single manufacturer. Provide secondary materials recommended by manufacturer of primary materials.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt dampproofing to be performed according to manufacturers' written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cold-Applied, Emulsified-Asphalt Dampproofing:
 - 2. Euclid Chemical Company (The)
 - 3. Gardner Asphalt Corporation
 - 4. Henry Corporation
 - 5. Koppers Industries, Inc.
 - 6. Malarkey Roofing Company
 - 7. Meadows, W. R., Inc.
 - 8. Sonneborn, Div. Of ChemRex, Inc.
 - 9. Tamms Industries

2.2 BITUMINOUS DAMPPROOFING

- A. Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class I.

2.3 MISCELLANEOUS MATERIALS

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- A. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class I, except diluted with water as recommended by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Applicator present, for compliance with requirements for surface smoothness and other conditions affecting performance of work.
 - 1. Begin dampproofing application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protection of Other Work: Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.
- B. Clean substrates of projections and substances detrimental to work; fill voids, seal joints, and apply bond breakers if any, as recommended by prime material manufacturer.

3.3 APPLICATION, GENERAL

- A. Comply with manufacturers written recommendations unless more stringent requirements are indicated or required by Project conditions to ensure satisfactory performance of dampproofing.
- B. Apply additional coats if recommended by manufacturer or required to achieve coverage's indicated.
- C. Allow each coat of dampproofing to cure 24 hours before applying subsequent Coats.
- D. Apply dampproofing to top of footings and grade beams where applicable, whether indicated or not.
 - 1. Apply from finished-grade line to top of footing.
 - 2. Extend 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
 - 3. Install flashings and corner protection stripping at internal and external corners, changes in plan, construction joints, cracks, and where shown as "reinforced," by embedding an 8-inch (200 mm) wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat required for embedding fabric is in addition to other coats required.
- E. Apply dampproofing to provide continuous plane of protection on exterior face of inner wythe of exterior masonry cavity walls.
 - 1. Lap dampproofing at least ¼ inch (6 mm) onto flashing, masonry reinforcement, veneer ties, and other items that penetrate inner wythe.
 - 2. Extend dampproofing over outer face of structural members and concrete slabs that interrupt inner wythe, and lap dampproofing at least ¼ inch (6 mm) onto shelf angles supporting veneer.

3.4 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. On Exterior Face of Inner Wythe of Cavity Walls: Apply primer and one brush or spray coat at not less than 1 gal./100 sq. ft. (0.4 L/sq.m).

3.5 CLEANING

- A. Remove dampproofing materials from surfaces not intended to receive dampproofing.

END OF SECTION

SECTION 07200 - 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 shall apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. Extent of insulation work is shown on drawings and indicated by provisions of this section.
- B. Applications of insulation specified in this section include the following:
 - 1. Sound Attenuation at exterior stud walls.
 - 2. Sound Attenuation above acoustical ceilings – at partition walls.
 - 3. Cavity Wall Insulation.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications and installation instructions for each type of insulation and vapor barrier material required.

1.4 PRODUCT HANDLING

- A. General Protection: Protect insulations from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

PART 2 - PRODUCTS

2.1 BATT INSULATION

A. MANUFACTURERS:

- 1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
 - a. Certain-Teed Products Corp.; Valley Forge, PA
 - b. Manville Bldg. Materials Corp.; Denver, CO.
 - c. Owens-Corning Fiberglass Corp.; Toledo, OH.
- 2. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

B. MATERIALS:

- 1. Mineral/Glass Fiber Blanket/Batt Insulation (M/GFB-Ins): Inorganic (nonasbestos) fibers formed into resilient flexible blankets or semi-rigid batts; FS HH-1-521. Manufacturer's standard lengths and widths as required to coordinate with spaces to be insulated.
- 2. Exterior Walls: Provide foil faced (FSK ASTM 84 – non-flammable) batts at all exterior walls that will have no interior wall covering applied.
 - a. Thickness: 3 ½" Batts will have a minimum R13
 - b. Thickness: 6" Batts will have a minimum R19
- 3. Above Ceilings: Provide unfaced batts at exposed wood framed roof areas between the trusses at the bottom cord or joists that will receive interior coverings at the bottom of the system (ie: sheetrock, plywood, concrete, etc.).
 - a. Thickness: R-Factor: 38 (minimum)

4. Above New Acoustical Ceilings: Provide unfaced Sound Attenuation batts above all interior metal stud partition-divider walls as indicated on drawings.
 - a. Thickness: 3 ½" (nominal), Unfaced batts laid over acoustical ceiling.
 - b. Install 4'-0" out from each side of partition/divider wall.
 - c. Install entire length of partition/divider wall.

2.2 CAVITY WALL INSULATION - POLYISOCYANURATE

A. MANUFACTURERS:

1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
 - a. Sika Corporation - Rmax; 13524 Welch Road, Dallax, TX 75244; Ph.: 800.527.0890: www.rmax.com.
 - b. Carlisle.
 - c. Johns Manville, Inc.
2. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

B. MATERIALS:

1. Rigid Foam Insulation Board: Aluminum-Faced, Polyisocyanurate-Foam Insulating Sheathing: ASTM C1289, Type I, Class 1 or Class 2, rigid, cellular, polyisocyanurate thermal insulation, bonded to reinforced aluminum facers on both sides.
 - a. Basis of Design: Thermasheath from Rmax.
 - b. Flame Spread Index and Smoke Contribution per ASTM E84:
 - i. Flame: 25 or less at thickness of 1 inch (25 mm) or greater; and 75 or less at thickness of less than 1 inch (25 mm).
 - ii. Smoke: 450 or less.
 - c. Water Vapor Permeability per ASTM E96 desiccant method: 0.03 perm or less.
 - d. Air Permeability per ASTM E2178: 0.004 cfm per sq ft (1.2192 L per min per sq m) or less.
 - e. Compressive Strength per ASTM D1621:
 - i. 20 psi (138 kPa).
 - ii. 25 psi (172 kPa).
 - f. R-Value per ASTM C518: R-6.0 minimum at thickness of 1 inch (25 mm) and R-13.1 minimum at thickness of 2 inches (51 mm).
 - g. Required Insulation Thickness and R-value: As indicated on the Drawings.
 - h. Insulation shall be suitable as continuous exterior wall insulation.
 - i. Exterior Usage in NFPA 285 Wall Assemblies:
 - j. Acceptable for inclusion in NFPA 285 exterior wall assemblies that include exterior gypsum sheathing.
2. All Cavity Walls: Provide rigid thermal insulation at the cavity space.
 - a. Minimum R-value of 6.1.
 - b. 1.10" thick (R-value 6.7), unless otherwise indicated.
3. Adhesive:

- a. Type recommended by insulation board manufacturer for application indicated.

2.3 CMU FILLED CELL WALL INSULATION

A. MANUFACTURERS:

1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
 - a. Core-Fill 500, as manufactured by Tailored Chemical Products, Inc., Hickory, NC. Phone: (800) 627-1687: www.core-fill500.com.
 - b. R501, as manufactured by PolyMaster, Inc., Knoxville, TN. Phone: (800) 580-3626.
 - c. Core Foam Masonry Foam Insulation by cfiFOAM, Inc., Knoxville, TN. Phone: (800) 656-3626.
2. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

B. MATERIALS:

1. Insulation: Aminoplast foam for injection application.
 - a. Thermal Resistivity: **R/inch equal to R-4.4/inch @ 75 degrees F** mean when tested per either ASTM C-177 or ASTM C518.
 - b. Water Vapor Transmission: Average ≤ 15 perms when tested per ASTM E 96/E96M.
 - c. Potential Heat: ≤ 7700 Btu/lb. when tested per NFPA 259.
 - d. Cured Density: ≤ 1.0 lb/ft³ (dry) when tested per ASTM D 1622.
 - e. Surface Burning Characteristics: Class A - Flame Spread ≤ 25 , Smoke Developed ≤ 450 per ASTM E 84.

C. INSTALLATION:

1. Fill **masonry cells** with foam insulation from exterior face of building.
2. Foam Insulation at exterior concrete block wall **cells**:
 - a. Fill **cells** of concrete masonry with amino-plast foam insulation. Holes for filling cells of masonry shall be drilled at horizontal masonry joint on the exterior side of exposed masonry walls and re-grouted.
 - b. Installed insulation value: **R-10**.
3. Reference Standards:
 - a. ASTM C 177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2004.
 - b. ASTM C518 - 01 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2001.
 - c. ASTM D 1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2004a.
 - d. ASTM D 1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics; 2008.
 - e. ASTM D 2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2006.
 - f. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2008.
 - g. ASTM E 96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2005.

h. NFPA 259 - Standard Test Method for Potential Heat of Building Materials

4. **NOTE: Both Cavity Wall Insulation and CMU Filled Cell Wall Insulation is required at all exterior CMU walls.**

2.4 METAL BUILDING ROOF AND WALL INSULATION – SIMPLE SAVER SYSTEM

A. MANUFACTURERS:

1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
 - a. Thermal Design, Inc., Simple Saver System, Madison, NE
2. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

B. References:

1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E 96 - Standard Test Method for Water Vapor Transmission of Materials in Sheet Form (Procedure B).
3. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
4. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
5. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
6. ASTM C 1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.

C. Design Requirements:

1. Insulating system shall have a continuous vapor barrier inside of building purlins, girts, and insulation to provide complete isolation from inside conditioned air.

D. MATERIALS:

1. Simple Saver System consists of Batt Insulation, Roof Insulation, Wall Insulation, Vapor Barrier Liner Fabric, Thermal Breaks, Straps, and other devices and components in a insulation system.
2. Batt Insulation: ASTM C 991 Type 1; preformed formaldehyde-free glass fiber batt conforming to the following:
 - a. Equal to purlin/girt spacing by manufacturer's standard lengths.
 - b. Unfaced.
3. Roof Insulation: Formaldehyde-free fiberglass batt or fiberglass blanket complying with ASTM C 991 Type 1 and ASTM E 84 with a thermal resistance and thickness as follows:
 - a. Upper Layer: **R-11**; 3-1/2 inches (89 mm)
 - b. Bottom Layer: **R-19**; 6 inches (152 mm).
 - c. U Factor 0.035 (**R30**) installed.
4. Wall Insulation: Formaldehyde-free fiberglass blanket or batt complying with ASTM C 991 Type 1, ASTM E 136 and ASTM E 84 with a thermal resistance and thickness as follows:
 - a. **R-25**, U Factor U-0.040.
5. Vapor Barrier Liner Fabric: Syseal® type woven, reinforced, high-density polyethylene yarns coated on both sides with a continuous white or colored polyethylene coatings, as follows:

- a. Product complies with ASTM C 1136, Types I through Type VI.
 - b. Perm rating: 0.02 for fabric and for seams in accordance with ASTM E 96.
 - c. Flame/Smoke Properties: 1) 25/50 in accordance with ASTM E 84. 2) Self-extinguishes with field test using matches or butane lighter.
 - d. Ultra violet radiation inhibitor to minimum UVMAX® rating of 8.
 - e. Size and seaming: Manufactured in large custom pieces by extrusion welding from roll goods and fabricated to substantially fit defined building area with minimum practicable job site sealing.
 - f. Provide with factory double, extrusion welded seams. Stapled seams or heat-melted seams are not acceptable due to degradation of fabric.
 - g. Factory-folded to allow for rapid installation.
 - h. Color: To be selected by Architect after bid date from manufactures standards.
6. Vapor Barrier Lap Sealant:
- a. Solvent-based, Simple Saver polyethylene fabric adhesive.
7. Vapor Barrier Tape:
- a. Double-sided sealant tape 3/4 inch (19 mm) wide by 1/32 inch (.79 mm) thick.
8. Vapor Barrier Patch Tape:
- a. Single-sided, adhesive backed sealant tape 3 inches (76 mm) wide made from same material as Syseal® type liner fabric.
- 9. Thermal Breaks:**
- a. Provide thermal blocks/breaks at all roof to purlin connections points.**
 - b. 1/8 inch (3 mm) thick by 3 inch (76 mm) wide white, closed-cell polyethylene**
 - c. foam with pre-applied adhesive film and peel-off backing.**
10. Straps:
- a. 100 KSI minimum yield tempered, high-tensile-strength steel.
 - b. Size: Not less than 0.020 inch (0.50 mm) thick by 1 inch (25 mm) by continuous length.
 - c. Galvanized, primed, and painted to match specified finish color on the exposed side.
 - d. Color: As selected from manufactures standards
11. Primed and painted to match specified finish color on the exposed side.
12. High-tensile-strength stainless steel.
- a. Woven polyester plastic. As selected from manufactures standards
13. Fasteners:
- a. For light gage steel: #12 by 3/4 (19 mm) inch plated Tek 2 type screws with sealing washer, painted to match specified color.
 - b. For heavy gage steel: #12 by 1-1/2 inch (38 mm) plated Tek 4 type screws with sealing washer, painted to match specified color.
 - c. For wood, concrete, other materials: As recommended by manufacturer.
14. Wall Insulation Hangers:
- a. Fast-R preformed rigid hangers, 32 inch (813 mm) long galvanized steel strips with barbed arrows every 8 inches (203 mm) along its length.

E. INSTALLATION:

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INSULATION
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1. General:
 - a. Install pre-engineered building insulation system in accordance with manufacturer's installation instructions and the approved shop drawings.
 - b. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
 - c. Install in exterior spaces without gaps or voids. Do not compress insulation.
 - d. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
 - e. Fit insulation tight in spaces and tight to exterior side of the sealed liner fabric and around mechanical and electrical services within plane of insulation.
2. Roof Insulation Installation:
 - a. Straps:
 - i. Cut straps to length and install in the pattern and spacings indicated on shop drawings.
 - ii. Tension straps to required value.
 - b. Vapor Barrier Fabric:

Install vapor barrier fabric in large one-piece custom fabricated pieces to substantially fit defined building areas with minimum practicable job site sealing.

 - i. Position pre-folded fabric on the strap platform along one eave purlin.
 - ii. Clamp the two bottom corners at the eave and also centered on the bay.
 - iii. Pull the other end of the pleat-folded fabric across the building width on the strap platform, pausing only at the ridge to fasten the straps and fabric in position where plane of roof changes and to release temporary fasteners on the opposite ridge purlins.
 - iv. Once positioned, install fasteners from the bottom side at each strap/purlins intersection.
 - v. Trim edges and seal along the rafters.
 - vi. All seams must be completely sealed and stapled seams not acceptable.
 - c. Insulation:
 - i. Unpack, and shake to a thickness exceeding the specified thickness.
 - ii. Ensure that cavities are filled completely with insulation.
 - iii. Place on the vapor barrier liner fabric without voids or gaps.
 - iv. Place top layer of insulation over and perpendicular to the purlins without voids or gaps, as roof sheathing is applied.
 - v. Place thermal block on top of purlins or bottom of purlins for retrofit work if no other thermal break exists.
 - vi. Place new insulation between purlins at the required thickness for the R-value specified.
 - d. Seal vapor barrier fabric to the wall fabric and elsewhere as required to provide a continuous vapor barrier.
3. Wall Insulation Installation:
 - a. Install thermal break to exterior surface of girts as wall sheathing is applied.
 - b. Install self-sticking foam thermal break to interior surface of girts prior to installation of insulation.

- c. Position and secure Fast-R hangers to girts on the inside face of the wall sheathing.
 - d. Cut insulation to required lengths to fit vertically between girts.
 - e. Fluff the insulation to the full-specified thickness.
 - f. Neatly position in place and secure to Fast-R hangers.
 - g. Ensure that cavities are filled completely with insulation.
4. Vapor Barrier Fabric:
- a. Install vapor barrier fabric in large one-piece custom fabricated pieces to substantially fit defined building areas with minimum practicable job site sealing.
 - b. Apply the vapor barrier fabric by clamping it in position over eave strap and installing fasteners through the eave strap into each roof strap, permanently clamping the wall fabric between them.
 - c. Once in position, draw the vapor barrier fabric down over the column flanges to the base angle and install vertical straps along each column and 5 feet 0 inches on center, maximum, fastening to each girt to retain system permanently in place.
 - d. All seams must be completely sealed and stapled seams not acceptable.
5. Seal wall fabric to the roof fabric, to the base angle and up the columns to provide a continuous vapor barrier.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION

- A. Installer must examine substrates and conditions under which insulation work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with insulation work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- B. Clean substrates of substances harmful to insulations or vapor barriers, including removal of projections which might puncture vapor barriers.
- C. Close off openings in cavities to receive poured-in-place and insulation, sufficiently to prevent escape of insulation. Provide bronze or stainless steel screen (inside) where openings must be maintained for drainage or ventilation.

3.2 INSTALLATION

- A. General: Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.
- B. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

3.3 CAVITY WALL INSULATION

- A. On units of plastic insulation, install small pads of adhesive spaced approximately 1'-0" o.c. both ways on inside face. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
 - 1. Fill all cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.4 PROTECTION

- A. General: Protect installed insulation and vapor barriers from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure. Installer shall advise Contractor of exposure hazards, including possible sources of deterioration and fire hazards.

END OF SECTION

SECTION 07240 - EXTERIOR INSULATION AND FINISH 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. Extent of each type of exterior insulation and finish system work is indicated on drawings and by provisions of this section. Composite wall cladding of rigid insulation and reinforced finish coating ("Class PB").
- B. Types of work specified in this section include the following:
 - 1. Application of insulation to gypsum sheathing substrate.
 - 2. Application of plastic veneer base, reinforced with woven-glass fiber fabric, to insulation board.
 - 3. Drainage and water-resistive barriers behind insulation board.
 - 4. Application of plastic coating finish with integral color and texture.

1.3 REFERENCE STANDARDS

- A. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2011.
- B. ASTM C297/C297M - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions; 2004 (Reapproved 2010).
- C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2012.
- D. ASTM C1397 - Standard Practice for Application of Class PB Exterior Insulation and Finish Systems (EIFS) and EIFS with Drainage; 2009.
- E. ASTM D968 - Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive; 2005 (Reapproved 2010).
- F. ASTM D2247 - Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity; 2011.
- G. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
- H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.
- I. ASTM E2273 - Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies; 2003 (Reapproved 2011).
- J. ICC-ES AC219 - Acceptance Criteria for Exterior Insulation and Finish Systems; 2009.
- K. ICC-ES AC235 - Acceptance Criteria for EIFS Clad Drainage Wall Assemblies; 2004 (Editorially revised 2009).
- L. NFPA 268 - Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source; 2012.

1.4 QUALITY ASSURANCE

- A. EIFS Manufacturer Qualifications: Provide all EIFS products other than insulation from the same manufacturer with qualifications as follows:
 - 1. Member in good standing of EIMA (EIFS Industry Members Association).
 - 2. Manufacturer of EIFS products for not less than 5 years.

3. Manufacturing facilities ISO 9001 certified.
- B. Insulation Manufacturer Qualifications: Approved by manufacturer of EIFS and approved and labeled under third party quality program as required by applicable building code.
- C. Applicator:
 1. Application of the system shall be by an applicator approved by the manufacturer, with at least five (5) years experience in the installation of this system.
 2. Follow manufacturer's latest printed application instructions. Installer is to certify that work is installed in accordance with manufacturer's instruction.
- D. Samples:
 1. Submit 2'-0" x 4'-0" sample color and texture to be used.
 2. Samples to be made by applicator utilizing tools and techniques proposed for installation.
- E. Code Approvals:
 1. The system shall be approved by the building codes or agencies with jurisdiction on the project.
 2. Approval must be based on full scale diversified Fire Testing and its end use configuration by independent agencies whose classifications and requirements have general acceptance as regulatory.
 3. System must maintain the current model code approvals of ICBO #2728, BOCA #71-55, SBCC #7218-78.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, installation instructions and general recommendations for each specified material and product.

1.6 JOB CONDITIONS

- A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.
- B. Application of this work shall be in ambient temperatures above 40 degree F. and rising, and on unfrozen surfaces. For installation in temperatures less than 40 degree F., supplementary heat shall be provided. A minimum ambient temperature of 40 degree F shall be maintained for at least 24 hours after installation.
- C. Protect surrounding areas and surfaces to preclude damage during application of this work. Protect finished work when stopping for the day or when completing an area in order that water will not penetrate behind the system.
- D. Coordinate the work of this section closely with other related sections. The cap flashing shall be installed as soon as possible after the installation of this work. All joints to be caulked shall be done immediately after the installation.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to project site in manufacturer's original, unopened containers with labels intact. Inspect materials and notify manufacturer of any discrepancies.
- B. Storage: Store materials as directed by manufacturer's written instructions.
 1. Protect adhesives and finish materials from freezing, temperatures below 40 degrees F and temperatures in excess of 90 degrees F.
 2. Protect insulation materials from exposure to sunlight.

1.8 SPECIAL PROJECT WARRANTY

Site Improvements and Interior Alterations to
Fairhope High School for the
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EXTERIOR INSULATION AND FINISH SYSTEM
07240-2

- A. Provide a Five (5) year warranty against defective materials and workmanship, signed by manufacturer of exterior insulation and finish system and the manufacturer's certified applicator, agreeing to repair or replace defective materials and workmanship at no cost to the Owner.

1.9 MOCK-UP

- A. Construct mock-up of typical EIFS application on specified substrate, size as required to include examples of all key conditions, and including flashings, joints, and edge conditions.
- B. Locate mock-up at approved location convenient for comparison to finished work.
- C. Mock-up may not remain as part of the Work.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Senergy "Senerflex Channeled Adhesive Design" (Basis of Design)
 - 2. Dryvit System, Inc., West Warwick, RI
 - 3. STO Industries, Inc., Rutland, VT
 - 4. Parex, Inc., P.O. Box 189, Redan, GA
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid date.

2.2 EXTERIOR INSULATION AND FINISH SYSTEM

- A. Exterior Insulation and Finish System: DRAINAGE type; reinforced finish coating on flat-backed insulation board adhesive-applied directly to water-resistive coating using Vertical notched trowel application of adhesive over substrate; provide a complete system that has been tested to show compliance with the following characteristics; include all components of specified system and substrate(s) in tested samples.
- B. Substrate shall be 5/8" exterior grade fiberglass faced (treated core) gypsum sheathing, equal to Georgia Pacific Dens-Glass Gold or BPB Glasroc Premium exterior sheathing, complying with ASTM C-79. Substrate shall be installed according to recommendations of substrate material manufacturer for application intended.
- C. Allowable Wind Loading: At least 25 psf, positive and negative, determined in accordance with ICC-ES AC 219 or AC 235, using factor of safety of 3.0.
- D. Fire Characteristics:
 - 1. Flammability: Pass, when tested in accordance with NFPA 285.
 - 2. Ignitibility: No sustained flaming when tested in accordance with NFPA 268.
- E. Adhesion of Water-Resistive Coating to Substrate: For each combination of coating and substrate, minimum flatwise tensile bond strength of 15 psi, when tested in accordance with ASTM C297/C297M.
- F. Adhesion to Water-Resistive Coating: For each combination of insulation board and substrate, when tested in accordance with ASTM C297/C297M, maximum adhesive failure of 25 percent unless flatwise tensile bond strength exceeds 15 psi in all samples.
- G. Water Penetration Resistance: No water penetration beyond the plane of the base coat/insulation board interface after 15 minutes, when tested in accordance with ASTM E331 at 6.24 psf differential pressure with tracer dye in the water spray; include in tested sample at least two vertical joints and one horizontal joint of same type to be used in construction; disassemble sample if necessary to determine extent of water penetration.

- H. Drainage Efficiency: Average minimum efficiency of 90 percent, when tested in accordance with ASTM E2273 for 75 minutes.
- I. Salt Spray Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating after 300 hours exposure in accordance with ASTM B117, using at least three samples matching intended assembly, at least 4 by 6 inches in size.
- J. Freeze-Thaw Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating when viewed under 5x magnification after 10 cycles, when tested in accordance with ICC-ES AC 219 or 235.
- K. Weathering Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating when viewed under 5x magnification after 2000 hours of accelerated weathering conducted in accordance with ASTM G153 Cycle 1 or ASTM G155 Cycle 1, 5, or 9.
- L. Water Degradation Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating after 14 days exposure, when tested in accordance with ASTM D2247.
- M. Mildew Resistance: No growth supported on finish coating during 28 day exposure period, when tested in accordance with ASTM D3273.
- N. Abrasion Resistance Of Finish: No cracking, checking or loss of film integrity when tested in accordance with ASTM D968 with 500 liters of sand.

2.3 MATERIALS

- A. Finish Coating Top Coat: Water-based, air curing, acrylic or polymer-based finish with integral color and texture.
 - 1. Texture: Fine.
 - 2. Colors: As selected by Architect from manufacturer's full range.
- B. Base Coat: Fiber-reinforced, acrylic or polymer-based product compatible with insulation board and reinforcing mesh.
- C. Reinforcing Mesh: Balanced, open weave glass fiber fabric, treated for compatibility and improved bond with coating, weight, strength, and number of layers as required to meet required system impact rating.
- D. Insulation Board: Molded, expanded polystyrene board; ASTM C578, Type I; with the following characteristics:
 - 1. Board Size: 24 by 48 inches.
 - 2. Board Size Tolerance: plus/minus 1/16 inch from square and dimension.
 - 3. Board Thickness: As indicated on drawings, but not less than 1 inch at any location.
 - 4. Thickness Tolerance: plus/minus 1/16 inch maximum.
 - 5. Board Edges: Square.
 - 6. Thermal Resistance: Provide 2" for a total R value of 7.2. (R factor per 1 in (25.4 mm) at 75 degrees F: 3.60).
 - 7. Board Density: 0.9 lb/cu ft.
 - 8. Compressive Resistance: 10 psi.
 - 9. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, when tested in accordance with ASTM E84.
- E. Water-Resistive Barrier Coating: Fluid-applied air and water barrier membrane; applied to sheathing; furnished or approved by EIFS manufacturer.

- F. Fluid-Applied Flashing: Flexible water based polymer material suitable for use with reinforcing mesh and, if used with water-resistive barrier sheet, certified compatible with sheet material.
- G. Flashing Tape: Self-adhering rubberized asphalt tape with polyethylene backing or other material and surface conditioner furnished or approved by EIFS manufacturer.

2.4 ACCESSORY MATERIALS

- A. Insulation Adhesive: Type required by EIFS manufacturer for project substrate.
- B. Trim: EIFS manufacturer's standard PVC, galvanized steel, or clear anodized aluminum trim accessories, as required for a complete project and including starter track and drainage accessories.
- C. Sealant: Refer to Division 7 Joint Treatment (Sealants) Section. Installation of EIFS Joint Sealant shall be by EIFS applicator or a separate installer under direct supervision and control of EIFS applicator. Joint Sealant installer shall be experienced and competent in the installation of elastomeric construction sealants.

PART 3 – EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Install in accordance with EIFS manufacturer's instructions and ASTM C1397.
- B. Where different requirements appear in either document, comply with the most stringent.
- C. Neither of these documents supercedes the provisions of the Contract Documents that define the contractual relationships between the parties or the scope of work.

3.2 EXAMINATION

- A. Verify that substrate is sound and free of oil, dirt, other surface contaminants, efflorescence, loose materials, or protrusions that could interfere with EIFS installation and is of a type and construction that is acceptable to EIFS manufacturer. Do not begin work until substrate and adjacent materials are complete and thoroughly dry.
- B. Verify that substrate surface is flat, with no deviation greater than 1/4 in when tested with a 10 ft straightedge.

3.3 INSTALLATION - WATER-RESISTIVE BARRIER

- A. Apply barrier coating as recommended by coating manufacturer; prime substrate as required before application.
- B. Seal all substrate transitions and intersections with other materials to form continuous water-resistive barrier on exterior of sheathing, using method recommended by manufacturer.
- C. At door and window rough openings and other wall penetrations, seal water-resistive barrier and flexible flashings to rough opening before installation of metal flashings, sills, or frames, using method recommended by manufacturer.
- D. At moving expansion joints, apply flexible flashing or flashing tape across and recessed into joint with U-loop forming continuous barrier but allowing movement.
- E. Lap flexible flashing or flashing tape at least 2 inches on each side of joint or transition.
- F. Install drainage layer or spacers after flashing tape has been completed.

3.4 INSTALLATION – INSULATION

- A. Install in accordance with manufacturer's instructions.
- B. Prior to installation of boards, install starter track and other trim level and plumb and securely fastened.
- C. Install only in full lengths, to minimize moisture intrusion; cut horizontal trim tight to vertical trim.

- D. Install back wrap reinforcing mesh at all openings and terminations that are not to be protected with trim.
- E. On wall surfaces, install boards vertically.
- F. Place boards in a method to maximize tight joints. Stagger vertical joints and interlock at corners. Butt edges and ends tight to adjacent board and to protrusions. Achieve a continuous flush insulation surface, with no gaps in excess of 1/16 inch.
- G. Fill gaps greater than 1/16 inch with strips or shims cut from the same insulation material.
- H. Rasp irregularities off surface of installed insulation board.
- I. Adhesive Attachment: Use method required by manufacturer to achieve drainage efficiency specified; do not close up drainage channels when placing insulation board.

3.5 INSTALLATION – FINISH

- A. Base Coat: Apply in thickness as necessary to fully embed reinforcing mesh, wrinkle free, including back-wrap at all terminations of the EIFS. Install reinforcing fabric as recommended by EIFS manufacturer.
 - 1. Lap reinforcing mesh edges and ends a minimum of 2-1/2 inches.
 - 2. Allow base coat to dry a minimum of 24 hours before next coating application.
- B. Heavy Duty Reinforcing: At locations indicated, install second layer of reinforcing mesh embedded in second coat of base coating, tightly butting ends and edges of mesh.
 - 1. Provide heavy duty reinforcing at all EIFS surfaces less than 48 inches above grade, and elsewhere as indicated.
- C. Apply finish coat after base coat has dried not less than 24 hours and finish to a uniform texture and color.
- D. Provide V-groove scored control joints at locations indicated on drawings and in accordance with manufacturer's recommendations.
- E. Finish Coat Thickness: As recommended by manufacturer.

3.6 INSTALLATION – ACCESSORIES

- A. Reveal and Trim Accessories: Install in accordance with manufacturer's recommendations.

3.7 CLEANING

- A. Clean EIFS surfaces and work areas of foreign materials resulting from EIFS operations.

3.8 PROTECTION

- A. Protect completed work from damage and soiling by subsequent work.

END OF SECTION

SECTION 07500 - MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawing 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. The roofing contractor shall be fully knowledgeable of all requirements of the contract documents and shall make themselves aware of all job site conditions prior to the bid that will affect their work.
- B. Provide all labor, material, tools, equipment, and supervision necessary to furnish and install a **60** mil white reinforced TPO (Thermoplastic Polyolefin) or a **60** mil **PVC** (polyvinyl chloride) membrane.
- C. **NOTE: PVC (polyvinyl chloride) membrane is required at all Kitchen Roof areas.**

1.3 SUBMITTALS

- A. Prior to starting work, the roofing contractor must submit the following:
 - 1. Shop drawings showing layout of insulation, details of construction and identification of materials.
 - 2. Sample of the manufacturer's Membrane System Warranty.
 - 3. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system.
 - 4. Certification of the manufacturer's warranty reserve.
- B. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened containers or wrappings with the manufacturer's name, brand name and installation instructions intact and legible. Deliver in sufficient quantity to permit work to continue without interruption. Comply with the manufacturer's written instructions for proper material storage.
 - 1. Store the **TPO and PVC** membranes in the original undisturbed plastic wrap in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. Thermoplastic membrane that has been exposed to the elements for approximately seven (7) days must be prepared with appropriate cleaner prior to hot air welding.
 - 2. Store curable materials (adhesives and sealants) between 60°F and 80°F in dry areas protected from water and direct sunlight. If exposed to lower temperature, restore to 60°F minimum temperature before using.
 - 3. Store materials containing solvents in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use before expiration of their shelf life.
 - 4. Insulation must be on pallets, off the ground and tightly covered with waterproof materials.
 - 5. Any materials, which are found to be damaged, shall be removed and replaced at the applicator's expense.

1.5 WORK SEQUENCE

- A. Schedule and execute work to prevent leaks and excessive traffic on completed roof sections. Care should be exercised to provide protection for the interior of the building and to ensure water does not flow beneath any completed sections of the membrane system.

- B. Do not disrupt activities in occupied spaces.

1.6 JOB SITE PROTECTION

- A. The roofing contractor shall adequately protect building, paved areas, service drives, lawn, shrubs, trees, etc. from damage while performing the required work. Provide all materials as necessary for protection and remove protection material at completion. The contractor shall repair or be responsible for costs to repair all property damaged during the roofing application.
- B. If during the roofing contractor's performance of the work the building owner continues to occupy the existing building, the contractor shall take precautions to prevent the spread of dust and debris, particularly where such material may sift into the building. The roofing contractor shall provide labor and materials to construct, maintain and remove necessary temporary enclosures to prevent dust or debris in the construction area(s) from entering the remainder of the building.
- C. Do not overload any portion of the building, by either use of or placement of equipment, storage of debris, or storage of materials.
- D. Protect against fire and flame spread. Maintain proper and adequate fire extinguishers.
- E. Take precautions to prevent drains from clogging during the roofing application.
- F. Remove debris at the completion of each day's work and clean drains, if required. At completion, test drains to ensure the system is free running and drains are watertight. Remove strainers and plug drains in areas where work is in progress. Install flags or other telltales on plugs. Remove plugs each night and screen drain.
- G. Store moisture susceptible materials above ground and protect with waterproof coverings.
- H. Remove all traces of piled bulk materials and return the job site to its original condition upon completion of the work.

1.7 SAFETY

- A. The roofing contractor shall be responsible for all means and methods as they relate to safety and shall comply with all applicable local, state, and federal requirements that are safety related. Safety shall be the responsibility of the roofing contractor. All related personnel shall be instructed daily to be mindful of the full time requirement to maintain a safe environment for the facility's occupants including staff, visitors, customers, and the occurrence of the public on or near the site.

1.8 WORKMANSHIP

- A. Applicators installing new roof, flashing and related work shall be factory trained and approved by the manufacturer they are representing.
- B. All work shall be of highest quality and in strict accordance with the manufacturer's published specifications and to the building owner's satisfaction.
- C. There shall be a supervisor on the job site at all times while work is in progress.

1.9 QUALITY ASSURANCE

- A. The Contractor shall engage the services of a Professional Roof Consultant. The Consultant must hold a minimum title of Registered Roof Observer (RRO) through the International Institute of Building Enclosure Consultants (IIBEC) and provide evidence of adequate insurance as required below. The Consultant should perform three (3) inspections during the installation of each new roof system type (1 – Start up inspection; 2 – Interim inspection; 3 – Final inspection). The Consultant must document all site visits with photographs and written reports. All reports shall be forwarded to the Architect with documentation of the roofing progress and any deficiencies noted during the inspections. Upon completion of all punch list items, the Consultant should provide a letter of roof completion advising the new roof systems meet and/or exceed the project requirements. ***(Note: Although the contractor will be paying the roof consultant from their proceeds, the roof consultant will be considered an agent of the owner and architect throughout the project and will perform the required inspections on behalf of the owner)***

and architect. The above specification shall be applied to individual facilities when multiple site locations are included in the project.)

1. Roof Consultant Insurance Requirements:
 - a. Gen. Liability - \$1,000,000 each occurrence - \$2,000,000 General Aggregate / Auto. Liability - \$1,000,000 / Umbrella Liability. - \$1,000,000 / Workers Compensation - \$1,000,000 per statute / Professional Liability - \$1,000,000
2. Approved Roof Consulting Firm:
 - a. Roof Asset Management, Inc. | David Lee, RRO, CIT, FAA-107 | 4950 Woodfield Drive, Millbrook, Alabama 36054 | (334) 590-7999.
 - b. Professional Roof Observers, LLC.
1200 Sumac Road
Pulaski, TN 38478
Kevin Turner / (931) 703-6018 / kturner@professionalroofobservers.net.
 - c. Substitutions: Roof consulting firms must be pre-approved by the Architect. Requests for a substituting firm must be submitted "In writing" 10 (Ten) days prior to the bid opening.
- C. The Contractor shall provide signed certification from the Roofing Manufacturer that the roof design provided for this project complies with the performance requirements as set forth by applicable applications in IBC Chapter 15, Section 1504.
 1. The certification shall be attached to the Roof Warranty provided at the close out of the project.
 2. Contractor shall submit a copy of his Manufacturer's Warranty Notification prior to purchase of materials and start of work.
- D. Roof system will meet the requirements of all federal, state and local code bodies having jurisdiction.
- E. The TPO or PVC membrane roofing system must achieve a UL Class A and the appropriate FM rating.
- F. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.
- G. Impact Resistance: Roof coverings installed on low-slope roofs (roof slope <2:12) shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the "Resistance to Foot Traffic Test "FM 4470.
- H. Drainage:
 1. Provide a roof system with positive drainage where all standing water dissipates within 48 hours after precipitation ends.
- I. All roof curbs and penetrations shall have a minimum height of 8" above the completed roof system.
- J. Roof curbs shall be installed in accordance with roofing system manufactures instructions.
- K. **The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the Architect /owners representative.**
- L. Provide adequate number of experienced workers regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.
- M. There shall be no deviations made from this specification or the approved shop drawings without

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the prior written approval of the Architect. Any deviation from the manufacturer's installation procedures must be supported by a written certification on the manufacturer's letterhead and presented for the Architects consideration.

- N. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to determine whether corrective work will be required before the warranty will be issued. Notify the Architect and General Contractor seventy-two (72) hours prior to the manufacturer's final inspection.

1.10 JOB CONDITIONS, CAUTIONS, AND WARNINGS

- A. Material Safety Data Sheets (MSDS) must be on location at all times during the transportation, storage, and application of materials.
- B. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.
- C. When loading materials onto the roof, the Authorized Roofing Applicator must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.
- D. Proceed with roofing work only when weather conditions comply with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.
- E. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.
- F. Provide protection, such as 3/4 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
- G. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.
- H. New roofing shall be complete and weather tight at the end of the workday.
- I. Contaminants such as grease, fats, and oils shall not be allowed to come in direct contact with the roofing membrane.

1.11 WARRANTY

- A. Compatibility: Provide products which are recommended by manufacturers to be fully compatible with indicated substrates or provide separation materials as required to eliminate contact between incompatible materials.
- B. **Provide manufacturer's 20-year NDL total system warranty covering both labor and material with no dollar limitation and cover all penetrations.**
- C. **General Contractor shall provide the General Contractor's 5-year Roofing Guarantee included in this manual.**
- D. Pro-rated system warranties shall not be accepted.
- E. Evidence of the manufacturer's warranty reserve shall be included as part of the project submittals for the specifier's approval.
- F. All roof warranties shall be provided to the Owner, by the Contractor at the Final Inspection to obtain the Substantial Completion.
- G. The roof insulation shall be covered under the roof warranty as required by the manufacturer.

- H. ***Standard manufacturer's roofing guarantees which contain language regarding the governing of the guarantee by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such guarantees.***
- I. The roofing manufacturer shall be required to provide documentation certifying that the roof design provided complies with the performance requirements as set forth in IBC Chapter 15, Section 1504. The documentation shall be attached to the roof warranty at the close out of the project.

PART 2 – PRODUCTS

2.1 GENERAL

- A. **All components of the specified roofing system shall be products of the manufacturer of the roofing system or accepted by the manufacturer as compatible. All products (including insulation, fasteners, fastening plates and edgings) must be manufactured and supplied by the roofing system manufacturer and covered by the warranty.**

B. MANUFACTURERS

1. TPO 60 Mil Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - a. GAF – Everguard (Basis of Design)
 - b. Versico Roofing - Versiweld with Octguard XT
 - c. Firestone – Ultraply
 - d. Johns Manville, Inc.
 - e. Carlisle Syntec Systems
2. PVC 60 Mil Manufactures: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - a. GAF Commercial (Basis of Design)
 - b. Versico Roofing - VersiFlex Roofing
 - c. DuroLast Roofing
 - d. Johns Manville, Inc.
 - e. Sarnafil Roof Membrane Roofing
 - f. Fibertite Roofing
 - g. Carlisle Syntec Systems
4. Walkway Pads: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - a. Roof Trak III Walkway Pads as manufactured by Durolast.
 - i. Non-skid, maintenance free walkway protection pad manufactured from recycled membrane and oriented-strand polyester reinforcement. Factory attached, 4 inch wide white membrane skirts for attachment to the field membrane by heat welding (hot-air).
 - ii. Size: 30" x 60".
 - iii. Color: White with Safety Yellow skirts.
 - iv. Install per manufacturers recommendations.

3. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 ADHESIVES AND CLEANERS

- A. All products shall be furnished by the roofing manufacturer and specifically formulated for the intended purpose.
 1. Bonding Adhesive: **60 Mil:** Manufactures recommended Bonding Adhesive
 2. Edge Sealant: Cut Edge Sealant
 3. Sealer: Water Cut-Off Mastic
 4. Pocket Sealant: Manufactures recommended Molded Pocket Sealant
 5. Cleaner: Manufactures recommended Membrane Cleaner
- B. The Contractor shall be responsible for ensuring all existing curbs / flashings shall be raised as necessary to ensure proper flashing heights.

PART 3 - EXECUTION

3.1 PRE-ROOFING CONFERENCE

- A. A pre-roofing conference is required before any roofing materials are installed. This conference shall be conducted by a representative of the Architect. Required attendees include representatives of the Owner, Division of Construction Management Inspector, General Contractor, Roofing Contractor, Sheet Metal Contractor, Roof Deck Manufacturer (if applicable), Roofing Materials Manufacturer (if warranty is required of this manufacturer) and all installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment. ATTENDANCE OF THE CONTRACTOR'S FOREMAN IS MANDATORY. If equipment of substantial size is to be placed on the roof, the Mechanical Contractor must also attend this meeting. Provide at least 72 hours advance notice to participants prior to convening pre-roofing conference.
- B. The pre-roofing conference is intended to clarify demolition and application requirements for work to be completed before roofing operations can begin. This would include a detailed review of the specifications, roof plans, roof deck information, flashing details, and approved shop drawings, submittal data, and samples. If conflict exists between the specifications and the Manufacturer's requirements, this shall be resolved. If this pre-roofing conference cannot be satisfactorily concluded without further inspection and investigation by any of the parties present, it shall be reconvened at the earliest possible time to avoid delay of the work. In no case should the work proceed without inspection of all roof deck areas and substantial agreement on all points.
- C. The following are to be accomplished during the conference:
 1. To review all Factory Mutual and Underwriters Laboratories requirements listed in the specifications and resolve any questions or conflicts that may arise.
 2. To establish trade-related job schedules, including the installation of roof mounted mechanical equipment.
 3. To establish roofing schedule and work methods that will prevent roof damage.
 4. Require that all roof penetrations and walls be in place prior to installing the roof.
 5. To establish those areas on the job site that will be designated as work and storage areas for roofing operations.
 6. To establish weather and working temperature conditions to which all parties must agree.
 7. To establish acceptable methods of protecting the finished roof if any trades must travel across or work on or above any areas of the finished roof.
 8. Tour representative areas of roofing substrates (decks); inspect and discuss condition of

substrate, penetrations and other preparatory work performed by other trades.

9. Review structural loading limitations of deck and inspect deck for proper installation and fastening as required. Inspect deck for required slope etc.
10. Review roofing system requirements (drawings, specifications and other contract documents). Review required submittals / warranty issues. Verify that the manufacturer's label contains references to specified ASTM standards.
11. Review and finalize construction schedule related to roofing work and verify availability of materials.
12. Review roof application procedures, technique, details and roof specifics. Maintain one copy of manufacturer's application instructions on the project site.
13. Review job specific safety requirements, safety barriers, street blocking, haul routes, building access, site contact, facilities, security, etc.

- C. The Architect shall prepare a written report indicating actions taken and decisions made at this pre-roofing conference. This report shall be made a part of the project record and copies furnished the General Contractor, the Owner, the Division of Construction Management, and the Division of Construction Management Inspector.

3.1 INSTALLATION - GENERAL

- A. Comply with the manufacturer's published instructions for the installation of the membrane roofing system including proper substrate preparation, jobsite considerations, and weather restrictions.
- B. Position sheets to accommodate contours of the roof deck and shingle splices to avoid bucking water.

3.2 EXECUTION – NEW ROOF SYSTEMS

A. Installation of New Roof System as follows:

1. Roof Insulation
 - a. Tapered/non-tapered polyisocyanurate insulation.
 - i. Refer to Section 07510, Roof Insulation
 - b. Cover board
 - i. 1/2", 100 psi. ISO HD board
 - a) Mechanically Attached
 - c. Must maintain a minimum total R value of 25 at any area.
2. Membrane
 - a. **60 mil white reinforced TPO or PVC** membrane
 - i. Adhered in accordance with the manufacturer's most current specifications and details.
 - b. **60 mil TPO or PVC** membrane flashings and associated metal components as required.
3. Warranties
 - a. Provide a **20-year** NDL manufacturer's warranty
 - b. Provide a **5-year** General Contractor's Roofing Guarantee workmanship warranty found in Contract Forms section of this manual.

3.3 INSULATION PLACEMENT AND ATTACHMENT

- A. Install insulation or membrane underlayment over the substrate with boards butted tightly together with no joints or gaps greater than 1/4 inch. Stagger joints both horizontally and

vertically if multiple layers are provided.

- B. Secure insulation to the substrate with the required fasteners and plates in accordance with manufacturers specifications.

3.4 60 Mil TPO or PVC MEMBRANE PLACEMENT AND ATTACHMENT

- A. Unroll and position membrane without stretching. Provide and secure both perimeter and field membrane sheets in accordance with the manufacturer's most current specifications and details.
- B. Secure the membrane with the required Fasteners and Plates spaced as required per the manufacturer's requirements to meet the appropriate up-lift at perimeters, curbs, penetrations, drains, etc. with field of sheets fully adhered in the manufacturer's recommended adhesive.
- C. Install adjoining membrane sheets in the same manner in accordance with the manufacturer's specifications.
- D. Hot air weld the membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's specifications. At all splice intersections, roll the seam with a silicone roller prior to membrane seam cooling. All splice intersections shall be overlaid with membrane non-reinforced flashing.
- E. Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).
- F. Repair all seam deficiencies the same day they are discovered.
- G. Apply Cut Edge Sealant on all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete.

3.5 FLASHING

- A. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using TPO or PVC reinforced membrane. Non-reinforced membrane can be used for flashing pipe penetrations, Sealant Pockets, scuppers, as well as inside and outside corners when the use of pre-fabricated accessories is not feasible.
- B. TPO/PVC Coated Metal Flashings:
 - 1. Install new 24 gauge TPO/PVC coated metal flashings at all locations requiring the new TPO/PVC membrane to lap/weld over the metal flange. Install TPO/PVC metal flashings in lengths no less than 10'-0" unless necessary to fit shorter conditions.
- C. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.6 WALKWAYS

- A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the drawings.
- B. Hot air weld walkway pads to the membrane in accordance with the manufacturer's specifications.

3.7 DAILY SEAL

- A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the workday, a daily seal must be performed to close temporarily the membrane to prevent water infiltration.
- B. Complete an acceptable membrane seal in accordance with the manufacturer's requirements.

3.8 CLEAN UP

- A. Perform daily clean up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.

- B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

END OF SECTION

SECTION 07510 - MEMBRANE ROOF INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawing 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. This Section applies to insulation products to be used in conjunction with Section 07500.
- B. Extent of roof insulation is indicated on drawings.
- C. All Roof insulation above decking is specified in this section.
 - 1. Install **tapered and/or non-tapered** polyisocyanurate insulation with new membrane roofing system **as described at each roofing system in Section 07500, Membrane Roofing.**

1.3 QUALITY ASSURANCE

- A. Insulation Manufacturer: Obtain primary roof insulation from the roofing membrane manufacturer.
- B. Roof System Manufacturer: Shall provide the insulation products which are required to meet its Warranty requirements, as well as Wind Code requirements.
- C. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification necessary in connection with fire and extended coverage insurance on roofing and associated work.
- D. Thermal Resistivity: Where thermal resistivity properties of insulating materials are designed by r-values, they represent the rate of heat flow through a homogenous material exactly 1" thick, measured by test method included in referenced material standard or otherwise indicated. They are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperature indicated.
- E. Fire Performance Characteristics: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. UL Class A Non-Combustible rated system.

1.4 SUBMITTALS

- A. Product Data: Submit specifications, installation instructions and general recommendations from manufacturers of insulation materials, for types of roofing required. Include data substantiating that materials comply with requirements.
- B. Tapered Insulation Design Layout: Submit layout to show insulation elevations at ALL peak and valley locations within each roof section, with direction of slopes shown. Any new drains shall be shown on this layout.

1.5 JOB CONDITIONS

- A. Weather: Proceed with work when existing and forecasted weather conditions permit work to be performed in accordance with manufacturer's recommendations and warranty requirements.

1.6 SPECIAL PROJECT WARRANTY

- A. Compatibility: Provide products which are recommended by manufacturers to be fully compatible with indicated substrates or provide separation materials as required to eliminate contact between incompatible materials.
- B. Membrane Adhesive: As recommended by insulation manufacturer for particular substrate and project conditions, formulated to withstand min. 60 p.s.f. uplift force.

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MEMBRANE ROOF INSULATION
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PART 2 - PRODUCTS

2.1 INSULATING MATERIALS

- A. Provide tapered and/or non-tapered insulation as indicated on the drawings meeting the following:
 - 1. Install polyisocyanurate insulation (slope per roof plan) and as describe in Section 07500, Membrane Roofing.
 - 2. Must maintain a Minimum total R value of 25 at any given roof area.

2.2 MISCELLANEOUS INSULATION MATERIALS

- A. Adhesive for Bonding Insulation (if any required): Type recommended by Roof System Manufacturer, Insta-Stik Foam, or equal, and complying with fire resistance requirements.
- B. Mastic Sealer: Type recommended by Roof System Manufacturer for bonding edge joints and filling voids.
- C. Mechanical Anchors: As recommended by Roof System Manufacturer for deck type, and complying with fire and insurance rating requirements.

PART 3 - EXECUTION

3.1 PREPARATION OF SUBSTRATE

- A. General: Comply with manufacturer's instructions for preparation of substrate to receive insulation.
 - 1. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16" out of plane.
 - 2. Clean substrate of dust, debris, and other substances detrimental to system work. Remove sharp projections.

3.2 INSTALLATION

- A. General: Insulation is required. Extend insulation full thickness in one layer, or in multiple layers over entire surface to be insulated, cutting and fitting tightly around obstructions. Form cant strips, crickets, saddles and tapered areas with additional material as shown and as required for proper drainage of membrane.
 - 1. Stagger all joints in one direction for each course. For multiple layers, stagger joints both directions between courses. Comply with roofing system manufacturer's recommendations.
- B. Do not install more insulation each day than can be covered with membrane before end of day and before start of inclement weather.
- C. Set units in adhesive, applied in accordance with requirements of applicable fire and insurance ratings.
- D. Secure roof insulation with coated mechanical fasteners as required by Manufacturer.

3.3 INSTALLATION

- A. General: Comply with manufacturer's instructions, except where more stringent requirements are indicated.
- B. Roof Manufacturer issuing water-tightness Warranty, agrees to warrant insulation attachment and adhesion as part of its Warranty.

END OF SECTION

SECTION 07600 - FLASHING AND SHEET METAL

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 work of this section.

1.2 DESCRIPTION OF WORK

- A. Extent of each type of flashing and sheet metal work is indicated on drawings and by provisions of this section.
- B. Types of work specified in this section include the following:
 - 1. Eave Strip/Drip Edge
 - 2. Fascia
 - 3. Soffit
 - 4. Gutters
 - 5. Downspouts
- C. Integral masonry flashings are specified as masonry work in sections of Division 4.

1.3 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.
- B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- C. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- E. ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free; 2007, with Editorial Revision (2012).
- F. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007, with Editorial Revision (2012).
- G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.4 SUBMITTALS

- A. Product Data; Flashing, Sheet Metal, Accessories: Submit manufacturer's product data, installation instructions and general recommendations for each specified sheet material and fabricated product.

1.5 JOB CONDITIONS

- A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

PART 2 - PRODUCTS

2.1 SHEET METALS

- A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage thick base metal, shop pre-coated with PVDF (Polyvinylidene Fluoride) coating.

- B. Finish: The exposed finish on all exposed metals and similar items shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning,
 - a. Colors: As selected by Architect after Bid Date, from manufacturer's standard colors including white.

2.2 GUTTERS

- A. Gutters: Provide flat shapes, no rolled formed stiffeners or ribbed allowed. Form gutters in "continuous" sections not less than 8 feet in length, complete with end pieces, outlet tubes and other special pieces as may be required. Join sections with riveted and soldered or sealed joints. Provide expansion-type slip joint at center of runs.
 - 1. Furnish gutter supports spaced at 36" on center constructed of same metal as gutters.
- B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage thick base metal, shop pre-coated with PVDF (Polyvinylidene Fluoride) coating.
- C. Finish: The exposed finish on all exposed metals and similar items shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning,
 - a. Colors: As selected by Architect after Bid Date, from manufacturer's standard colors including white.

2.3 DOWNSPOUTS

- A. Downspouts: Form downspouts in sections approximately 10 feet long (**no corrugated sections**), complete with elbows and offsets. Join sections with not less than 1-1/2" telescoping joints. Provide fasteners, designed to securely hold downspouts not less than 1" away from walls; locate fasteners at top and bottom and equally spaced at approximately 5 feet on center in between.
- B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage thick base metal, shop pre-coated with PVDF (Polyvinylidene Fluoride) coating.
- C. Finish: The exposed finish on all exposed metals and similar items shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning,
 - a. Colors: As selected by Architect after Bid Date, from manufacturer's standard colors including white.

2.4 METAL SOFFIT SYSTEM – ALUMINUM SOFFIT

- A. Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Ply Gem/Mastic Aluminum Soffit (Basis of Design)
 - 2. Alside Aluminum Soffits
 - 3. Kaycan Aluminum
 - 4. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- B. Materials:

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1. Perforated Aluminum Soffit for ventilation
 - a. Envoy V-Groove by PlyGem/Mastic
 - b. 15 sq. in/Lin. ft..
 - c. Alumalure 2000 finish
 - d. .019" thick
 - e. 12" exposure or as indicated on drawings.

2.5 MISCELLANEOUS MATERIALS & ACCESSORIES

- A. Solder:
 1. For use with steel or copper, provide 50 - 50 tin/lead solder (ASTM B 32), with rosin flux.
 2. For use with stainless steel: Provide 60 - 40 tin/lead solder (ASTM B 32), with acid-chloride type flux, except use rosin flux over tinned surfaces.
- B. Fasteners: Same metal as flashing/sheet metal or, other noncorrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.
- C. Bituminous Coating: FS TT-C-494 or SSPC - Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.
- D. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, non- drying, nonmigrating sealant.
- E. Epoxy Seam Sealer: 2-part noncrossive metal seam cementing compound, recommended by metal manufacturer for exterior/interior non-moving joints including riveted joints.
- F. Adhesives: Type recommended by flashing sheet manufacturer for waterproof/ weather-resistant seaming and adhesive application of flashing sheet.
- G. Paper Slip Sheet: 5-lb. rosin-sized building paper.
- H. Polyethylene Underlayment: 6-mil carbonated polyethylene film; FS L-P-512.
- I. Reglets: Metal or plastic units of type and profile indicated, compatible with flashing indicated, noncrossive.
- J. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, noncrossive, size and gage required for performance.
- K. Roofing Cement: Must be compatible with materials with which it comes in contact.
- L. Provide precast concrete splashblock sloped away from building, approximately 12-inches wide x 24-inches long x 2-inches thick x 3-inches high, with 3-raised edges and one "open" end turned toward building – at locations where downspouts would otherwise drain on grade or paving.
 1. Provide 1-preformed metal pan with corrugated bottom and properly hemmed edges (minimum 12" x 24") at each downspout which drains onto a roof below.

2.9 FABRICATED UNITS

- A. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.
- B. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.

- C. Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 2" deep, filled with mastic sealant (concealed within joints).
- D. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.
- E. Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual".
 - 1. Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.
- B. Underlayment: Where aluminum is to be installed directly on cementitious or wood substrates, install a slip sheet of red rosin paper and a course of polyethylene underlayment.
- C. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.
- D. Install reglets to receive counter-flashing in manner and by methods indicated. Where shown in concrete, furnish reglets to trades of concrete work for installation as work of Division-3 sections. Where shown in masonry, furnish reglets to trades of masonry work, for installation as work of Division-4 sections.
 - 1. Install counter-flashing in reglets, either by snap-in seal arrangement, or by wedging in place for anchorage and filling reglet with mastic or elastomeric sealant, as indicated and depending on degree of sealant exposure.

3.2 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.
- B. Protection: Installer shall advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion.

END OF SECTION

SECTION 07900 - JOINT SEALERS

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. The extent of each form and type of joint sealer is indicated on drawings and by provisions of this section.
- B. The applications for joint sealers as work of this section include the following:
 - 1. Joints (Interior).
 - 2. Joints (Exterior).
 - 3. Flashing Joints.
 - 4. Interior wall/ceiling joints.
- C. General Performance: Except as otherwise indicated, joint sealers are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application. Failures of installed sealers to comply with this requirement will be recognized as failures of materials and workmanship.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications, handling/installation/curing instructions, and performance tested data sheets for each elastomeric product required.

1.4 JOB CONDITIONS

- A. Weather Conditions: Do not proceed with installation of liquid sealants under unfavorable weather conditions. Install elastomeric sealants when temperature by manufacturer for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. General: Manufacturers listed in this article include those known to produce the indicated category of prime joint sealant material, either as a nominally pure generic product or as an equivalent-performance modification thereof or proprietary product.
- B. Manufacturers: The following manufacturer's products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Acrylic Emulsion Latex Sealants:
 - a. Bostik.
 - b. Pecora Corp.
 - c. Sonneborn Building Products.
 - d. Tremco, Inc.
 - 2. Polyurethane Sealants:
 - a. Bostik.
 - b. Master Builders.
 - c. Pecora Corp.
 - d. Sonneborn Building Products.

- e. Tremco, Inc.
- 3. Butyl Sealants:
 - a. Bostik.
 - b. TEC Incorporated.
 - c. Tremco, Inc.
- 4. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS

- A. NOTE: The use of silicone sealants shall not be used at any exterior conditions.
- B. General Purpose Exterior Sealant: Polyurethane; ASTM C 920, Grade NS, Class 25, Uses M, G, and A; single component. (Silicone sealant shall not be used at exterior conditions).
 - 1. Color: Standard colors matching finished surfaces.
 - 2. Applications: Use for:
 - a. Control, expansion, and soft joints in masonry, stone or concrete.
 - b. Joints between concrete and other materials.
 - c. Joints between metal frames and other materials.
 - d. Other exterior joints for which no other sealant is indicated.
- C. Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.
 - 1. Applications: Use for:
 - a. Concealed sealant bead in sheet metal work.
- D. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C 834, single component, paintable.
 - 1. Color: Standard colors matching finished surfaces.
 - 2. Applications: Use for:
 - a. Interior wall and ceiling control joints.
 - b. Joints between door and window frames and wall surfaces.
 - c. Other interior joints for which no other type of sealant is indicated.
- E. Acoustical Sealant: Butyl or acrylic sealant; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, nonskinning.
 - 1. Applications: Use for concealed locations only:
 - a. Sealant bead between top stud runner and structure and between bottom stud track and floor or wall.
- F. Paving Joint Sealant: Polyurethane, self-leveling; ASTM C 920, Class 25, Uses T, M and A; single component.
 - 1. Color: Standard color matching finished surfaces.
 - 2. Applications: Use for:
 - a. Joints in sidewalks and paving, either vehicular or pedestrian.
 - b. Isolation joints and control joints in slabs on grade.
- G. Bituminous and Fiber Joint Filler (BtmF-JF) provide resilient and non-extruding type premolded bituminous-impregnated fiberboard units complying with ASTM D 1751; FS HH-F-341, Type I; or AASHTO M213.

H. Miscellaneous Materials:

1. Joint Primer/Sealer: Provide type of joint primer/sealer recommended by sealant manufacturer for joint surfaces to be primed or sealed.
2. Bond Breaker Tape (BB-Tp): Provide polyethylene tape or other plastic tape as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape where applicable.
3. Sealant Backer Rod (S-BR): provide compressible rod stock of polyethylene foam, polyurethane foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other recommended by sealant manufacturer for back-up of and compatibility with sealant. Where used with hot-applied sealant, provide heat-resistant type which will not be deteriorated by sealant application temperature as indicated.
 - a. Rod Size to Joint Width: Size of all backer rod width shall be 2 times the width of joint/gap to be sealed.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Installer must examine substrate, (joint surfaces) and conditions under which joint sealer work is to be performed and must notify Prime Contractor of unsatisfactory conditions.

3.2 JOINT PREPARATION

- A. Clean joint surfaces immediately before installation of gaskets, sealants or caulking compounds. Remove dirt, insecure coatings, moisture and other substrate which could interfere with seal of gasket or bond of sealant or caulking compound. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer. Roughen vitreous and glazed joint surfaces as recommended by sealant manufacturer.
- B. Prime or seal joint surfaces where indicated, and where recommended by sealant manufacturer. Confine primer/sealer to areas of sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION

- A. Comply with manufacturer's printed instructions except where more stringent requirements are shown on specified, and except where manufacturer's technical representative directs otherwise.
- B. Set joint filler units at depth or position in joint as indicated to coordinate with other work, including installation of bond breakers, backer rods and sealant. Do not leave voids or gaps between ends of joint filler units.
- C. Install sealant backer rod for liquid-applied sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for application indicated.
- D. Install bond breaker tape where indicated and where required by manufacturer's recommendations to ensure that liquid-applied sealants will perform as intended.
- E. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.
- F. Install sealant to depths as shown or, if not shown, as recommended by sealant manufacturer but within the following general limitations, measured at center (thin) section of beads;
- G. For normal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.

- H. Spillage: Do not allow sealants or compounds to overflow from confines of joints, or to spill onto adjoining work, or to migrate into voids of exposed finishes. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.
- I. Recess exposed edges of gaskets and exposed joint fillers slightly behind adjoining surfaces, unless otherwise shown, so that compressed units will not protrude from joints.
- J. Bond ends of gaskets together with adhesive of "weld" by other means as recommended by manufacturer to ensure continuous watertight and airtight performance. Miter-cut and bond ends at corners unless molded corner units are provided.

3.4 CURE AND PROTECTION

- A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Advise Prime Contractor of procedures required for cure and protection of joint sealers during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of substantial completion. Cure and protect sealants in manner which will minimize increases in modulus of elasticity and other accelerated aging effects. Replace or restore sealants which are damaged or deteriorated during construction period.

END OF SECTION

SECTION 08001 –ALUMINUM STOREFRONT (IMPACT AND WIND RESISTANT 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. Extent of exterior aluminum storefronts is indicated on drawings and schedules.
- B. Types of exterior aluminum storefronts required include the following:
 - 1. Exterior Storefront Window Type Framing System, Glass and Glazing.
 - 2. Exterior Aluminum Doors.

1.3 REFERENCES

- A. AAMA - American Architectural Manufacturers Association
 - 1. AAMA/NWWDA 101/I.S.2-97 "Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors"
 - 2. AAMA 502-02 "Voluntary Specification for Field Testing of Windows and Sliding Glass Doors"
 - 3. AAMA 611-98 "Voluntary Specification for Anodized Architectural Aluminum"
 - 4. AAMA 800-92 "Voluntary Specifications and Test Methods for Sealants"
 - 5. AAMA 2603-02 "Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels"
 - 6. AAMA 2604-02 "Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels"
 - 7. AAMA 2605-02 "Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels"
 - 8. AAMA CW-10-97 "Care and Handling of Architectural Aluminum from Shop to Site"
 - 9. AAMA 101.1 Performance Class AW
 - 10. AAMA 501.7-11 Standard test method and performance specifications of a side-hinged exterior door system
- B. ASTM - American Society for Testing and Materials
 - 1. ASTM E 283-99 "Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors" 07-021 08520-2 ALUMINUM WINDOWS (361)
 - 2. ASTM E 330-97 "Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference"
 - 3. ASTM E 331-00 "Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference"
 - 4. ASTM E 1886-05 "Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials"
- C. ICC – International Construction Codes
 - 1. ICC-500 2014 Tornado and Hurricane Impact and Winds
- D. FEMA P-361 - 2015 - Design And Construction Guidance for Community Shelters: March 2015 Version

1.4 PERFORMANCE REQUIREMENTS

Site Improvements and Interior Alterations to
Fairhope High School for the
Baldwin County Schools
Bay Minette, Alabama

ALUMINUM STOREFRONT (IMPACT & WIND
RESISTANT SYSTEMS)
08001-1

A. Conformance to:

1. FEMA P-361, 2015, 'Standard For The Design And Constructions Of Storm Shelters', (Hurricane And Tornado Shelters)
2. ICC 500-2014, 'Standard For The Design Of Storm Shelters'
3. AAMA 101.1, 'North American Fenestration Standard For Windows, Doors, And Skylights' (Performance Grade AW-100, *Size Tested 48.0" x 100.0")
4. AAMA 506-08, 'Voluntary Specifications for Impact And Cycle Testing Of Fenestration Products'
5. ASTM E283, 'Test Method For Determining The Rate Of Air Leakage Through Exterior Windows, Curtain Walls, And Doors Under Specified Pressure Differences Across The Specimen'
6. ASTM E330, 'Test Method For The Structural Performance Through Exterior Windows, Curtain Walls, And Doors By Uniform Static Air Pressure Difference'
7. ASTM E331, 'Test Method For Water Penetration Of Exterior Windows, Curtain Walls, And Doors
By Uniform Static Air Pressure Difference'
8. ASTM E1886, 'Standard Test Method For Performance Of Exterior Windows, Curtain Walls, Doors And Impact Protective Systems Impacted By Missile(s) and Exposed To Cyclic Pressure Differentials'
9. ASTM E1996, 'Standard Test Method For Performance Of Exterior Windows, Curtain Walls, Doors And Impact Protective Systems Impacted By Windborne Debris In Hurricanes'
10. AAMA 101 (modified).

B. Structural properties:

1. Design loads Positive (inward) design pressure of 45 psf Negative (outward) design pressure of 45 psf
2. Deflection limitations:
 - a. The deflection of any door member in a direction normal to the plane of the wall when subjected to the specified design loads shall not exceed 1/175 of its clear span or 3/4" whichever is less.
 - b. For cantilevers, the span shall be taken as two times the distance between anchor centerline and end of cantilever.
 - c. The deflection shall not exceed 50% of the nominal joint width at sealant joints occurring between door members and relatively stiff building elements, or less if required by sealant manufacturer.
 - d. Upon reversal of load direction at magnitudes up to and including 1.5 times design pressures, slippage at fastened and/or clamped connections, shall not exceed 1/8".
 - e. Glass deflection at full design load shall not exceed 1/100 of its span, or 3/4" whichever is less.
 - f. Metal panel deflection shall not exceed 1/90 of its span or 3/4" whichever is less. The span shall be taken as the lesser of the distances between the horizontal or vertical support members.
3. Structural design criteria and testing requirements.
 - a. The work shall be designed to withstand the design loads and pressures specified herein. Compliance shall be demonstrated by calculations performed in accordance with accepted engineering practice.

- b. The work shall be designed to conform to ASTM E 330. Inward and outward acting test pressures shall be equal to 1.5 times the inward and outward acting design pressures to demonstrate a safety factor of 1.5 design pressures. Satisfactory performance at these loads shall mean no glass breakage, no permanent damage to fasteners or anchors, hardware, parts or actuating mechanisms; no malfunction of door; no permanent deformation of main door members in excess of 0.2% of their clear span.
- C. Provision for thermal movement:
 - 1. The work shall be designed to provide for such expansion and contraction of component materials as will be caused by surface temperatures ranging from 20 degrees F to a high temperature of 180 degrees F.
 - 2. The expansion and contraction caused by this temperature differential shall not cause buckling, undue stress on glass, failure of joint seals, undue stress on structural elements, demanding loads on fasteners, reduction of performance, or other detrimental effects.

1.5 SUBMITTALS

- A. Shop drawings: Window location chart; typical window elevations; details of assemblies and glazing details for field-glazed units.
- B. Product data: Manufacturer's specifications and test reports from an AAMA accredited laboratory.
- C. Samples: Each specified finish for aluminum; other samples as requested.

1.6 QUALITY ASSURANCE

- A. Wind Design Data:
 - 1. Refer to Structural Drawings for design data.
 - 2. Design pressure: Refer to Structural Drawings.
 - 3. Impact Resistance: Small and Large Missile per IBC 2009.
 - 4. All storm shelter windows will require signage from the GC on how to clean and maintain windows per the manufacture's instructions.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Handle and protect windows and accessories in accordance with AAMA CW-10-97 until project completion.

1.8 WARRANTY

- A. Windows: Warrant for one year against defects in material or workmanship under normal use.
- B. Organic finish conforming to AAMA 2605-02: warrant for ten years against chipping, peeling, cracking, chalking, or fading.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Framing – TH600 Architectural Aluminum Framing System by Insulgard Security Products
 - 2. Doors – TH350 FEMA Compliant Door System by Insulgard Security Products
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS- GENERAL

- A. Aluminum extrusions: produced from commercial quality 6061-T6 alloy; free from defects impairing strength and durability.

B. FRAMING SYSTEM DESCRIPTION

1. 6" Framing System: Head, Jamb, Sill, Mullion and Intermediate Horizontal Members: 2 1/2" x 6"
2. Finish: Anodized Aluminum - Color as selected by Architect from manufactures standards.
3. Frames: All framing shall be totally factory fabricated (field fabrication is not acceptable). All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members. The system shall incorporate a weep design allowing any water penetration or internal condensation to flow through the system and exit to the exterior at the horizontal members.
4. Material: All components will be constructed from extruded aluminum in 6061-T6 alloy / temper, or equal.
5. Glazing Material: Insulating Glass Clad Polycarbonate – TOR-GARD NBR IG.
6. Anchors: All anchorage will be a fully concealed.
7. Gasketing: Interior glazing gaskets shall be closed cellular EPDM and Exterior gaskets will be solid EPDM, both with molded corners.

C. ALUMINUM DOOR SYSTEM DESCRIPTION

1. 2 3/8" Narrow stile door system.
 - a. Stiles: 5" X 2 3/8"
 - b. Top Rail: 2 3/4" X 2 3/8"
 - c. Bottom Rail: 8 1/2" X 2 3/8"
 - d. Muntin: 1 5/8" x 2 3/8"
 - e. Glazing Stops: 1" Face
2. Finish: Factory-applied
3. Doors: All doors shall be totally factory fabricated (field fabrication is not acceptable). All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members. The system shall incorporate a weep design allowing any water penetration or internal condensation to flow through the system and exit to the exterior at the horizontal members.
4. Material: All components will be constructed from extruded aluminum in 6061-T6 alloy / temper, or equal.
5. Glazing Material: Glass Clad Polycarbonate, Laminated Glass, IGU
6. Anchors: All anchorage will be a fully concealed
7. Gasketing: Interior glazing gaskets shall be closed cellular EPDM and Exterior gaskets will be solid EPDM
8. Hardware Required:
 - a. 2 point lock
 - b. Continuous hinge
 - c. Continuous astragal
 - d. Door coordinator

- e. Carry open device
- f. Panic bar
- g. Latch lock

2.3 FABRICATION

- A. Frame and Door assembly: See details on approved shop drawings
- B. Glass Type: Insulgard Security Products, Tor-GardNBR2 (1.272")

2.4 FINISHES

- A. Application: On clean extrusions free from serious surface blemishes; on exposed surfaces visible when installed.
- B. Finish: Anodized Aluminum – Color as selected from manufactures standards.
 - 1. AAMA 607.1
 - 2. Applicator must be fully compliant with all applicable environmental regulations and permits, including wastewater and heavy metal discharge.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Prepare openings to be in tolerance, plumb, level, provide for secure anchoring, and in accordance with approved shop drawings.

3.2 INSTALLATION

- A. Install windows in accordance with manufacturer's recommendations and approved shop drawings.
 - 1. Glazing contractor must be approved by the manufacturer
 - 2. Manufacturer to provide detailed installation instructions.
- B. Provide required support and securely fasten and set windows plumb, square, and level without twist or bow.
- C. Apply sealant per window and sealant manufacturer's recommendations at all specified areas as shown on shop drawings and detailed in installation instructions. Wipe off excess, and leave exposed sealant surfaces clean and smooth.

3.3 ADJUSTING AND CLEANING

- A. Adjust windows and doors as necessary for weather tightness, and leave windows and doors clean and free of construction debris.

3.4 PROTECTION

- A. Protect window, door glazing and frames from damage during subsequent construction activities. Replace damaged materials and building assemblies at no additional cost to the Owner.

END OF SECTION

SECTION 08100 - STEEL DOORS AND FRAMES

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. This Section includes:
 - 1. Steel Doors
 - 2. Steel Frames.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 4 Section "Unit Masonry" for building anchors into and grouting frames in masonry construction.
 - 2. Division 8 Section "Wood Doors" for solid-core wood doors installed in steel frames.
 - 3. Division 8 Section "Finish Hardware" for door hardware and weatherstripping.
 - 4. Division 8 Section "Glazing" for glass in steel doors and sidelights.
 - 5. Division 9 Section "Gypsum Board Assemblies".
 - 6. Division 9 Section "Painting".

1.3 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 each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.
- C. Shop Drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
- D. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.
 - 1. Indicate coordination of glazing frames and stops with glass and glazing requirements.
- E. Samples for initial selection in the form of manufacturer's color charts showing the full range of colors available for factory-finished doors and frames.
- F. Samples for verification of each type of exposed finish required, prepared on Samples not less than 3 by 5 inches (75 by 125 mm) and of same thickness and material indicated for final unit of Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
- G. Oversize Construction Certification: For door assemblies required to be fire rated and exceeding limitations of labeled assemblies, submit certification of a testing agency acceptable to authorities having jurisdiction that each door and frame assembly has been constructed to conform to design, materials, and construction equivalent to requirements for labeled construction.

1.4 QUALITY ASSURANCE

- A. Provide doors and frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.

- B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies tested for fire-test-response characteristics per ASTM E 152, and are labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to authorities having jurisdiction that doors conform to all standard construction requirements of tested and labeled fire-rated door assemblies except for size.
 - 2. Temperature-Rise Rating: Where indicated, provide doors that have a temperature-rise rating of 450 deg F (250 deg C) maximum in 30 minutes of fire exposure.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Inspect doors and frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber. If cardboard wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch (6-mm) spaces between stacked doors to promote air circulation.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Pioneer Industries
 - 2. Rocky Mountain Metals, Inc.
 - 3. Republic Doors & Frames/Allegion
 - 4. Steelcraft - Allegion

2.2 MATERIALS

- A. Hot-Rolled Steel Sheets and Strip: Commercial-quality carbon steel, pickled and oiled, complying with ASTM A 569 (ASTM A 569M).
- B. Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366 (ASTM A 366M), commercial quality, or ASTM A 620 (ASTM A 620M)
- C. Galvannealed Steel Sheets: Galvannealed Steel Sheet: ASTM A 653/ A 653M, commercial quality, hot dipped. Coating Thickness: A60 coating.
- D. Supports and Anchors: Fabricated from not less than 0.0478-inch- (1.2-mm-) thick steel sheet; 0.0516-inch- (1.3-mm-) thick galvanized steel where used with galvanized steel frames.
- E. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize complying with ASTM A 153, Class C or D as applicable.

2.3 DOORS

- A. Steel Doors: Provide 1-3/4-inch- (44-mm-) thick doors of materials and ANSI/SDI 100 grades and models specified below, or as indicated on Drawings or schedules:
 - 1. Interior Doors: Grade 2, heavy-duty, Model 1, visible edge seam design, 18 gauge /

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minimum 0.0478-inch thick cold-rolled steel sheet faces.

2. Exterior Doors: Grade 3, heavy-duty, Model 1, visible edge seam design, 16 gauge / minimum 0.0635-inch thick A60 galvanized steel sheet faces.
- B. Door Louvers: Provide louvers according to SDI 111C for interior doors where indicated, with blades or baffles formed of 0.0239-inch- (0.6-mm-) thick cold-rolled steel sheet set into minimum 0.0359-inch- (0.9-mm-) thick steel frame.
 1. Sight-Proof Louvers: Stationary louvers constructed with inverted V- shaped or Y-shaped blades.
- C. Low Profile Lite Kits: All lite kits must be minimum 18 ga. cold rolled steel, mitered and welded corners, welded reinforcing clips at corners, counter-sunk mounting screw- holes.

2.4 FRAMES

- A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, according to ANSI/SDI 100, and of types and styles as shown on Drawings and schedules.
- B. Conceal fastenings, unless otherwise indicated. Fabricate frames as follows:
 1. Fabricate frames with mitered or coped and face welded corners.
 2. Interior Frames: 16 gage cold rolled steel
 3. Exterior Frames: 14 gage A60 galvanized steel.
- C. Door Silencers: Except on weather stripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.
- D. Plaster Guards: Provide minimum 0.0179-inch- (0.45-mm-) thick steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.
- E. Grout: When required in masonry construction, as specified in Division 4 Section "Unit Masonry."

2.5 FABRICATION

- A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.
 1. Internal Construction: One of the following manufacturer's standard core materials according to SDI standards:
 - a. Interior Doors: 3/4" Cell Honeycomb
 - b. Exterior Doors: Insulated Polystyrene
 2. Clearances:
 - a. Not more than 1/8 inch (3.2 mm) at jambs and heads, except not more than 1/4 inch (6.4 mm) between non-fire-rated pairs of doors.
 - b. Not more than 3/4 inch (19 mm) at bottom.
 - c. Fire Doors: Provide clearances according to NFPA 80.
 3. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- B. Galvanized Steel Doors, Panels, and Frames: For the following locations, fabricate doors, panels, and frames from galvanized steel sheet according to SDI 112.
 1. At exterior locations.
 2. Where indicated.

- C. Close top and bottom edges of doors flush as an integral part of door construction or by addition of minimum 0.0635-inch- (1.6-mm-) thick galvanized steel channels, with channel webs placed even with top and bottom edges. Seal joints in top edges of doors against water penetration.
- D. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- E. Thermal-Rated (Insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal-insulating door and frame assemblies and tested according to ASTM C 236 or ASTM C 976 on fully operable door assemblies.
 - 1. Unless otherwise indicated, provide thermal-rated assemblies with U- value rating of 0.41 Btu/sq. ft. x h x deg F (2.33 W/sq. m x K) or better
- F. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier.
- G. Comply with applicable requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.
 - 1. For concealed overhead door closers, provide space, cutouts, reinforcing, and provisions for fastening in top rail of doors or head of frames, as applicable.
- H. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- I. Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
- J. Glazing Stops: Minimum 0.0359-inch- (0.9-mm-) thick steel or 0.040-inch- (1-mm-) thick aluminum.
 - 1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
 - 2. Provide screw-applied, removable, glazing beads on inside of glass, louvers, and other panels in doors.

2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual" for recommendations relative to applying and designating finishes.
- B. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for steel sheet finishes. Apply primers and organic finishes to doors and frames after fabrication.

2.7 GALVANIZED STEEL SHEET FINISHES

- A. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC- Paint 20.
- B. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply air-dried primer specified below immediately after cleaning and pretreatment.
 - 1. Shop Primer: Zinc-dust, zinc-oxide primer paint complying with performance requirements of FS TT-P-641, Type II.

2.8 STEEL SHEET FINISHES

- A. Surface Preparation: Solvent-clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel to comply with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).
- B. Pretreatment: Immediately after surface preparation, apply a conversion coating of type suited to organic coating applied over it.

- C. Factory Priming for Field-Painted Finish: Apply shop primer that complies with ANSI A224.1 acceptance criteria, is compatible with finish paint systems indicated, and has capability to provide a sound foundation for field-applied topcoats. Apply primer immediately after surface preparation and pretreatment.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.
- B. Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
1. Except for frames located in existing concrete, masonry, or gypsum board assembly construction, place frames before constructing enclosing walls and ceilings.
 2. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.
 3. At existing concrete or masonry construction, install at least 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.
 4. Install fire-rated frames according to NFPA 80.
- A. Door Installation: Fit hollow-metal doors accurately in frames, within clearances specified in ANSI/SDI 100.
1. Fire-Rated Doors: Install with clearances specified in NFPA 80.
 2. Smoke-Control Doors: Comply with NFPA 105.

3.2 ADJUSTING AND CLEANING

- A. Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
- B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION

SECTION 08211 - WOOD DOORS

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. This Section includes the following:
 - 1. Solid core doors with wood veneer faces.
 - 2. Factory finishing of flush wood doors.

1.3 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 each type of door, including details of core and edge construction, trim for openings and louvers, and factory-finishing specifications.
- C. Shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for veneer matching and factory finishing and other pertinent data.
 - 1. For factory-machined doors, indicate dimensions and locations of cutouts for locksets and other cutouts adjacent to light and louver openings.
- D. Samples for initial selection in the form of color charts consisting of actual materials in small sections for the following:
 - 1. Faces of factory-finished doors with transparent finish. Show the full range of colors available for stained finishes.
 - 2. Faces of factory-finished doors with opaque finish. Show the full range of colors available.
- E. Samples for verification in the form and size indicated below:
 - 1. Corner sections of doors approximately 12 inches (300 mm) square with door faces and edgings representing the typical range of color and grain for each species of veneer and solid lumber required. Finish sample with same materials proposed for factory-finished doors.

1.4 QUALITY ASSURANCE

- A. Quality Standard: Comply with the following standard:
 - 1. NWWDA Quality Standard: I.S.1-A, "Architectural Wood Flush Doors," of the National Wood Window and Door Association.
 - 2. AWI Quality Standard: "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute for grade of door, core, construction, finish, and other requirements.
- B. Fire-Rated Wood Doors: Provide wood doors that comply with NFPA 80; are identical in materials and construction to units tested in door and frame assemblies per ASTM E 152; and are labeled and listed by UL, Warnock Hersey, or another testing and inspection agency acceptable to authorities having jurisdiction.
 - 1. Oversized Fire-Rated Wood Doors: For door assemblies exceeding sizes of tested assemblies, provide manufacturer's certificate stating that doors conform to all standard construction requirements of tested and labeled fire-door assemblies except for size.
 - 2. Temperature Rise Rating: At stairwell enclosures, provide doors that have a temperature rise rating of 450 deg F (250 deg C) maximum in 30 minutes of fire exposure.

3. Temperature Rise Rating: At stairwell enclosures, provide doors that have a temperature rise rating of 250 deg F (139 deg C) maximum in 30 minutes of fire exposure.

- C. Single-Source Responsibility: Obtain doors from one source and by a single manufacturer.

1.5 DELIVERY, STORAGE & HANDLING

- A. Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Comply with requirements of referenced standard and manufacturer's instructions.
 1. Comply with Technical Bulletin 420-R for delivery, storage, and handling of doors.
- B. Identify each door with individual opening numbers as designated on shop drawings, using temporary, removable, or concealed markings.

1.6 PROJECT CONDITIONS

- A. Conditioning: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.7 WARRANTY

- A. General Warranty: Door manufacturer's warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form signed by manufacturer, Installer, and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup, or twist) more than 1/4 inch (6.35 mm) in a 42-by-84-inch (1067-by-2134-mm) section or that show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 75-mm) span, or do not conform to tolerance limitations of referenced quality standards.
 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors where defect was not apparent prior to hanging.
 2. Warranty shall be in effect during the following period of time after date of Substantial Completion.
 - a. Solid Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering doors that may be incorporated in the Work (No other Manufacturer to be used unless prior approved by addenda)
- B. Manufacturer: Subject to compliance with requirements, provide doors by one of the following:
 1. Oshkosh Door Company; 2501 Universal Street, P.O. Box 2468, Oshkosh, WI 54904; Ph.: 920.233.6161; www.oshkoshdoor.com.
 2. VT Industries; 1000 Industrial Park, P.O. Box 490, Holstein, IA 51025; Ph.: 712.368.4381; www.vtindustries.com.
 3. Haley Brothers, Inc.; 6291 Orangethorpe Ave., Buena Park, CA 90620; Ph.: 714.670.2112; www.haleybros.com.

2.2 INTERIOR FLUSH WOOD DOORS

- A. Solid Core Doors for Transparent Finish: Comply with the following requirements:
 1. Faces: Plain Sliced White Birch, Book/Run Matching

2. Grade: Premium "A"
 3. Construction: 5 ply, Hot Pressed
 4. Core: Particleboard Core to meet or exceed ANSI/A208.1 for 1-LD-1 or 1-LD-2 door core
 5. Bonding: Stiles and rails bonded to core, then entire unit abrasive planed before veneering.
 6. Pair Matching: Required at all pairs of doors.
- B. Fire-Rated Solid Core Doors: Comply with the following requirements:
1. Faces and Grade: Provide faces and grade to match non-fire-rated doors in same area of building, unless otherwise indicated.
 2. Construction: Manufacturer's standard core construction as required to provide fire-resistance rating indicated.
 3. Edge Construction: Provide manufacturer's standard laminated-edge construction for improved screw-holding capability and split resistance compatible hardwood
 4. Pairs: Furnish formed-steel edges and astragals for pairs of fire-rated doors, unless otherwise indicated.
 5. Pairs: Provide fire-rated pairs with fire-retardant stiles that are labeled and listed for kinds of applications indicated without formed-steel edges and astragals.

2.3 FABRICATION

- A. Fabricate flush wood doors to comply with following requirements:
1. In sizes indicated for job-site fitting.
 2. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels:
 - a. Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements of NFPA 80 for fire-resistance-rated doors.
 3. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame shop drawings, DHI A115-W series standards, and hardware templates.
 - a. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory machining.
 - b. Metal Astragals: Pre-machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.
- B. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.
1. Light Openings: Trim openings with moldings of material and profile indicated.
 2. Louvers: Factory install louvers in prepared openings.

2.4 SHOP PRIMING

- A. Transparent Finish: Shop-seal faces and edges of doors for transparent finish with stain (if required), other required pretreatments, and first coat of finish as specified.

2.5 FACTORY FINISHING

- A. General: Comply with referenced quality standard's requirements for factory finishing.
- B. Finish wood doors at factory.
- C. Transparent Finish: Comply with requirements indicated for grade, finish system, staining effect, and sheen.
1. Grade: Premium.

2. Finish: AWI System TR-6 or better in Factory standard color as directed by the Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine installed door frames prior to hanging door:
 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
 2. Reject doors with defects.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation see Division 8 Section "Door Hardware."
- B. Manufacturer's Instructions: Install wood doors to comply with manufacturer's instructions and referenced quality standard and as indicated.
 1. Install fire-rated doors in corresponding fire-rated frames according to requirements of NFPA 80.
- C. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
 1. Fitting Clearances for Non-Fire-Rated Doors: Provide 1/8 inch (3.2 mm) at jambs and heads, 1/16 inch (1.6 mm) per leaf at meeting stiles for pairs of doors, and 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4-inch (6.4-mm) clearance from bottom of door to top of threshold.
 2. Fitting Clearances for Fire-Rated Doors: Comply with NFPA 80.
 3. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
 4. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) on lock edge; trim stiles and rails only to extent permitted by labeling agency.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- E. Factory-Finished Doors: Restore finish after installation, if fitting or machining is required at the job site.

3.3 ADJUSTING AND PROTECTION

- A. Operation: Re-hang or replace doors that do not swing or operate freely.
- B. Finished Doors: Refinish or replace doors damaged during installation.
- C. Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at the time of Substantial Completion.

END OF SECTION

SECTION 08220 - FRP DOORS

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. The extent of each type of door is shown on the drawings and schedules. The following types of doors are required:
 - 1. Fiberglass Reinforced Plastic (FRP) Doors.

1.3 QUALITY ASSURANCE

- A. Manufacturer's Certification: Manufacturer is to have a minimum of 25 years experience in the production of pre-hardwood and pre-assembled door systems, using the type of materials specified for this project.
- B. Installer's Qualifications: For the installation of the entrance systems, use only mechanics who are thoroughly trained and experienced in the skills required and who are completely familiar with the manufacturer's recommended methods of installation plus the requirements of this work.

1.4 WARRANTY

- A. Warranty all fiberglass doors for a period of 10 years against failure due to corrosion. Additionally, warranty all fiberglass doors on materials and workmanship for a period of 10 years, including warp, separation or delaminating and expansion of the core.

1.5 TEST REPORTS AND PERFORMANCE REQUIREMENTS FOR ALUMINUM HYBRID FRP NARROW STILE DOORS – HURRICANE RATED

- A. Entrance systems must comply with requirements for system performance characteristics as determined by the testing methods that follow:
 - 1. Two copies of current test reports covering the test procedures as listed are to be included with the submittals.
- B. Complete System Requirements Test: Complete system units that include door, frame and hardware are to meet the following criteria:
 - 1. FBC Protocol for TAS 201; TAS 202; TAS 203 – Pass, and the following additional minimum criteria in conjunction with the qualifications as outlined by previously referenced standards:
 - a. Thermal Transmittance Tests:
 - 1) U-factors expressed in Btu/ hr-ft (2)-F - AAMA 1503-98 - 0.58
 - 2) R-value expressed in hr-ft (2)-F/Btu - ASTM 1503-98 - 1.73
 - b. Structural Performance Tests:
 - 1) Air Infiltration –
ASTM E283 @ 1.56 psf (25 mph) - 0.41 cfm/ft (2)
ASTM E283 @ 6.24 psf (50 mph) – 1.06 cfm/ft (2)
 - 2) Water Penetration –
ASTM E331 - 15 Min Cycle - NO ENTRY
 - 3) Uniform Static Load for single door- ASTM E330 - (+) - 195.0
 - c. Structural Integrity Tests:

- 1) Exit Bar Pull Off Test - 1300 lbs. minimum load resistance before exit bar disengages from door.
- 2) Closer Pull Off - 1638 lbs. minimum load resistance before closer disengages from door.
- d. Windborne Debris Resistance Tests:
 - 1) Large Missile Impact Test - SFBC PA 201 - 94 – PASSED
 - 2) Cyclic Wind Pressure Test - SFBC PA 203 - 94 - 65PSF
 - 3) Forced Entry Test - SFBC 3603.2 - 300 lbs. – PASSED
- e. Indoor Air Quality Test: ASTM D 6670-01: GREENGUARD Environmental Institute Certified including GREENGUARD for Children and Schools Certification.
- C. Face Sheet Requirements Test: FRP material and FRP face sheets with core material are to meet the following criteria:
 1. Center Door Section (face sheet/core/face sheet) Gardner Impact Test – Nominal Value, ASTM D 3029 120 in-lb.
 2. FRP Material (MR85)
 - a. Flexural Strength Test – ASTM D790 - 22,600 psi (inward) 24,400 psi(outward)
 - b. Izod Impact Strength Test – ASTM D256 - 15.36 ft-lb./in thickness
 - c. Barcol Hardness – ASTM D2583 – 50

1.6 SUBMITTALS

- A. Product Technical Data Including:
 1. Acknowledgment that products submitted meet requirements of standards referenced.
 2. Manufacturer shall provide certificate of compliance with current local and federal regulations as it applies to the manufacturing process.
 3. Manufacturer's installation instructions.
 4. Schedule of doors indicating the specific reference numbers used on the owner's project documents, noting door type, frame type, size, handing and applicable hardware.
 5. Details of core and edge construction, including factory construction specifications.
 6. Certification of manufacturer's qualifications.
- B. Submittal Drawings for approval shall be submitted prior to manufacture and shall include the following Information and formatting:
 1. Summary door schedule indicating the specific reference numbers as used on owner's drawings, with columns noting door type, frame type, size, handing, accessories and hardware.
 2. A drawing depicting front and rear door elevations showing hardware with bill of material for each door.
 3. Drawing showing dimensional location of each hardware item and size of each door.
 4. Individual part drawing and specifications for each hardware item and FRP part or product.
 5. Construction and mounting detail for each frame type.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Each door shall be delivered individually crated for protection from damage in cardboard containers, clearly marked with project information, door location, specific reference number as shown on drawings, and shipping information. Each crate shall contain all fasteners necessary for installation as well as complete installation instructions.

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1. Doors shall be stored in the original container on edge, out of inclement weather for protection against the elements.
2. Handle doors pursuant to the manufacturer's recommendations as posted on outside of crate.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 1. Special-Lite - SL-17 HR Series, FRP/Aluminum Hybrid
- B. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.
- C. NOTE: Manufacturer must meet all technical requirements listed herein.
- D. Door Systems Classifications: Door systems for this project are based on criteria as cited for Systems meeting FBC Protocols TAS 201, 202, 203. Doors were tested as a unit and as such, to meet specified criteria all specifications regarding frame and door size must be met and testing documentation outlining the unit specifics as tested must be provided.

2.2 MATERIALS

- A. Aluminum Members:
 1. Doors, frames, miscellaneous components and entrance systems accessories are to be from the same manufacturer. Splitting the source for these items will not be permitted.
 2. Provide alloy and temper as recommended for resistance to corrosion and color control. Aluminum member references are ASTM B 221 for extrusions and ASTM B 209 for sheets.

2.3 ALUMINUM FRAMES

- A. Standard Closed Back Frames shall be of extruded aluminum 6063-T5 alloy and a wall thickness of .125".
 1. Vertical Members: All vertical frame jambs and mullions will be full height of opening.
 2. Sections: Tube sections will be 2" x 6" with joints connected by use of reinforcing clips and machine screws.
 3. Finish to be determined by architect after the bid.
 4. Closed Back Frames shall be SL-260.

2.4 FIBERGLASS NARROW STILE HURRICANE RATED ALUMINUM HYBRID (FRP) DOORS

- A. Structural Main Frame: Doors have an aluminum main frame constructed from extruded aluminum 6063 - T5 alloy. Doors are 1 3/4" thick. Main-frame tube is to be a single extruded unit measuring 1 1/2" x 2 1/2" (O.D.) on Sides; Bottom and top rail with a 6" (O.D.) tube.
- B. Main Frame Stile Wall Thickness:
 1. Side Stiles Minimum 1/8" thick hinge edge wall.
 2. Side Stiles Minimum 1/8" thick face walls.
 3. Bottom Rail Minimum 1/8" thick face walls.
 4. Top Rail Minimum 1/8" thick all walls.
- C. Main Frame Joinery: Assembly for the meeting joints of the Rails and Stiles on the main-frame are to include the following:

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1. Tie rods inserted into top and bottom rails.
 2. Mortise & Tenon with four-point connect fasteners (per joint).
 3. ****WELDED JOINTS WILL NOT BE ACCEPTED****
- D. Face Sheets: Face sheets will be fiberglass reinforced polyester, .120" thick, and have a pebble-like embossed finish. Face sheet color will be selected from manufacturer's standard color chart.
- E. FRP face sheets are MR85 HIGH IMPACT FRP MATERIAL that has been tested by ASTM S5420 Gardner Impact Test with "Mean Failure Energy" rating no lower than 411.84 in-lb. (or equal).
- F. Core Material: Core material will be 5-lb. density polyurethane with a flame spread rating of no more than 25.
1. URETHANE CORE DOORS will require a letter from the manufacturer offering a special guarantee that the FRP face sheets will not delaminate (bubble) for a period of 25 years, AND that the manufacturer will cover ALL replacement costs if delamination does occur.
- G. Edge Trim: Stile Edge Trim is an INTEGRAL part of the main frame and interlocks with the panel. Top and bottom edge trim is removable.
1. Snap on edge trim will not be accepted.
- H. Weather Stripping: Weather stripping package as provided by door manufacturer as tested and passed with unit.
- I. Hardware Reinforcing: Closer reinforcing to be 1/8" minimum aluminum plate or channel. Surface Applied Exit Device reinforcing to be 1/8" aluminum channel.
- J. Narrow Stile Hurricane (FRP) Doors are by one of the following:
1. Basis of Design: Commercial Door Systems F200-HR
 2. Approved Manufacturer: SPECIAL LITE, Hurricane Rated Model SL-17 (must provide proof of test reports to confirm hardware configuration for each set of specified hardware passes TAS protocol 201, 202, 203)
- K. Vision Lites:
1. Vision lite trim moldings will be aluminum extrusion - 6063-T5 alloy and removable from the inside only.
 2. Door Vision Lites will be Factory glazed with hurricane tested glass size
 3. Hurricane Rated Vision Lite not to exceed 22" x 32" inches
 4. Door Vision Lite Kits are by THE DOOR MANUFACTURER ONLY.

2.5 HARDWARE

- A. Hardware locations to be templated as tested for Hurricane approval.
- B. Refer to specification section 08700 for hardware requirements.

PART 3 - EXECUTION

3.1 VERIFICATION

- A. Verification of Conditions:
 1. Verify openings are correctly prepared to receive doors and frames.
 2. Verify openings are correct size and depth in accordance with submittal drawings.
- B. Installer's Examination:

1. Door installer shall examine conditions under which construction activities of this section are to be performed and submit a written report to general contractor if conditions are unacceptable.
2. General Contractor shall submit two copies of the installer's report to the architect within 24 hours of receipt.
3. Installer shall not proceed with installation until all unacceptable conditions have been corrected.

3.2 INSTALLATION

- A. Doors shall be delivered at job site individually crated. Each crate to be clearly marked with the specific opening information for quick and easy identification.
- B. All single doors to be shipped completely assembled in the frame with hardware installed. Double doors to be prehung at the factory to ensure a proper fit and that hardware functions properly, then disassembled for shipping purposes.
- C. Install door opening assemblies in accordance with shop drawings and manufacturer's printed installation instructions, using installation methods and materials specified in installation instructions.
- D. Field alteration of doors or frames to accommodate field conditions is strictly prohibited. Site tolerances: Maintain plumb and level tolerance specified in manufacturer's printed installation instructions.
- E. Fire labeled doors, frames and any associated hardware must be installed by qualified professional installers in strict accordance with manufacturer's instructions and the latest revision of NFPA 80.

3.3 ADJUSTING

- A. Adjust doors in accordance with the door manufacturer's maintenance instructions to swing open and shut without binding and to remain in place at any angle without being moved by gravitational influence.
- B. Adjust door hardware to operate correctly in accordance with hardware manufacturer's maintenance instruction.

3.4 CLEANING

- A. Clean surfaces of door opening assemblies and exposed door hardware in accordance with respective manufacturer's maintenance instructions.

3.5 PROTECTION OF INSTALLED PRODUCTS

- A. Protect door opening assemblies and door hardware from damage by subsequent construction activities until final inspection.

END OF SECTION

SECTION 08330 - COILING DOORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. **Overhead Coiling Service Doors.**

1.2 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Support framing and framed opening.
- B. Section 08700 - Door Hardware: Product Requirements for cylinder core and keys.

1.3 REFERENCES

- A. ANSI/DASMA 108 - American National Standards Institute Standard Method For Testing Sectional Garage Doors And Rolling Doors: Determination Of Structural Performance Under Uniform Static Air Pressure Difference.
- B. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Element.
- C. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- D. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- E. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- F. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- G. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- H. NEMA MG 1 - Motors and Generators.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Overhead coiling service doors:
 - 1. Wind Loads: Design door assembly to withstand wind/suction load of 20 psf (958 Pa) without damage to door or assembly components in conformance with ASTM E 330.
 - 2. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.
- B. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01600.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Details of construction and fabrication.
 - 4. Installation instructions.

- C. Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, and accessories. Include relationship with adjacent construction.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.6 QUALITY ASSURANCE

- A. Furnish each coiling door as a complete unit produced by one manufacturer, including hardware, accessories, mounting and installation components.
- B. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- C. Installer Qualifications: Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.
- D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.
 - 4. Anchorages: Furnish all anchoring devices and provide setting drawings, templates, instructions and directions for installation of anchoring devices. Coordinate delivery with other work to avoid delay.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
- C. Store materials in a dry, warm, ventilated weathertight location.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 COORDINATION

- A. Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

1.10 WARRANTY

- A. Warranty: Manufacturer's limited door and operator system, except the counterbalance spring and finish, to be free from defects in materials and workmanship for 3 years or 20,000 cycles, whichever occurs first.
- B. Warranty: Manufacturer's limited door system warranty for 2 years for all parts and components.
- C. PowderGuard Finish

1. PowderGuard Max: Applied to curtain, guides, bottom bar, headplates: Manufacturer's limited Max Finish warranty for 5 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: info@overheaddoor.com.
- B. Raynor; 1101 East River Road, Dixon, IL 61021-0448; www.raynor.com; PH: 815.285.7144.
- C. Cookson; 1901 South Litchfield Road, Goodyear, AZ 85338; www.cooksondoor.com; PH: 800.294.4358
- D. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 OVERHEAD COILING SERVICE DOORS

- A. Industrial Doors: Overhead Door Corporation, **Model 610 Service Doors**.
 1. Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
 - a. Flat profile type F-265 for doors up to 18 feet 4 inches (5.59 m) wide, fabricated of:
 - i. 22 gauge galvanized steel.
 - b. Flat profile type F-265 for doors between 18 feet 4 inches (5.59 m) and 25 feet 4 inches (7.72 m) wide, fabricated of:
 - i. 20 gauge galvanized steel.
 - c. Flat profile type F-265 for doors between 25 feet 4 inches (7.72 m) and 40 feet (12.19 m) wide, fabricated of:
 - i. 18 gauge galvanized steel.
 2. Slats and Hood Finish:
 - a. Galvanized Steel: Slats and hood galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.
 - i. Powder Coat:
 - 1) PowderGuard Max powder coat, color as selected by Architect.
 - ii. Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
 3. Weatherseals:
 - a. Vinyl bottom seal.
 - b. Guide weatherseal.
 4. Bottom Bar:
 - a. Two galvanized steel angles.
 5. Guides: Three structural steel angles.
 6. Brackets:
 - a. Galvanized steel to support counterbalance, curtain and hood.
 7. Finish; Bottom Bar, Guides, Headplate and Brackets:

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- a. Finish: PowderGuard Max powder color as selected by the Architect.
- 8. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance is adjustable by means of an adjusting tension wheel.
- 9. Hood:
 - a. 24 gauge galvanized steel with intermediate supports as required.
- 10. Electric Motor Operation: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Sensing Edge Protection:
 - i. Electric sensing edge.
 - b. Operator Controls:
 - ii. Push-button and key operated control stations with open, close, and stop buttons.
 - iii. Controls – See Drawings for locations.
 - iv. Controls mounted as indicated on drawings.
 - c. Motor Voltage: 115/230 single phase, 60 Hz.
- 11. Windload Design:
 - a. Standard windload shall be 20 PSF.
- 12. Locking:
 - a. Interior slide bolt lock for electric operation with interlock switch.
 - b. Cylinder lock.
- 13. Wall Mounting Condition:
 - a. As Indicated on drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes, tolerances and conditions are acceptable.
- B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Section 16150. Complete wiring from disconnect to unit components.
- F. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.
- G. Install perimeter trim and closures.
- H. Instruct Owner's personnel in proper operating procedures and maintenance schedule.

3.4 ADJUSTING

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION

SECTION 08380 – TRAFFIC DOORS

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 work of this section.

1.2 DESCRIPTION OF WORK

- A. Extent of traffic doors is shown on drawings.
- B. Provide complete operating assemblies including doors, hardware, frames, operators and installation accessories.

1.3 QUALITY ASSURANCE

- A. Furnish each traffic door as a complete unit produced by one manufacturer, including hardware, accessories, mounting and installation components.
- B. Insert and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry for installation of units. Provide setting drawings, templates, instructions and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, roughing-in diagrams, and installation instructions for each type and size of traffic door and frame. Include operating instructions and maintenance information.
- B. Shop Drawings: Show fabrication and installation details of traffic doors and frames. Include plans, elevations, sections, details and attachments to other Work.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Chase Doors, (Basis of Design) Cincinnati, OH, Model SD 2000.
 - 2. Eliason Doors
 - 3. Carlson Doors.
- B. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 TRAFFIC DOORS AND FRAMES – MATERIALS

- A. Doors shall be constructed of .063" thick tempered aluminum alloy, satin anodized finish on both sides.
- B. Panels shall be manufactured with a formed triangular leading edge and back edge spine.
- C. Stainless steel Chase "E" series adjustable gravity close hardware system with panel mounted hinge body, and stainless steel jamb mounting bracket. Hinge cover is stainless steel.
- D. Bottom hinge assembly shall be 5/8" diameter stainless steel pin with panel mounted saddle bracket and shall include hardware for floor and jamb mount installation.
- E. Window shall be 9" x 14" shatter resistant acrylic, set in black rubber molding. All windows shall be factory installed and sealed. Window shall be centered 60" from the floor.
- F. Aluminum Lower Hinge Guards to be 3" x 9", 5" x 18" high.
- G. Impact Plates shall be 30" galvanized on both sides.

H. Frames: Tubular Steel by door manufacturer

2.3 FABRICATION

- A. General: Provide traffic door assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names or roughness.

2.4 WARRANTY

- A. 2 years from the date of installation.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install special doors complete with necessary hardware and accessories in accordance with final shop drawings, manufacturer's instructions and as specified herein.
- B. All assemblies must be installed plumb, level and properly aligned.
- C. Upon completion of installation, lubricate, test and adjust doors to operate easily, free from warp, twist or distortion.
- D. Coordinate installation of bollards and/or wall stops with architectural drawings.

END OF SECTION

SECTION 08410 - ALUMINUM STOREFRONTS

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. Extent of aluminum entrances and storefronts is indicated on drawings and schedules.
- B. Types of aluminum entrances required include the following:
 - 1. Frames for exterior glazed windows.
- C. Glazing: Refer to "Glazing" section of Division 8 for glazing requirements for aluminum entrances and storefronts specified herein to be factory pre-glazed.

1.3 SYSTEM PERFORMANCES

- A. General: Provide exterior entrance and storefront assemblies that have been designed and fabricated to comply with requirements for system performance characteristics listed below as demonstrated by testing manufacturer's corresponding stock systems according to test methods designated. System shall be of design styles indicated. System components and accessories shall be from the same manufacturer, to the maximum extent possible.
- B. Thermal Movement: Allow for expansion and contraction resulting from ambient temperature range of 120 degree F.
- C. Wind Loading: Provide capacity to withstand loading indicated below, tested per ASTM E 330.
 - 1. Uniform pressure of 20 psf inward and 20 psf outward.
- D. Transmission Characteristics of Fixed Framing: Comply with requirements indicated below for transmission characteristics and test methods.
 - 1. Air and Water Leakages: Air infiltration of not more than 0.06 CFM per sq. ft. of fixed area per ASTM E 283 and no uncontrolled water penetration per ASTM E 331 at pressure differential of 6.24 psf (excluding operable door edges).
 - 2. Condensation Resistance: Not less than 51 CRF per AAMA 1502.7.
 - 3. Thermal Transmittance: U-value of not more than 0.65 Btu/(hr x sf x degree F) per AAMA 1503.1.

1.4 QUALITY ASSURANCE

- A. Drawings: Plans, elevations and details show spacings of members as well as profile and similar dimensional requirements of aluminum entrances and storefront work. Minor deviations will be accepted in order to utilize manufacturer's standard products when, in Architect's sole judgment, such deviations do not materially detract from design concept or intended performances.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, standard details, and installation recommendations for components of aluminum entrances and storefronts required for project, including test reports certifying that products have been tested and comply with performance requirements.
- B. Samples: Submit samples of each type and color of aluminum finish on 12" long sections of extrusions or formed shapes and on 6" square sheets. Where normal color and texture variations are to be expected, include 2 or more units in each set of samples showing limits of such variations.

PART 2 - PRODUCTS

2.1 MANUFACTURERES

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Kawneer North America
 - 2. Tubelite, Inc.
 - 3. Coral Industries, Inc./Coral Architectural Products
 - 4. YKK AP America, Inc.
 - 5. Oldcastle
 - 6. Record
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS AND ACCESSORIES

- A. Aluminum Members: Alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish; ASTM B 221 for extrusion, ASTM B 209 for sheet/plate.
- B. Fasteners: Aluminum, non-magnetic stainless steel, or other materials warranted by manufacturer to be noncorrosive and compatible with aluminum components.
 - 1. Do not use exposed fasteners except where unavoidable for application of hardware. Match finish of adjoining metal.
 - 2. Provide Phillips flat-head machine screws for exposed fasteners.
- C. Concealed Flashing: Dead-soft stainless steel, 26 gauge minimum, or extruded aluminum, 0.062" minimum, of an alloy and type selected by manufacturer for compatibility with other components.
- D. Brackets and Reinforcements: Manufacturer's high-strength aluminum units where feasible; otherwise, non-magnetic stainless steel or hot-dip galvanized steel complying with ASTM A 386.
- E. Concrete/Masonry Inserts: Cast-iron, malleable iron, or hot-dip galvanized steel complying with ASTM A 386.
- F. Bituminous Coatings: Cold-applied asphalt mastic complying with SSPC-PS 12, compounded for 30-mil thickness per coat.
- G. Compression Weatherstripping: Manufacturer's standard replaceable stripping of either molded neoprene gaskets complying with ASTM D 2000 or molded PVC gaskets complying with ASTM D 2287.
- H. Sliding Weatherstripping: Manufacturer's standard replaceable stripping of wool, polypropylene, or nylon woven pile, with nylon fabric or aluminum strip backing, complying with AAMA 701.2.
- I. Glass and Glazing Materials: Provide glass and glazing materials which comply with requirements of "Glass and Glazing" section of these specifications.

2.3 FRAMING

- A. Materials:
 - 1. Storefront type framing system for insulated exterior applications:
 - a. Framing system shall be equal to TriFab Versaglaze 451, by Kawneer.
- B. Support Members: Extruded aluminum alloy 6063-T6 or 6061-T6 complying with ASTM B-221.

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- C. Flashing/Closures: Formed aluminum 5005-H34 alloy, min. thickness .040", complying with ASTM B-209.
- D. Cap System: Manufacturer's standard cap glazing system consisting of rectangular (rafter) and beveled (horizontal) glazing gaps which will secure all sides of each light of glass against negative and positive loads.
- E. Fasteners: A300 stainless steel.
- F. Sealant: Silicone (FS TT-S-0015 43A and TT-S-0023 o.c.)

2.4 FABRICATION

- A. Sizes and Profiles: Required sizes for door and frame units, including profile requirements, are indicated on drawings. Any variable dimensions are indicated, together with maximum and minimum dimensions required to achieve design requirements and coordination with other work.
- B. Prefabrication: To greatest extent possible, complete fabrication, assembly, finishing, hardware application, and other work before shipment to project site. Disassemble components only as necessary for shipment and installation.
 - 1. Preglaze door and frame units to greatest extent possible, in coordination with installation and hardware requirements.
 - 2. Do not drill and tap for surface-mounted hardware items until time of installation at project site.
 - 3. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work in manner which prevents damage to exposed finish surfaces. For hardware, perform these operations prior to application of finishes.
- C. Welding: Comply with AWS recommendations to avoid discoloration; grind exposed welds smooth and restore mechanical finish.
- D. Reinforcing: Install reinforcing as necessary for performance requirements; separate dissimilar metals with bituminous paint or other separator which will prevent corrosion.
- E. Continuity: Maintain accurate relation of planes and angles, with hairline fit of contacting members.
- F. Fasteners: Conceal fasteners wherever possible.
- G. Weatherstripping: For exterior doors, provide compression weatherstripping against fixed stops; at other edges, provide sliding weatherstripping retained in adjustable strip mortised into door edge.
 - 1. Provide EPDM/vinyl blade gasket weatherstripping in bottom door rail, adjustable for contact with threshold.

2.5 STOREFRONT FRAMING SYSTEM

- A. General: Provide inside-outside matched center glazed system with provisions for glass replacement. Shop-fabricate and preassemble frame components where possible.

2.6 FINISHES

- A. Baked Enamel Finish: Premium color selection equal to Kawnear #22 Stock Permafluor Architectural Coating (Hylar 5000 or Kynar 500), factory applied and oven baked for a topcoat thickness of 1.0 - 1.3 mils.
- B. Color to be selected by Architect after Bid Date, from manufacturer's standard colors. Color selections MUST include "White".

PART 3 – EXECUTION

3.1 PREPARATION

- A. Field Measurement: Wherever possible, take field measurements prior to preparation of shop drawings and fabrication, to ensure proper fitting of work.

3.2 INSTALLATION

- A. Comply with manufacturer's instructions and recommendations for installation of aluminum entrances.
- B. Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Anchor securely in place, separating aluminum and other corrodible metal surfaces from sources of corrosion of electrolytic action at points of contact with other materials.
- C. Drill and tap frames and apply surface-mounted hardware items, complying with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.
- D. Set sill members and other members in bed of sealant as indicated, or with joint fillers or gaskets as indicated to provide weathertight construction. Comply with requirements of Division 7 for sealants, fillers, and gaskets.
- E. Refer to "Glass and Glazing" section of Division 8 for installation of glass and spandrel panels indicated to be glazed into framing, and not preglazed by manufacturer.

3.3 ADJUST AND CLEAN

- A. Adjust operating hardware to function properly, without binding, and to prevent tight fit at contact points and weatherstripping.
- B. Clean completed systems, inside and out, promptly after erection and installation of glass and sealants. Remove excess glazing and joint sealants, dirt, and other substances from aluminum surfaces.
- C. Institute protective measures and other precautions required to assure that aluminum entrances and storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.

END OF SECTION

SECTION 08520 - ALUMINUM WINDOWS – SINGLE HUNG

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: Exterior Single Hung Aluminum Windows including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of window units.
- B. Related Sections:
 - 1. 07600 Joint Sealants
 - 2. 08800 Glazing

1.3 DEFINITIONS

- A. Performance class designations according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS):
 - 1. AW: Architectural Window
- B. Performance grade number according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS):
 - 1. Design pressure number in pounds force per square foot used to determine the structural test pressure and water test pressure.
- C. Structural Test Pressure: For uniform load structural test, is equivalent to 150 percent of the design pressure.
- D. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).
- E. Minimum Test Size: Smallest gateway test size permitted for performance class. Products must be tested at minimum test size or at a size larger than minimum test size to comply with requirements for performance class.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide aluminum windows capable of complying with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified, and that are of minimum test size indicated below:
 - 1. Size required by AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) for minimum gateway performance.
 - 2. Test size: 60" x 99".
- B. Structural Performance: Provide aluminum windows capable of withstanding the effects of the following loads, based on testing units representative of those indicated for the Project that pass AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Uniform Load Structural Test:
 - 1. Design Wind Loads: Determine design wind loads applicable to the Project from basic wind speed indicated in miles per hour, according to ASCE 7, Section 6.5, "Method 2-Analytical Procedure," based on mean roof heights above grade indicated on Drawings.
 - a. Basic Wind Speed (MPH): (_____)
 - b. Importance Factor (I, II, III): (_____)
 - c. Exposure Category (A,B,C,D): (_____)
 - 2. Deflection: Design glass framing system to limit lateral deflections of glass edges to less than 1/175 of glass-edge length or 3/4 inch (19 mm), whichever is less, at design pressure

based on testing performed according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Uniform Load Deflection Test or structural computations.

- C. Thermal Movements: Provide aluminum windows, including anchorage, that allow for thermal movements resulting from the following maximum change (____) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
- D. Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, with a CRF not less than: 75 (frame) and 76 (glass).
- E. Temperature Index (I): Provide aluminum windows tested for thermal performance according to CSA-A440 with a Temperature Index not less than:
 - 1. 61 (frame), 75 (glass).
- F. Energy Efficiency:
 - 1. Thermal Transmittance Test (U-Factor): When tested to AAMA specification 1503, AAMA specification 507 or NFRC 100 the thermal transmittance (U-Factor) shall not be more than:
 - a. 1" (25.4mm) insulating glass with exterior 3/16" (4.76 mm) annealed clear glass, aluminum spacer, and interior 3/16" (4.76 mm) annealed clear glass.
 - 1) Provide aluminum windows simulated for thermal performance according to AAMA 507 and NFRC 100 with a thermal transmittance (U-Factor) of 0.26 to 0.53 BTU/hr/sf/°F. (Based on center of glass U-Factor range 0.10 to 0.48) with a 10 lb. Sill.
 - 2) Provide aluminum windows simulated for thermal performance according to AAMA 507 and NFRC 100 with a thermal transmittance (U-Factor) of 0.26 to 0.52 BTU/hr/sf/°F. (Based on center of glass U-Factor range 0.10 to 0.48) with a **15 lb. Sill.**
 - b. 1-1/2" (38.1 mm) insulating glass with exterior 1/8" (3.17 mm) annealed low E glass, aluminum spacer, argon gas, center 1/8" (3.17 mm) low E tempered glass, aluminum spacer, argon gas, and interior 1/8" (3.17 mm) annealed clear glass.
 - 1) Provide aluminum windows simulated for thermal performance according to AAMA 507 and NFRC 100 with a thermal transmittance (U-Factor) of 0.23 to 0.38 BTU/hr/sf/°F. (Based on center of glass U-Factor range 0.10 to 0.32) with a 10 lb. Sill.
 - 2) Provide aluminum windows simulated for thermal performance according to AAMA 507 and NFRC 100 with a thermal transmittance (U-Factor) of 0.23 to 0.38 BTU/hr/sf/°F. (Based on center of glass U-Factor range 0.10 to 0.32) with a **15 lb. Sill.**
- G. Solar Heat-Gain Coefficient (SHGC): Provide aluminum windows with a whole-window SHGC as determined according to NFRC 200 and AAMA 507 procedures.
- H. Air Infiltration: Maximum rate not more than indicated when tested according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Air Infiltration Test.
 - 1. Maximum Rate: 0.3 cfm/sq. ft. (1.5 L/s•m²) of area at an inward test pressure of 6.2 lbf/sq. ft. (300 Pa) in accordance with ASTM E283.
- I. Water Resistance: No water leakage as defined in AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) referenced test methods at a water test pressure equaling that indicated, when tested according to ASTM E547 and ASTM E331.
 - 1. Test Pressure: 20 percent of positive design pressure, but not more than 10 lbf/sq. ft. (478 Pa) with a **10 lb. sill** or 15 lbf/sq. ft. (720 Pa) with a **15 lb. sill.**

- J. Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC): When tested to AAMA Specification 1801 and in accordance with ASTM E1425 and ASTM E90, the STC and OITC Rating shall not be less than:
1. 1-1/2" triple insulating glass made with exterior 1/8" soft coat low E glass, thermoplastic butyl spacer, argon gas, center 1/8" soft coat low E glass thermoplastic butyl spacer, argon gas, and interior 1/8" clear glass: 32 (STC) and 24 (OITC)

1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of aluminum window indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum windows and components required.
- E. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type, class, grade, and size of aluminum window. Test results based on use of downsized test units will not be accepted.
- G. Maintenance Data: For operable sash, operating hardware and finishes to be include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An installer which has had successful experiences with installation of the same or similar units required for this project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- C. Source Limitations: Obtain aluminum windows through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum windows and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements." Do not modify size and dimensional requirements.
1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockup for type(s) of window(s) indicated, in location(s) shown on Drawings.
- F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify aluminum window openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY

- A. Special Project Warranty:
1. Submit written warranty signed by manufacturer, installer and contractor, agreeing to replace aluminum window units which fail in materials or workmanship within 3 years of date of

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acceptance. Failure of materials or workmanship shall include (but not be limited to) excessive leakage or air infiltration, excessive deflections, faulty operation of sash, deterioration of finish or metal in excess of normal weathering, and defects in hardware, weather-stripping and other components of work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product:
 - 1. Kawneer Company Inc.
 - 2. Series AA™5450 Ultra Thermal Single Hung Window – Standard Face
 - 3. 4 5/8" (117.48 mm) frame depth
 - 4. AW-PG65-H.
- B. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by aluminum window manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and sash members.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- E. Sliding-Type Weather Stripping: Provide woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric. Comply with AAMA 701/702.
 - 1. Weather Seals: Provide weather stripping with integral barrier fin or fins of semi-rigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.
- F. Sealant: For sealants required within fabricated windows, provide window manufacturer's standard, permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

2.3 WINDOW

- A. Window Type: Single Hung Window
- B. Performance Requirements: Provide aluminum windows of performance indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS)
 - 1. Performance Class and Grade: AW-PG65-H

2.4 GLAZING

- A. Glass and Glazing Materials: Refer to Division 08 Section "Glazing" for glass units and glazing requirements applicable to glazed aluminum window units.
- B. Glazing System: Glazing method shall be a wet/dry type in accordance with manufacturer's standards. Exterior glazing shall be silicone back bedding sealant. Interior glazing shall be snap-in type glazing beads with an interior gasket in accordance with AAMA 702 or ASTM C864.

2.5 HARDWARE

- A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum windows, and sized to accommodate sash weight and dimensions.
- B. Single Hung Windows: Provide the following operating hardware:
 - 1. Sash Balances: A Class 5 adjustable spiral balance with stainless steel or other corrosion-resistant components. Two per sash.
 - 2. Handle: Continuous, integral, bottom sash lift handle.
 - 3. Sash Lock: White bronze sweep lock and keeper on meeting rails. One or two per sash as required by size. Brushed nickel finish.
 - 4. Include Optional Sash Lock: Spring-loaded, snap-type lock on bottom rail of lower sash.
 - 5. Limit Device: Sash stop limit device; for bottom sash located at jamb; two per sash.

2.6 INSECT SCREENS

- A. General: Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches. Fabricate insect screens to fully integrate with window frame. Locate screens on outside of window and provide for each operable exterior sash.
 - 1. Comply with SMA 1004, "Specifications for Aluminum Tubular Frame Screens for Windows," for minimum standards of appearance, fabrication, attachment of screen fabric, hardware, and accessories unless more stringent requirements are indicated.
- B. Aluminum Insect Screen Frames: Manufacturer's standard aluminum alloy complying with SMA 1004. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners and removable PVC spline.
 - 1. Extruded-Aluminum or Aluminum Tubular Framing Sections and Cross Braces: Not less than 0.050-inch (1.3-mm) wall thickness.
 - 2. Finish: Manufacturer's standard.
- C. Glass-Fiber Mesh Fabric: 18-by-16 mesh/inch (18-by-16 mesh/25.4mm) of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration; in the following color. Comply with ASTM D 3656.
 - 1. Mesh Color: Charcoal or Silver Grey.

2.7 FABRICATION

- A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fit joints; make joints flush, hairline and weatherproof.
 - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 6. Provisions for field replacement of glazing.
 - 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

- B. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- C. Fabricate aluminum windows that are re-glazable without dismantling sash or framing.
- D. Thermally Improved Construction: Fabricate aluminum windows with an integral, concealed, low-conductance thermal barrier; located between exterior materials and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact. Thermal barriers shall be designed in accordance with AAMA TIR A8.
 - 1. Frame thermal barrier shall be polyamide with a minimum of 1" (25.4 mm) separation, installed continuously and mechanically bonded to the aluminum.
 - 2. Sash thermal barrier shall be polyamide with a minimum of 1/2" (12.7 mm) separation, installed continuously and mechanically bonded to the aluminum.
- E. Weather Stripping: Provide full-perimeter weather stripping for each operable sash.
- F. Weep Holes: Provide weep holes and internal passages in window frames to conduct infiltrating water to exterior.
- G. Provide water-shed members as required above lines of natural water penetration.
- H. Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.
- I. Sub frames: Provide sub frames with anchors for window units as shown, of profile and dimensions indicated but not less than 0.093-inch (2.4-mm) thick extruded aluminum. Miter or cope corners, and join with concealed mechanical joint fasteners. Finish to match window units. Provide sub frames capable of withstanding design loads of window units.
- J. Factory-Glazed Fabrication: Glaze aluminum windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 08 Section "Glazing" and with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).
- K. Glazing Stops: Provide snap-on glazing stops coordinated with Division 08 Section "Glazing" and glazing system indicated. Provide glazing stops to match sash.

2.8 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Factory Finishing:
 - 1. Kawneer Permadize™ (50% PVDF), AAMA 2604, Fluoropolymer Coating
 - 2. Color to be selected by architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight window installation.
 - 1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.

2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.
- B. Install aluminum framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- D. Install aluminum framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within sliding door to the exterior.
- E. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.
 1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing Services: Testing and inspecting of installed windows shall take place as follows:
 1. Testing Methodology: Testing Standard shall be per AAMA 502 including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 for Water Penetration Test.
 - a. Air Infiltration Test: Conduct test in accordance with ASTM E 783 at a minimum uniform static test pressure of 1.57 psf (75 Pa) for CW or 6.24 psf (300 Pa) for AW. The maximum allowable rates of air leakage for field testing shall not exceed 1.5 times the project specifications.
 - b. Water Infiltration Test: Water penetration resistance tests shall be conducted in accordance with ASTM E 1105 at a static test pressure equal to 2/3 the specified water test pressure.
 2. Testing Extent: Architect shall select window units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present.
 3. Test Reports: Shall be prepared according to AAMA 502.

3.4 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust operating sashes, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weather tight closure. Lubricate hardware and moving parts.
- B. Clean aluminum surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- C. Clean glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.

- D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- E. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain window operating system. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION

SECTION 08700 - FINISH HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.
- B. This Section includes the following:
 - 1. Hinges.
 - 2. Key control system.
 - 3. Lock cylinders and keys.
 - 4. Lock and latch sets.
 - 5. Bolts.
 - 6. Exit devices.
 - 7. Push/pull units.
 - 8. Closers.
 - 9. Overhead holders.
 - 10. Miscellaneous door control devices.
 - 11. Door trim units.
 - 12. Protection plates.
 - 13. Weather-stripping for exterior doors.
 - 14. Sound stripping for interior doors.
 - 15. Astragals or meeting seals on pairs of doors.
 - 16. Thresholds.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 8 Section "Standard Steel Doors and Frames" for silencers integral with hollow metal frames.
 - 2. Division 8 Section "Flush Wood Doors" for factory pre-fitting and factory pre-machining of doors for door hardware.
 - 3. Division 8 Section "Aluminum Entrances and Storefronts" for aluminum entrance door hardware, except cylinders.

1.3 HARDWARE ALLOWANCE

- A. Allowance of \$0,000.00 for Certified AHC (Architectural Hardware Consultant) & FDAI (Fire Door Assembly Inspector – document of certification from DHI must be provided) to visit job site upon substantial completion as directed by Architect. A written report will be required for the Owner, Architect, and Contractor.

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1.4 QUALITY ASSURANCE

The supplier must have demonstrated willingness to coordinate field problems, and (upon reasonable compensation) to assist the Owner in re-keying and service operations. He must have a reputation for supplying quality material. Pre-bid approval is required **by Addendum** 10 days in advance of the Bid Day. The following Suppliers are accorded such approval in advance:

- a. Brabner & Hollon; Mobile, AL
- b. Warren Door; Pensacola, FL.
- c. Rayford & Associates, Inc.; Mobile, AL

1.5 SUPPLIER

A. Door hardware supplier's responsibilities shall be as follows:

1. Submittals: Submit through Contractor required product data, final hardware schedule, separate keying schedule, and samples as specified in this Section, unless otherwise indicated.
2. **Hardware Review Meeting:** Hardware Supplier shall attend a scheduled "Hardware Review Meeting" with the Contractor, Owner and Architect representative. All Hardware products, hardware installation locations, finishes, color selections, ratings and keying is to be reviewed and discussed. The Hardware Supplier understands the Hardware Submittal is not deemed "Fully Approved" until the Owner has completed their review and given "Approval".
3. Construction Schedule: Inform Contractor promptly of estimated times and dates that will be required to process submittals, to furnish templates, to deliver hardware, and to perform other work associated with furnishing door hardware for purposes of including this data in construction schedule. Comply with this schedule.
4. Coordination and Templates: Assist Contractor as required to coordinate hardware with other work in respect to both fabrication and installation. Furnish Contractor with templates and deliver hardware to proper locations.
5. Product Handling: Package, identify, deliver, and inventory door hardware specified in this Section.
6. Discrepancies: Based on requirements indicated in Contract Documents in effect at time of door hardware selection, furnish types, finishes, and quantities of door hardware, including fasteners, and Owner's maintenance tools required to comply with specified requirements and as needed to install and maintain hardware. Furnish or replace any items of door hardware resulting from shortages and incorrect items at no cost to the Owner or Contractor. Obtain signed receipts from Contractor for all delivered materials.

B. Contractor's responsibilities shall be as follows:

1. Submittals: Coordinate and process submittals for door hardware in same manner as submittals for other work.
2. **Hardware Review Meeting:** Contractor is to schedule and attend a "Hardware Review Meeting" with the Owner, Hardware Supplier and Architect Representative. All Hardware products, hardware installation locations, finishes, color selections, ratings and keying is to be reviewed and discussed. The Contractor understands the Hardware Submittal is not deemed "Fully Approved" until the Owner has completed their review and given "Approval".

3. Construction Schedule: Cooperate with door hardware supplier in establishing scheduled dates for submittals and delivery of templates and door hardware. Incorporate in construction schedule the times and dates related to furnishing hardware by door hardware supplier.
4. Coordination: Coordinate door hardware with other Work. Furnish hardware supplier or manufacturer with shop drawings of other work where required or requested. Verify completeness and suitability of hardware with supplier. Coordinate all wiring, raceways, accesses and final connections to all electronic devices and components per manufacturer requirements for a fully functioning system.
5. Product Handling: Provide secure lock-up for hardware delivered to the site. Inventory hardware jointly with representative of hardware supplier and issue signed receipts for all delivered materials.
6. Installation Information: The general types and approximate quantities of hardware required for this Project are indicated at the end of this Section in order to establish Contractor's costs for installation and other work not included in allowance.
7. No adjustments in Contract sum will be made for costs other than those covered by the allowances for subsequent increases or decreases in quantity of one or more hardware types that do not exceed 5 percent.

1.6 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.
- B. Product data includes manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 1. Upon return of the reviewed finish hardware schedule, arrange for a meeting with the Owner and representatives of Architect. A keying schedule will be established and submitted to the Architect and Owner. After review, the keying schedule will be returned to representatives of Finish Hardware Supplier so that permanent cylinders and keys can be prepared on a timely basis.

1.7 QUALITY ASSURANCE

- A. Substitutions: All substitution requests must be submitted before bidding and within the procedures and time frame as outlined in Division 1, General Requirements. Approval of products is at the discretion of the architect and his hardware consultant.
- B. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.
- C. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for a minimum of 10 years, for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced "Certified architectural hardware consultant (AHC)" as recognized by the Door and Hardware Institute (DHI). All submittals shall be signed by an AHC who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.

- D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by UL, Warnock Hersey, FM, or other testing and inspecting organization acceptable to authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels.

1.8 PRODUCT HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule and include basic installation instructions with each item or package.
- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set numbers to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- D. Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).
- E. Provide secure lock-up for door hardware delivered to the Project but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

1.9 MAINTENANCE

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

PART 2 - PRODUCTS

2.1 HINGES

A. MANUFACTURERES

- 1. Hager
- 2. McKinney
- 3. Stanley

B. MATERIAL:

- 1. Provide only template produced units
- 2. Provide Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head wood screws for installation of units in to wood. Finish screw heads to match surface of hinges or pivots.
- 3. Hinge pins, except as noted, are to be provided as follows:
 - a. Steel Hinges: Steel pins
 - b. Non-ferrous Hinges: Stainless steel pins
 - c. Exterior Doors: Use Non-Removable Pins

- d. Interior Doors: Non-rising pins
- e. Electric Hinges: Non-removable pins
- 4. Tips shall be flat button and matching plug, finished to match leaves.
- 5. Provide number of hinges indicated but not less than three (3) hinges for door leaf of 90" or less in height and one additional hinge for each 30" of additional height.
- 6. Provide ball bearing hinges of the type and weight suggested by the hinge manufacturer for each type of door application.

2.2 CONTINUOUS GEARED HINGES

A. MANUFACTURERES

- 1. Hager Companies
- 2. ABH Manufacturing
- 3. SELECT Products Ltd
- 4. Stanley
- 5. National Guard Products

B. MATERIAL:

- 1. Fully Concealed Hinges, Heavy Duty
- 2. Conform to ANSI/BHMA A156.26-2006 Grade 1.
- 3. Typical hinge height shall be 1" less than nominal door height.

2.3 LOCK CYLINERS AND KEYING

A. MANUFACTURERES

- 1. All cylinders must be keyed to the existing system for **Baldwin County Board of Education**

B. MATERIAL

- 1. Keys shall be furnished as follows:
 - a. 3 each Change Keys per core/or keyed alike group
 - b. 3 each Grand Master Key
 - c. 3 each Master Key per level
 - d. 3 each Control Key
- 2. Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall expansion capacity of 150% of the number of locks required for the project.
- 3.

2.4 ELECTRONIC HARDWARE

A. MANUFACTURERES

- 1. Basis of design is Stanley Wi-Q Technology

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2. Stanley/Precision
3. Dormakaba
4. Alarm Lock
5. *Note: A Mandatory meeting will be required for Hardware Supplier concerning all special openings requiring electronic hardware (see Hardware Sets). No material is to be ordered until verified at this meeting. Meetings will be as directed by architect including design consultant, contractor, and owner representative.*

2.5 LOCKSETS AND LATCHSETS

A. MANUFACTURERES

1. Stanley/Best 9K3 Series, 15D Design
2. No Sub – Owners Standard

B. MATERIAL

1. Locksets and latch-sets of all manufacturers must conform to the requirements of Sub paragraphs 2 and be approved by the Architect.
2. Cylindrical Lock Type
 - a. Locksets and latch sets must conform to ANSI A156.2 Series 4000, Operational Grade 1, and be UL Listed.
 - OR
3. Mortise Type
 - a. Locksets and latch sets must conform to ANSI A156.2 Series 1000, Grade 1, and be UL Listed
 - b. Locksets and latch-sets must be heavy duty mortise type with 2-3/4 in. backset, or greater as specified, with a 3/4 inch throw latch-bolt.
 - c. Locksets shall be furnished with a cylinder housing that accepts a small format interchangeable core. Cores must be furnished by Best Access Systems.
 - d. Trim to be 15D Design.

2.6 EXIT DEVICES

A. MANUFACTURERES

1. Sargent 8800 Series x ET Trim Design
2. Best/Precision Apex 2000 Series x 4900D Trim Design
3. Von Duprin 98/99 Series x 996L Trim Design

B. MATERIAL

1. All exit devices to be of one manufacturer and provided in same finish and lever design as locksets.
2. Provide sex nuts and bolts for attachment of surface applied items to doors.
3. Devices shall be UL listed. Devices for fire rated openings shall bear factory installed UL markings that indicate approval for fire rated openings.

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4. All exit devices shall be touch-bar type design and Grooved aluminum extrusions are not allowed.
5. All exit devices shall comply with ANSI A156.3, Grade 1.
6. Exit devices must meet hurricane code where required.
7. Exit device lever trim shall be equal to 15D design.

2.7 CLOSERS

A. MANUFACTURERES

1. LCN – 4040XP Series
2. Stanley/Best – HD8000 Series
3. Hager Companies - 5100 Series

B. MATERIAL

1. Size of units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.
 - a. Where parallel arms are indicated for closers, provide closer unit one size larger than recommended for use with standard arms.
 - b. Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units, ANSI opening force and delayed action closing.
2. Provide manual closers that are certified to exceed ten million (10,000,000) full load operating cycles by a recognized independent testing laboratory. Closers are to be fully hydraulic, rack and pinion action with high strength cast aluminum or cast iron cylinders and one piece forged steel pistons. Hydraulic fluid to be of a type requiring no seasonal adjustments for temperature. Hydraulic regulation to be controlled by tamper-proof, non-critical screw valves, adjustable with a hex by tamper-proof, non-critical screw valves, adjustable with a hex wrench. Separate adjustments for back check, general speed, and latch speed. Where detailed on double lever arm closers, provide a delayed action feature to delay closing up to one minute for maximum opening to approximately 75 degrees. Back check shall be properly located for protection of the door, frame and applied hardware.
2. Use of closers with built-in spring or cushion stops will be allowed in lieu of overhead stops.
3. All door closers shall comply with ANSI A156.4 Grade 1 and meet the standards of ANSI A117.1 for barrier-free accessibility.

2.8 OVERHEAD STOPS AND HOLDERS

A. MANUFACTURERES

1. Dormakaba
2. ABH Manufacturing
3. Hager Companies

B. MATERIAL

1. Conform to ANSI A156.8 Grade 1.
2. Surface Mount, Heavy or Medium Duty (refer to hardware sets)

2.9 PUSH/PULLS & PROTECTION PLATES

A. MANUFACTURERES

1. Hager Companies
2. Burns Mfgr.
3. Trimco Hardware

B. MATERIAL

1. Provide manufacturers standard exposed fasteners for installation, through bolted for matched pairs, but not of single units.
2. Provide 16 gauge minimum thickness for plates.
3. Where specified in the schedule, push/pulls shall have an antimicrobial coating.

2.10 THRESHOLDS, WEATHERSTRIPPING & GASKETING

A. MANUFACTURERES

1. Zero
2. Hager
3. National Guard

B. MATERIAL

1. Provide continuous weather-stripping at each edge of every exterior door leaf, except as otherwise indicated.
2. Provide type, size and profile shown as scheduled.
3. Provide non-corrosive fasteners as recommended by manufacturer for application indicated. Do not specify adhesive backed weather-strip or gasket material.
4. Where replaceable seal strips are scheduled, provide only those units where resilient or flexible seal strip is easily replaceable from stocks maintained by manufacturer.
5. Proved standard metal threshold unit of type, size and profile shown as scheduled.

2.11 FINISHES

- A.** Hardware finishes shall conform to ANSI and shall be as listed below for aluminum, FRP, hollow metal and wood doors:

B. Finishes Table:

Butt Hinges	652 Satin Chrome Plated Steel
Continuous Geared Aluminum Hinges	628 Clear Anodized Aluminum, except at aluminum storefront doors. At Aluminum storefront doors, provide anodized or Kynar finish as required to match specified door finish.

Cont. Pin & Barrel Hinges	630 Satin Stainless Steel
Flush Bolts	626 Satin Chrome Plated
Locksets	626 Satin Chrome Plated
Exit Devices	630/626 Satin Chrome Plated
Door Closers	689 Powder Coat Aluminum
Push Plates	630 Satin Stainless Steel
Pull Plates	630 Satin Stainless Steel
Protective Plates	630 Satin Stainless Steel
Door Stops	626 Satin Chrome Plated
Overhead Holders	630 Satin Stainless Steel

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install each hardware item in compliance with manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, reinstall each item.
 - 1. Do not install surface mounted items until finishes have been completed on the substrate.
- B. Conform to ANSI A117.1 for positioning requirements for the handicapped.

3.2 PROTECTION AND CLEANING

- A. After installation, clean metal surfaces on both interior and exterior of all mortar, paint and other contaminants. After cleaning, protect work against damage.

3.3 FINAL ADJUSTMENT

- A. Whenever hardware is installed more than one month prior to occupancy or acceptance, return during the week prior to acceptance or occupancy and make a final inspection and adjustment of all hardware items in such space or area.

3.4 HARDWARE SCHEDULE

Manufacturer List

<u>Code</u>	<u>Name</u>
AB	ABH Manufacturing Inc.
BE	Best Access Systems
NA	National Guard
PR	Precision/Best
BE	Best Door Closers
HE	HES
ST	Stanley
HA	Hager
MC	McKinney

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Option List

<u>Code</u>	<u>Description</u>
C4	CAM-STANDARD CAM
CD	CYLINDER DOGGING
FL	Fire Exit Hardware
HC	Hurricane Code Device
SN	Sex Nuts (Pkg. of 4)
CSK	COUNTER SINKING OF KICK and MOP PLATES
LBR	LESS BOTTOM ROD
MCS	Mullion Cap Spacer (600 Finish)
S301	OPT. ROLLER. STRK - RIM AND TOP OF SVR
CA-03	Cylinder Attachment Kit (Rim/SVR Device)
SNB (2)	SEX BOLTS (2)
SNB (6)	SEX BOLTS (6)

Finish List

<u>Code</u>	<u>Description</u>
C	Clear Anodized Aluminum
AL	Aluminum
600	Primed for Painting
626	Satin Chromium Plated
630	Satin Stainless Steel
689	Aluminum Painted
BLACK	Black
US26D	Chromium Plated, Dull
US32D	Stainless Steel, Dull

Hardware Sets

SET #01

Dbl. Exterior Entry Door: 100. (Existing to Remain)

NOTE: All Hardware to Remain – Clean and Restore.

SET #02

Dbl. Interior Entry Door: 100A. (Existing to Remain)

NOTE: All Hardware to Remain – Clean and Restore.

SET #03

Interior Pair Vestibule Doors: 100B. **(Access Control)**

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2 Continuous Hinge	661HD UL 83"	AL	ST
1 Exit Device -Active Leaf	2103 X 4903D 36" CD S301 SNB (2)	630	PR
1 Exit Device-Inactive Leaf	2101 36" CD S301 SNB (2)	630	PR
1 Removable Mullion	KR822 MCS	600	PR
2 Rim Cylinder	12E-72 STD	626	BE
2 Mortise Cylinder	1E-74 STD C4	626	BE
4 Construction Core	1C-7 Green	GN	BE
1 Electric Strike	9500 @ Active Leaf	630	HE
1 Wiring Harness	QC-C1500		MC
1 Power Supply	BPS 12/24-1		PR
2 Door Closer	HD8016 DS	689	BE
2 Kick Plate	190S 10" x 35" CSK	630	HA
2 Silencers	307D	Grey	HA

SET #04

Dbl. Interior Entry Door: 100A. (Existing to Remain) (**Access Control**)

1 Electric Strike	8000C	630	HE
1 Wiring Harness	QC-C1500		MC
1 Power Supply	BPS 12/24-1		PR

NOTE: All other Hardware to Remain – Clean and Restore.

SET #05

Sgl. Interior Doors: 120, 125A. (Existing to Remain)

NOTE: All Hardware to Remain – Clean and Restore.

SET #06

Sgl. Interior I.T. Door: 101B.

3 Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1 Storeroom Lockset	9K3-7D15D S3 STD	626	BE
1 Construction Core	1C-7 Green	GN	BE
1 Wall Stop	236W	630	HA
3 Silencers	307D	Grey	HA

SET #07

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Sgl. Interior SRO Door: 101A.

3 Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1 Office Lockset	9K3-7AB15D S3 STD	626	BE
1 Construction Core	1C-7 Green	GN	BE
1 Wall Stop	236W	630	HA
3 Silencers	307D	Grey	HA

SET #08

Sgl. Interior Office Doors: 111, 121, 122, 123, 124, 126, 127, 128, 125B, 125D, 125E.

3 Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1 Intruder Lockset	9K3-7IN15D S3 STD	626	BE
2 Construction Core	1C-7 Green	GN	BE
1 Wall Bumper	236W	630	HA
3 Silencers	307D	Grey	HA

SET #09

Sgl. Interior Meeting Room and Lobby Entry Doors: 125, 130B, 130C.

3 Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1 Exit Device	2108 X 4908D 36" CD S301 SNB (2)	630	PR
1 Rim Cylinder	12E-72 STD	626	BE
1 Mortise Cylinder	1E-74 STD C4	626	BE
2 Construction Core	1C-7 Green	GN	BE
1 Door Closer	HD8016 AF80P	689	BE
1 Kick Plate	190S 10" x 34" B4E CSK	630	HA
3 Silencers	307D	Grey	HA

SET #10

Dbl. Interior Storage Doors: 130A.

6 Hinges	FBF179 4 1/2 X 4 1/2 NRP	26D	ST
2 Flush-bolt	282D 12"	626	HA
1 Storeroom Lockset	9K3-7D15D S3 STD	626	BE
1 Construction Core	1C-7 Green	GN	BE
1 Overhead Stop	9012A	630	AB
1 Dust Proof Strike	280X	626	BE
2 Silencers	307D	Grey	HA

SET #11

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Sgl. Interior Utility Door: 125C.

3 Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1 Storeroom Lockset	9K3-7D15D S3 STD	626	BE
1 Construction Core	1C-7 Green	GN	BE
1 Wall Bumper	236W	630	HA
3 Silencers	307D	Grey	HA

SET #12

Dbl. Interior Corridor Doors: 228D. (Existing to Remain)

NOTE: All Hardware to Remain – Clean and Restore.

SET #13

Exterior Pair FRP Doors: 228A, 228B, 229A, 229B, 230D, 247.

2 Continuous Hinge	661HD UL 83"	AL	ST
1 Exit Device -Active Leaf	HC2103 X 4903D 36" CD S301 SNB (2)	630	PR
1 Exit Device-Inactive Leaf	HC2101 36" CD S301 SNB (2)	630	PR
1 Removable Mullion	HCKR822 MCS	600	PR
2 Rim Cylinder	12E-72 STD	626	BE
2 Mortise Cylinder	1E-74 STD C4	626	BE
4 Construction Core	1C-7 Green	GN	BE
2 Door Closer	HD8016 DST	689	BE
2 Kick Plate	190S 10" x 35" B4E CSK	630	HA
1 Threshold	520S 72"	AL	HA
2 Sweeps	750SN 36"	AL	HA
1 Mullion seal	710S 7'	BL	HA

NOTE: Weather-seals are integral on the Aluminum Tube & Storefront Framing.

SET #14

Exterior Sgl. FRP Doors: 230C, 230E, 235A.

1 Continuous Hinge	661HD UL 83"	AL	ST
1 Exit Device -Active Leaf	HC2103 X 4903D 36" CD S301 SNB (2)	630	PR
1 Rim Cylinder	12E-72 STD	626	BE
1 Mortise Cylinder	1E-74 STD C4	626	BE
2 Construction Core	1C-7 Green	GN	BE

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1 Door Closer	HD8016 DST	689	BE
1 Kick Plate	190S 10" x 34" B4E CSK	630	HA
1 Threshold	520S 36"	AL	HA
1 Sweep	750SN 36"	AL	HA

NOTE: Weather-seals are integral on the Aluminum Tube Frame by Special-Lite.

SET #15

Exterior Sgl. FRP Door: 245D.

1 Continuous Hinge	661HD UL 83"	AL	ST
1 Exit Device	HC2103 X 4903D 48" CD S301 SNB (2)	630	PR
1 Rim Cylinder	12E-72 STD	626	BE
1 Mortise Cylinder	1E-74 STD C4	626	BE
2 Construction Core	1C-7 Green	GN	BE
1 Door Closer	HD8016 DST	689	BE
1 Kick Plate	190S 10" x 47" CSK	630	HA
1 Threshold	520S 48"	AL	HA
1 Sweep	750SN 48"	AL	HA

NOTE: Weather-seals are integral on the Aluminum Tube Frame by Special-Lite.

SET #16

Dbl. Interior Connector Doors: 228C. **(Fire Rated)**

2 Continuous Hinge	661HD UL 83"	AL	ST
1 Exit Device-Inactive Leaf	FL2201 48" x 84" LBR S301 SNB (6)	630	PR
1 Exit Device-Active Leaf	FL2214 x 4914D 48" x 84" LBR S301 SNB (2)	630	PR
2 Door Closer	HD8016 AF80P	689	BE
2 Magnetic Holders	2100	689	AB
2 Kick Plate	190S 10" x 47" CSK	630	HA
1 Set Smoke-seal	726S 25'	CH	HA

SET #17

Interior Pair Vestibule Doors: 230A, 230B.

2 Continuous Hinge	661HD UL 83"	AL	ST
1 Exit Device -Active Leaf	2108 X 4908D 36" CD S301 SNB (2)	630	PR
1 Exit Device-Inactive Leaf	2101 36" CD S301 SNB (2)	630	PR
1 Removable Mullion	KR822 MCS	600	PR
2 Rim Cylinder	12E-72 STD	626	BE
2 Mortise Cylinder	1E-74 STD C4	626	BE
4 Construction Core	1C-7 Green	GN	BE
2 Door Closer	HD8016 DST	689	BE
2 Kick Plate	190S 10" x 35" CSK	630	HA
1 Wall Bumper	232W	630	HA

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2 Silencers	307D	Grey	HA

NOTE: Mount Door Closers to Dead stop @ 95 degrees.

SET #18

Sgl. Interior Kitchen Office Doors: 237A, 237B.

3 Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1 Office Lockset	9K3-7AB15D S3 STD	626	BE
2 Construction Core	1C-7 Green	GN	BE
1 Overhead Stop	9012A	630	AB
1 Kick Plate	190S 10" x 34" B4E CSK	630	HA
3 Silencers	307D	Grey	HA

SET #19

Sgl. Interior Chase Doors: 231, 234.

3 Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1 Storage Lockset	9K3-7D15D S3 STD	626	BE
1 Construction Core	1C-7 Green	GN	BE
1 Overhead Stop	9012 A	630	AB
3 Silencers	307D	Grey	HA

SET #20

Sgl. Interior Kitchen Storage Doors: 238A, 238B, 244.

3 Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1 Entry Lockset	9K3-7AB15D S3 STD	626	BE
1 Construction Core	1C-7 Green	GN	BE
1 Overhead Stop	9012 A	630	AB
3 Silencers	307D	Grey	HA

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Sgl. Interior Locker Room Door: 242C.

3 Hinges	FBB179 4 1/2 X 4 1/2	26D	ST
1 Deadlock	8T3-7S	626	BE
1 Push Plate	30S 8" X 16"	630	HA
1 Pull Plate	H 33G 4" X 16"	630	HA
1 Construction Core	1C-7 Green	GN	BE
1 Door Closer	HD8016 AF80P	689	BE
1 Kick Plate	190S 10" x 34" CSK	630	HA
1 Mop Plate	190S 6" x 35" CSK	630	HA
1 Wall Bumper	232W	630	HA
3 Silencers	307D	Grey	HA

SET #22

Sgl. Interior Locker Room Door: 232, 233.

3 Hinges	FBB179 4 1/2 X 4 1/2	26D	ST
1 Push Plate	30S 8" X 16"	630	HA
1 Pull Plate	H 33G 4" X 16"	630	HA
1 Door Closer	HD8016 AF80P	689	BE
1 Kick Plate	190S 10" x 34" CSK	630	HA
1 Mop Plate	190S 6" x 35" CSK	630	HA
1 Wall Bumper	232W	630	HA
3 Silencers	307D	Grey	HA

SET #23

Sgl. Interior Kitchen Toilet Doors: 242A, 242B.

3 Hinges	FBB179 4 1/2 X 4 1/2	26D	ST
1 Privacy Set	9K3-0L14D S3	626	BE
1 Door Closer	HD8016 AF80P	689	BE
1 Kick Plate	190S 10" x 34" CSK	630	HA
1 Mop Plate	190S 6" x 35" CSK	630	HA
1 Wall Bumper	236W	630	HA
3 Silencers	307D	Grey	HA

SET #24

Sgl. Interior Laundry Door: 243.

3 Hinges	FBB168 4 1/2 X 4 1/2	26D	ST
1 Office Lockset	9K3-7AB15D S3 STD	626	BE
2 Construction Core	1C-7 Green	GN	BE
1 Overhead Stop	9012A	630	AB
1 Kick Plate	190S 30" x 38" CSK	630	HA
1 Wall Bumper	236W	630	HA

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3 Silencers	307D	Grey	HA

SET #25

Sgl. Interior Janitor Door: 246.

3 Hinges	FBF168 4 1/2 X 4 1/2	26D	ST
1 Storeroom Lockset	9K3-7D15D S3 STD	626	BE
2 Construction Core	1C-7 Green	GN	BE
1 Overhead Stop	9012A	630	AB
1 Kick Plate	190S 30" x 38" CSK	630	HA
1 Wall Bumper	236W	630	HA
3 Silencers	307D	Grey	HA

SET #26

Sgl. Interior Serving Line Door: 235E.

3 Hinges	FBF168 4 1/2 X 4 1/2	26D	ST
1 Exit Device	2108 X 4908D 36" CD S301 SNB (2)	630	PR
1 Rim Cylinder	12E-72 STD	626	BE
1 Mortise Cylinder	1E-74 STD C4	626	BE
2 Construction Core	1C-7 Green	GN	BE
1 Door Closer	HD8016 DST	689	BE
1 Kick Plate	190S 10" x 34" B4E CSK	630	HA
3 Silencers	307D	Grey	HA

SET #27

Sgl. Interior Dishwash Entry Door: 245A.

3 Hinges	FBF179 4 1/2 X 4 1/2	26D	ST
1 Lockset	9K3-AB15D S3 STD	626	BE
1 Construction Core	1C-7 Green	GN	BE
1 Door Closer	HD8016 FHP	689	BE
1 Wall Stop	236W	630	HA
3 Silencers	307D	Grey	HA

SET #28

Sgl. Interior Dbl -Acting Traffic Doors: 236A, 236B, 236C, 245C.

NOTE: All Hardware by the Traffic Door Manufacturer.

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Interior Coiling Doors: 235B, 235C, 235D.

NOTE: All Hardware by the Coiling Door Manufacturer.

SET #30

Interior Shutter Door: 245B.

NOTE: All Hardware by the Shutter Door Manufacturer.

NOTES:

- A) INSTALL ALL DOOR CLOSERS AWAY FROM CORRIDORS AND PUBLIC VIEW.
- B) ALL EXTERIOR & INTERIOR CYLINDERS AND LOCKSETS TO HAVE KEYED CONSTRUCTION CORES THROUGH-OUT THE CONSTRUCTION PHASE.

END OF SECTION 087100

SECTION 08800 – GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Glass for windows
 - 2. Glass for doors
 - 3. Glass for storefront framing.
 - 4. Glazing sealants and accessories.

1.2 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass as defined in referenced glazing publications.
- B. Glass Fabricators: Firms that produce the fabricated glass products. Fabrication processes include cutting, heat processing, insulating, spandrel, laminating and other as fabrication activities defined in referenced glazing publications.

1.3 REFERENCE STANDARDS

- A. American Society of Test and Material (ASTM)
 - 1. ASTM C1036: Standard Specification for Flat Glass
 - 2. ASTM C1048: Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass
 - 3. ASTM C1172: Standard Specification for Laminated Architectural Flat Glass
 - 4. ASTM C1376: Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Glass.
 - 5. ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials
 - 6. ASTM E1886: Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials
 - 7. ASTM E1996: Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes
 - 8. ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation
- B. American National Standards Institute (ANSI)
 - 1. ANSI z97.1: For Safety Glazing Materials Used In Buildings - Safety Performance Specifications And Methods Of Test
- C. Consumer Products Safety Commission
 - 1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials
- D. International Code Council
 - 1. ICC 500: ICC/NSSA Standard for the Design and Construction of Storm Shelters
- E. Underwriters Laboratory (UL)
 - 1. UL 263: Standard for Fire Tests of Building Construction and Material
 - 2. UL 9: Standard for Fire test of Window Assemblies
 - 3. UL 10B: Standard for Fire Tests of Door Assemblies
 - 4. UL 10C: Standard for Positive Pressure Fire Tests of Door Assemblies

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F. National Fire Protection Association (NFPA)

1. NFPA 80: Standard for Fire Doors and Other Opening Protectives
2. NFPA 257: Standard on Fire Test for Window and Glass Block Assemblies
3. NFPA 252: Standard Methods of Fire Test of Door Assemblies

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product provide performance characteristics, certificates of compliance, installation instructions, and cleaning and maintenance instructions.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12" x 12" inches (300 mm) square. For each type of sealant/gasket exposed to view; 12" length sample. Install sealant/gasket sample between two strips of materials representative of adjoining framing system in color.
- 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.

1.6 INFORMATIONAL SUBMITTALS

- A. Preconstruction adhesion and compatibility test report.

1.7 QUALITY ASSURANCE

- A. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
- B. Single Source Responsibility: Provide materials obtained from one source for each type of glass and glazing product indicated

1.8 PRECONSTRUCTION TESTING

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.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

1.10 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes. Install glazing sealants only when temperatures are in middle third of manufacturer's recommended installation temperature range.

1.11 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: Ten (10) years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
 - 1. Warranty Period: Five (5) years from date of Substantial Completion.
- C. 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: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Approved Manufacturers: Subject to compliance with requirements, provide AGC Glass North America, Inc or approved equal product by one of the following:
 - 1. AGC Glass North America (Basis of Design)
 - 2. Pilkington North America
 - 3. Viracon
- B. Approved Fabricators: Subject to compliance with requirements
 - 1. American Insulated Glass
 - 2. OldCastle Building Envelope
 - 3. Trulite Glass and Aluminum Solutions
 - 4. Tristar Glass

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer to design glazing. 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 product that are similar to those indicated for this Project in material, design, and extent.
- 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.
- C. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

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- D. Windborne-Debris-Impact Resistance: Exterior glazing shall comply with protection testing requirements in ASTM E 1996 for Wind Zones when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on Project and shall be installed in same manner as glazing indicated for use on Project.
 - 1. Large-Missile Test: For glazing located within 30 feet (9.1 m) of grade.
 - 2. Small-Missile Test: For glazing located more than 30 feet (9.1 m) above grade.
- E. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- F. 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 7.3 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 LBNL's WINDOW 7.3 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", "Glazing Manual", and "Sealant 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 another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- 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, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.
- F. Heat-Treated Float Glass: Where heat treated float glass is required or indicated provide glass in accordance to ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
 - 2. For uncoated glass, comply with requirements for Condition A.

3. For coated vision glass, comply with requirements for Condition C (other coated 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.
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.
- C. 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.
- D. Sputtered Coated Low-Emissivity Clear Vision Glass, ASTM C 1376, Kind CV (coated vision glass), coated by sputtered process, ASTM C 1036, Type I, Class I (clear) or Class 2 (tinted) as indicated, Quality-Q3.
- E. Pyrolytic Coated Low-Emissivity Clear Vision Glass, ASTM C 1376, Kind CO (coated overhead glass), coated by pyrolytic process, ASTM C 1036, Type I, Class I (clear) or Class 2 as indicated, Quality-Q3.
- F. Ceramic-Coated Vision Glass: ASTM C 1048, Condition C, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3; and complying with Specification No. 95-1-31 in GANA's "Engineering Standards Manual."
- G. Reflective-Coated Vision Glass: ASTM C 1376.

2.5 LAMINATED GLASS

- A. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation
 1. Construction: Laminate glass with polyvinyl butyral interlayer or ionoplast interlayer to comply with interlayer manufacturer's written instructions.
 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 3. Interlayer Color: Clear unless otherwise indicated.
- B. Windborne-Debris-Impact-Resistant Laminated Glass: Comply with requirements specified above for laminated glass except laminate glass with one of the following to comply with interlayer manufacturer's written instructions:
 1. Polyvinyl butyral interlayer.
 2. Polyvinyl butyral interlayers reinforced with polyethylene terephthalate film.
 3. Ionoplast interlayer.

2.6 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.
 - a. Primary Seal: Polyisobutylene
 - b. Secondary Seal: Two-part Silicone
 2. Spacer: Manufacturer's standard spacer material and construction
 - a. Color: As select by architect from fabricators full range of colors

2.7 FIRE PROTECTIVE-RATED GLASS

- A. Fire -Protective -Rated Glazing: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire -protection ratings indicated, based on positive -pressure testing according to NFPA 257 or UL 9, including the hose -stream test, and shall comply with NFPA 80.
 - 1. Fire -protection -rated glazing required to have a fire -protection rating of 20 minutes shall be exempt from the hose -stream test.
- B. Fire -Protective -Rated Glazing Labeling: Permanently mark fire -protection -rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name; test standard; whether glazing is permitted to be used in doors or openings; if permitted in openings, whether or not glazing has passed the hose -stream test; whether or not glazing meets 450 deg F (250 deg C) temperature -rise limitation; and the fire -resistance rating in minutes.
- C. Fire -Protective -Rated Tempered Glass: 6 -mm thickness, fire -protection -rated tempered glass; and complying with 16 CFR 1201, Category II.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Safti First; SuperLite I
 - b. Technical Glass Products; Fireglass20
 - c. Vetrotech Saint-Gobain; SSG Pyroswiss US
 - 1. Fire-Protective Rated Ceramic: 5mm thickness, fire protective rated ceramic, non-safety ratedProducts: Subject to compliance with requirements, provide one of the following:
 - a. Schott Pyran Platinum
 - b. Technical Glass Products Firelite
- D. Fire-Protective Rated Ceramic-Filmed: 5mm thickness, fire protective rated ceramic, safety rated, complying with 16 CFR 1201, Category II
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Schott Pyran Platinum-F
 - b. Technical Glass Products Firelite-NT
- E. Fire-Protective Rated Ceramic-Laminated: 9mm thickness, fire protective rated ceramic, safety rated, complying with 16 CFR 1201, Category II
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Schott Pyran Platinum-L
 - b. Technical Glass Products Firelite-Plus

2.8 FIRE -RESISTANCE -RATED GLAZING

- A. Fire -Resistance -Rated Glazing: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire -resistance ratings indicated, based on testing according to ASTM E 119 or UL 263.
- B. Fire -Resistance -Rated Glazing Labeling: Permanently mark fire -resistance -rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, test standard, that the glazing is approved for use in walls, and the fire -resistance rating in minutes.
- C. Fire-Resistance Rated Intumescent Glazing: 16mm-52mm thickness, multiply constructed laminated with fire resistive intumescent interlayers, and complying with 16 CRF 1201, Category II.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. AGC Glass - Pyrobel

- b. Pilkington - Pyrostop

2.9 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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Dow Corning Corporation.
 - b. GE Construction Sealants; Momentive Performance Materials Inc.
 - c. May National Associates, Inc.; a subsidiary of Sika Corporation.
 - d. Pecora Corporation.
 - e. Sika Corporation.
 - f. Tremco Incorporated.

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

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation-Construction Systems.
 - b. Dow Corning Corporation.
 - c. GE Construction Sealants; Momentive Performance Materials Inc.
 - d. May National Associates, Inc.; a subsidiary of Sika Corporation.
 - e. Pecora Corporation.
 - f. Polymeric Systems, Inc.
 - g. Sika Corporation.
 - h. Tremco Incorporated.

D. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bostik, Inc.
 - b. Dow Corning Corporation.
 - c. GE Construction Sealants; Momentive Performance Materials Inc.
 - d. May National Associates, Inc.; a subsidiary of Sika Corporation.
 - e. Polymeric Systems, Inc.

- f. Schnee-Morehead, Inc., an ITW company.
 - g. Sika Corporation.
 - h. Tremco Incorporated.
- E. Glazing Sealant: Acid-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation-Construction Systems.
 - b. Bostik, Inc.
 - c. Dow Corning Corporation.
 - d. GE Construction Sealants; Momentive Performance Materials Inc.
 - e. May National Associates, Inc.; a subsidiary of Sika Corporation.
 - f. Pecora Corporation.
 - g. Polymeric Systems, Inc.
 - h. Schnee-Morehead, Inc., an ITW company.
 - i. Sika Corporation.
 - j. Tremco Incorporated.
- F. Glazing Compounds for Fire-rated Glazing Materials
 - 1. Glazing Compound: DAP 33 putty
 - 2. Silicone Sealant: One-part neutral curing silicone, medium modulus sealant, Type S;
 - 3. Grade NS; Class 25 with additional movement capability of 50 percent in both extension
 - 4. and compression (total 100 percent); Use (Exposure) NT; Uses (Substrates) G, A, and O as applicable. Available Products:
 - a. Dow Corning 795 - Dow Corning Corp.
 - b. Silglaze-II 2800 - General Electric Co.
 - c. Spectrem 2 - Tremco Inc

2.10 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 804.3 tape, where indicated.
 - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
 - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.
- C. Fire-rated Glazing Tape: Closed cell polyvinyl chloride (PVC) foam, coiled on release paper over

adhesive on two sides, maximum water absorption by volume of 2 percent. Glass panels that exceed 1,393 sq. inches for 90-minute ratings must be glazed with fire-rated glazing tape supplied by manufacturer.

2.11 MISCELLANEOUS GLAZING MATERIALS

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Non-Fire Rated Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- C. Fire-rated Setting Blocks: Neoprene, EPDM, or silicone; tested for compatibility with glazing compound; of 70 to 90 Shore A hardness.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

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 (1270 mm).
- 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 where indicated.

- F. Center glass lites in openings on setting block 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 where indicated.

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.

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.
- B. Remove and replace glass that is damaged during construction period.
- C. Wash glass on both faces not more than 4 days prior to date scheduled for inspection intended to establish date of substantial completion in each area of the project. Wash glass with methods as recommended by glass manufacturer.

3.6 INSULATING GLASS SCHEDULE

- A. Glass Type [IG-3]: Tinted Low-E insulating glass.
 - 1. Basis-of-Design Product: AGC Glass North America; Energy Select 25.
 - 2. Overall Unit Thickness: 1 inch (25 mm).

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3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Tinted fully tempered float glass.
5. Tint Color: Solarshield Pure Grey, Bronze or Forest Green.
 - a. Color to be selected by Architect after Bid Date.
6. Interspace Content: Air.
7. Indoor Lite: Clear fully tempered float glass.
8. Low-E Coating: Sputtered on second surface
9. Winter Nighttime U-Factor: .29 maximum.
10. Summer Daytime U-Factor: .27 maximum.
11. Visible Light Transmittance:
 - a. Pure Grey -36 percent minimum.
 - b. Bronze -39 percent minimum.
 - c. Forest Green -48 percent minimum.
12. Solar Heat Gain Coefficient:
 - a. Pure Grey -.25 maximum.
 - b. Bronze -.25 maximum.
 - c. Forest Green -.25 maximum.
13. Safety glazing required.

3.7 INSULATING-LAMINATED-GLASS SCHEDULE

- A. Glass Type [IGLM-2]: Tinted Low-E Large Missile Laminated insulating glass.
 1. Basis-of-Design Product: AGC Glass North America; Energy Select 25 Pure Grey.
 2. Overall Unit Thickness: 1-5/16 inch (33 mm).
 3. Minimum Thickness of Outdoor Lite: 1/4 inch (6 mm).
 4. Outdoor Lite: Tinted Fully tempered float glass.
 5. Tint Color: Solarshield Pure Grey, Bronze or Forest Green.
 - a. Color to be selected by Architect after Bid Date.
 6. Interspace Content: Air.
 7. Indoor Lite: Clear laminated glass with two plies of heat strengthened float glass.
 - a. Minimum Thickness of Each Glass Ply: 1/4 inch (6 mm).
 - b. Interlayer Thickness: 0.090 inch (2.26 mm) minimum.
 8. Low-E Coating: Sputtered on second surface.
 9. Winter Nighttime U-Factor: .28 maximum.
 10. Summer Daytime U-Factor: .26 maximum.
 11. Visible Light Transmittance: 35 percent minimum.
 12. Solar Heat Gain Coefficient: .25 maximum.
 13. Safety glazing required.
 14. Certification: Third party certification required
- B. Glass Type [IGSM-2]: Tinted Low-E Small Missile Laminated insulating glass.

1. Basis-of-Design Product: AGC Glass North America; Energy Select 25 Pure Grey.
2. Overall Unit Thickness: 1-5/16 inch (33 mm).
3. Minimum Thickness of Outdoor Lite: 1/4 inch (6 mm).
4. Outdoor Lite: Tinted Fully tempered float glass.
5. Tint Color: Solarshield Pure Grey, Bronze or Forest Green.
 - a. Color to be selected by Architect after Bid Date.
6. Interspace Content: Air.
7. Indoor Lite: Clear laminated glass with two plies of heat strengthened float glass.
 - a. Minimum Thickness of Each Glass Ply: 1/4 inch (6 mm).
 - b. Interlayer Thickness: 0.060 inch (1.52 mm) minimum.
8. Low-E Coating: Sputtered on second surface.
9. Winter Nighttime U-Factor: .28 maximum.
10. Summer Daytime U-Factor: .26 maximum.
11. Visible Light Transmittance: 35 percent minimum.
12. Solar Heat Gain Coefficient: .25 maximum.
13. Safety glazing required.
14. Certification: Third party certification required

END OF SECTION

SECTION 09250 - GYPSUM DRYWALL

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. Types of work include:
 - 1. Gypsum drywall at walls and ceilings.
 - 2. Drywall finishing (joint tape-and-compound treatment).

1.3 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Where gypsum drywall systems with fire- resistance ratings are indicated, provide materials and installations which are identical with those of applicable assemblies tested per ASTM E 119 by fire testing laboratories acceptable to authorities having jurisdiction.
 - 1. Provide fire-resistance rated assemblies identical to those indicated by reference to GA File No.'s. in GA "Fire Resistance Design Manual" or to design designations in UL "Fire Resistance Directory" or in listing of other testing and agencies acceptable to authorities having jurisdiction.
- B. Gypsum Board Terminology Standard: GA-505 by Gypsum Association.
- C. Single-Source Responsibility: Obtain gypsum board products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum boards.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications and installation instructions for each gypsum drywall component, including other data as may be required to show compliance with these specifications.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store material inside under cover and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.
- C. Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal corner beads and trim from being bent or damaged.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements, General: Comply with requirements of referenced gypsum board application standards and recommendations of gypsum board manufacturer, for environmental conditions before, during and after application of gypsum board.
- B. Cold Weather Protection: When ambient outdoor temperatures are below 55 degrees F maintain continuous, uniform, comfortable building working temperatures of not less than 55 degrees F for a minimum period of 48 hours prior to, during and following application of gypsum board and joint treatment materials or bonding of adhesives.
- C. Ventilation: Ventilate building spaces as required to remove water in excess of that required for drying of joint treatment material immediately after its application. Avoid drafts during dry, hot weather to prevent too rapid drying.

PART 2 - PRODUCTS

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2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Gypsum Board and Related Products:
 - a. Georgia-Pacific Corp.
 - b. Gold Bond Building Products Div., National Gypsum Co.
 - c. United States Gypsum Co.
 - d. CertainTeed Corporation
 - e. Lafarge North America
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS

- A. Gypsum Wallboard: ASTM C 36, of types, edge configuration and thickness indicated below; in maximum lengths available to minimize end-to-end butt joints.
 - 1. Provide Type "X" fire-resistant at all locations unless otherwise where identified by a UL Listing or Classification or as denoted on the drawings.
 - 2. Provide Type "C", fire-resistant where identified by a UL Listing or Classification where denoted on the drawings.
 - 3. Impact/Penetration Resistant Type "X" fire-resistant at locations as identified on the drawings. Equal to Hi-Impact Brand 2000 Fire Shield by National Gypsum. Tested in accordance with ASTM C36/C 1396 Type X, ASTM E 695, ASTM D 1037, ASTM D4977 and ASTM D 4060.
 - 4. Provide Type "MR" moisture resistant, where gypsum board is shown at all wet areas (Restrooms, etc.) install 5/8" moisture resistant gypsum board at all wet walls where plumbing fixtures are shown.
 - 5. Thickness: 5/8" unless otherwise indicated.
 - 6. Edges: Manufacturer's standard.

2.3 TRIM ACCESSORIES

- A. General: Provide manufacturer's standard trim accessories of types indicated for drywall work, formed of galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for nailing or stapling, and beaded for concealment of flanges in joint compound. Provide corner beads, L-type edge trim-beads, U-type edge trim-beads, special L-kerf-type edge trim-beads, and one-piece control joint beads.
- B. Non-Beaded Trim: Non-beaded trim shall not be used, except with specific approval by the Architect.

2.4 JOINT TREATMENT MATERIALS

- A. General: ASTM C 475; type recommended by the manufacturer for the application indicated, except as otherwise indicated.
- B. Joint Tape: Paper reinforcing tape.
- C. Joint Compound: Ready-mixed vinyl-type for interior use.

1. Grade: A single multi-purpose grade, for entire application.

2.5 MISCELLANEOUS MATERIALS

- A. General: Provide auxiliary materials for gypsum drywall work of the type and grade recommended by the manufacturer of the gypsum board.
- B. Gypsum Board Screws: Comply with ASTM C 646.
- C. Gypsum Board Nails: Comply with ASTM C 514.
- D. Concealed Acoustical Sealant: Nondrying, nonhardening, nonskinning, nonstaining, nonbleeding, gunnable sealant for concealed applications per ASTM C 919.
- E. Exposed Acoustical Sealant: Nonoxidizing, skinnable, paintable, gunnable sealant for exposed applications per ASTM C 919.
- F. Water-Resistant Adhesive: Type I organic adhesive for ceramic tile complying with ANSI A136.1.

PART 3 - EXECUTION

3.1 GENERAL GYPSUM BOARD INSTALLATION REQUIREMENTS

- A. Gypsum Board Application and Finishing Standards: ASTM C 840 and GA 216.
- B. Locate exposed end-butt joints as far from center of walls possible, and stagger not less than 1'-0" in alternate courses of board.
- C. Install wall/partition boards vertically to avoid end-butt joints wherever possible.
- D. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16" open space between boards. Do not force into place.
- E. Locate all edge and end joints over supports. Stagger vertical joints over different studs on opposite sides of partitions.
- F. Attach gypsum board to supplementary framing and blocking provided for additional support at openings and cutouts.
- G. Form control joints and expansion joints with space between edges of boards, prepared to receive trim accessories.
- H. Cover both faces of stud framing with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls which are braced internally.
 1. Except where concealed application is required for sound, fire, air or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. area and may be limited to not less than 75% of full coverage.
- I. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4" to 1/2" space and trim edge with J-type semi-finishing edge trim. Seal joints with acoustical sealant.
- J. Space fasteners in gypsum boards in accordance with referenced standards and manufacturer's recommendations, except as otherwise indicated.

3.2 METHODS OF GYPSUM DRYWALL APPLICATION

- A. Single-Layer Application: Install gypsum wallboard.
- B. On partitions/walls apply gypsum board vertically unless otherwise indicated and provide sheet lengths which will minimize end joints.

3.3 INSTALLATION OF DRYWALL TRIM ACCESSORIES

- A. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges by nailing or stapling in accordance with manufacturer's instructions and recommendations.

- B. Install metal corner beads at external corners of drywall work.
- C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed, and except where plastic trim is indicated. Provide type with face flange to receive joint compound except where semi-finishing type is indicated. Install L-type trim where work is tightly abutted to other work and install special kerf-type where other work is kerfed to receive long leg of L-type trim. Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).
- D. Install semi-finishing trim where indicated, and where exterior gypsum board edges are not covered by applied moldings or indicated to receive trim with face flanges covered with joint compound.
- E. Provide control joints horizontally and/or vertically at no less than 24'-0" o.c. max. Refer to plans for specific location or installed as directed by Architect.
- F. Install H-molding in exterior gypsum drywall work where control joints are indicated.

3.4 FINISHING OF DRYWALL

- A. General: Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration. Prefill open joints and rounded or beveled edges, if any, using type of compound recommended by manufacturer.
 - 1. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.
 - 2. Apply joint compound in 3 coats (not including prefill of openings in base), and sand between last 2 coats and after last coat.
 - 3. Tape and finish gypsum board in accordance with ASTM C 840, GA 214 and GA 216.
 - 4. Provide joint, fastener depression, and corner treatment. Do not use fiber glass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Provide treatment for water-resistant gypsum board as recommended by the gypsum board manufacturer.
 - 5. Where gypsum surfaces are to be finished to Level 5 in accordance with GA 214, apply a thin skim coat of joint compound to the entire gypsum board surface, after the two-coat joint and fastener treatment is complete and dry.
 - 6. **All Exposed gypsum board surfaces** shall be finished to a minimum **Level 4** in accordance with GA 214.
 - 7. Where gypsum board is to receive eggshell, semi-gloss or gloss paint finish, or where severe, up or down lighting conditions occur, shall be finished to **Level 5** in accordance to GA 214 Level 5, unless indicated otherwise.
 - 8. All gypsum board surfaces at **all Corridors** shall be finished to **Level 5** in accordance to GA 214 Level 5.
 - 10. Plenum areas above ceilings shall be finished to **Level 1** in accordance with GA 214.
 - 11. Water resistant gypsum backing board, ASTM C 630/C 630M, to receive ceramic tile shall be finished to **Level 2** in accordance with GA 214.
 - 12. Walls and ceilings to receive a heavy-grade wall covering or heave textured finish before painting shall be finished to **Level 3** in accordance with GA 214.
- B. Partial Finishing: Omit third coat and sanding on concealed drywall work which is indicated for drywall finishing or which requires finishing to achieve fire-resistance rating, sound rating or to act as air or smoke barrier.
- C. Refer to section on painting in Division 9 for decorative finishes to be applied to drywall work.

3.5 PROTECTION OF WORK

- A. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures gypsum drywall work being without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 09290 – GLASS FIBER REINFORCED CEMENT COLUMN COVERS (GFRC)

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. Types of work include:
 - 1. Glass fiber reinforced cement column covers (GFRC) for Exterior Columns.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications and installation instructions for each component, including other data as may be required to show compliance with these specifications.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store material inside under cover and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes.
- C. Handle materials and products to prevent damage to edges, ends or surfaces.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements, General: Comply with requirements of referenced product application standards and recommendations of manufacturer, for environmental conditions before, during and after application of product.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. GFRC: Glass fiber reinforced cement column covers and related trim pieces:
 - a. Fiblast, LLC.; 1602 Mizell Road, Tuskegee, AL, 36083; Ph.: 334.513.1314; www.fiblast.com.
 - b. Melton Classics, Inc., 175 Langley Drive, Lawrenceville, GA, 30046; Ph.: 800.963.3060; www.meltonclassics.com.
 - c. Stromberg Architectural Products; 4400 Oneal St. #100, Greenville, TX 75401: Ph.: 903.454.0904; www.strombergarchitectural.com.
 - d. Georgia Precast Solutions, LLC, 1324 Southern Rd., Morrow, GA; Ph.: 470.557.1027; www.georgiaprecast.com.
 - e. Custom Castings Northeast, Inc.; 267 Pinetop Road, Bigler, PA 16825; Ph.: 814.857.1766; www.customcastings.net.
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS

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- A. Glass fiber reinforced cement column covers, trim and accessories shall be made from asbestos free, high density concrete or gypsum reinforced with glass fibers.
- B. Manufacturer's standard accessories shall be included to provide a complete system for application shown on drawings.
- C. TOLERANCES (FABRICATION)
 - 1. Dimensional - all directions +/- 1/8"
 - 2. Thickness - skin +/- 1/16"
 - 3. Thickness - total unit 1/4" - 3/8"
 - 4. Warpage or Bowing +/- 1/16"/foot
 - 5. Out of Plane - unit to unit +/- 1/8"
- D. PHYSICAL PROPERTIES
 - 1. Shell Thickness (+ -)3/8"
 - 2. Weight (depending on reinforcement) 2-1/2 – 4 lbs/sq.ft
 - 3. Density 130 – 140 lbs/cu.ft.
 - 4. Compressive Strength (ASTM C-109-92 Mod.) 9,810 p.s.i.
 - 5. Flexural Strength (ASTM C-947-89 Mod.) 2,060 p.s.i.
 - 6. Modulus of Elasticity – In Flexure (ASTM D638-94b Mod.) 2.28 x 10⁶ p.s.i.
 - 7. Tensile Strength (ASTM D-638-94b Mod.) 940 p.s.i.
 - 8. Impact Strength (ASTM D-256-93a; Method A) 1.30 ft-lbs/in of notch
 - 9. Coefficient of Linear Thermal Expansion (ASTM D-696-91) 0.60 x 10⁻⁵/°F
 - 10. Humidified Deflection (ASTM C-473-95) No Measurable Value
 - 11. Thermal Conductivity (ASTM C-177-85 (1993) 4.35Btu-in/hr-sq.ft-°F
 - 12. Fuel Contribution (ASTM E-136-98a) 0
 - 13. Flame Spread (ASTM E-84-98) 0, Class A
 - 14. Smoke Index (ASTM E-84-98) 0, Class A
 - 15. Resistance to Weathering (ASTM G-23-93) Class 5
 - 16. Negligible Color Alteration
 - 17. Screw Withdrawal (standard lab procedure) 346 lbs
 - 18. Fiber Content 5%-6% by weight

PART 3 – EXECUTION

3.1 PRE-INSTALLATION RESPONSIBILITY

- A. Field Measurement: Prior to manufacturing, the installer will be responsible for obtaining all field dimensions for inclusion on the manufacturers shop drawings.
- B. Coordination: The installer will be responsible for the co-ordination of the installation with related sections, within the tolerances specified in the respective articles.
- C. Discrepancies: Prior to installation, the installer shall check job site dimensions and conditions. Any discrepancies between design and field dimensions shall be brought to the attention of the General Contractor and the Architect.

3.2 DELIVERY, STORAGE, HANDLING AND PROTECTION

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- A. Transport and handle units in a manner that avoids excessive stresses or damage.
- B. Components displaying obvious damage must be rejected at site at time of delivery.
- C. Store the components in a controlled environment, weather protected, on level surfaces, with temporary supports as required. Do not stack or lean.

3.3 INSTALLATION

- A. Components shall be lifted with suitable devices.
- B. Components shall be installed plumb and true. Shim where necessary.
- C. Fasten components using galvanized or stainless steel screws only through face or back as indicated on shop drawings.
- D. Where components are suspended, use as a minimum 12 gauge galvanized steel wire and the suspension points indicated on the shop drawings.
- E. Framing, hangers, etc, as specified for Gypsum Board Construction.
- F. Butt Joints are to be caulked, as specified for Section 07900, Joint Sealers.

3.4 PATCHING AND CONTROL JOINTS

- A. Introduce control joints as required and as specified under related sections of the Specifications.
- B. Patch countersunk fasteners and any damage to match component texture using suitable materials furnished by the Manufacturer or by installer.

3.5 FINISHING

- A. Finish: Provide smooth finished surface, prepared to receive paint. Painting shall be in accordance with Section 09900 - PAINTING.

END OF SECTION

SECTION 09500 – LINEAR METAL CEILING/SOFFIT 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. Linear Metal Ceiling/Soffit System.
- B. Related Sections:
 - 1. Section 16000, Electrical.

1.3 REFERENCES

- A. Abbreviations and Acronyms:
 - 1. ASTM: American Society for Testing and Materials
 - 2. IBC: International Building Code
 - 3. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures
 - 4. ICCES: International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components
 - 5. ICCES: International Code Council-Evaluation Services Report - ESR 2631 Rockfon Chicago Metallic Corporation Suspended Ceiling Framing Systems and Suspension Ceiling Systems
- B. Reference Standards:
 - 1. ASTM A1008-Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
 - 2. ASTM A641- Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
 - 3. ASTM A653-Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
 - 4. ASTM C423- Standard Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
 - 5. ASTM C635/C635M- Standard Specification for Manufacture, performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
 - 6. ASTM C636/C636M- Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
 - 7. ASTM D3273- Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
 - 8. ASTM E84- Standard Test Method for Surface Burning Characteristics of Building Materials
 - 9. ASTM E580- Installation of Metal Suspension Systems in Areas Requiring Moderate Seismic Restraint
 - 10. ASTM E1111/E1111M -Standard Test Method for Measuring the Interzone Attenuation of Open Office Components
 - 11. ASTM E1414/E1414M -Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
 - 12. ASTM E1264- Classification for Acoustical Ceiling Products

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1.4 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Meetings: Conduct meeting at Project site. Agenda includes Project conditions, coordination with work of other trades and layout of items which penetrate ceilings.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's Product data, including suspension system and maintenance data.
- B. Samples: Submit samples of specified ceiling panels.
- C. Show Drawings: Necessary technical drawings and documents that pertain to the layout of the acoustical metal ceiling.
- D. Certifications: Acoustical metal ceiling product's certifications that confirm compliance with applicable tests and standards. Acoustical metal ceiling products must also contain information pertaining to certification for NRC.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Supply additional material (full-size ceiling panels) equal to 5% of ceiling area. Additional material should match products installed and have the appropriate labels and identification.
- B. Supply extra materials that match products installed and are packaged with protective covering for storage and identified with labels describing contents.

1.7 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
- B. Fire Performance Details: Suspension ceiling components will feature markings of applicable testing and inspecting organization.
- C. Coordination of Work: Coordination between installers and other related professions in reference to acoustical ceiling work can include electrical fixtures and systems, fire safety systems, gypsum and building construction.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect system components from excessive moisture in shipment, storage, and handling. Deliver in unopened bundles and store in a dry place with adequate air circulation.

1.9 WARRANTY

- A. Manufacturer Warranty: Submit a written warranty executed by manufacturer for a period of 1 year from date for metal ceilings, of Substantial Completion, agreeing to repair or replace suspension system components that fail or are compromised within the specified warranty period. Failed or compromised parts can include, but are not limited to:
 - 1. Rusting or defects directly made by the manufacturer.
 - 2. Sagging or warping directly made by the manufacturer.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Rockfon, | 4849 South Austin Avenue, Chicago, IL 60638 | 1.800.323.7164 | www.rockfon.com.
- B. Certaineed/Hunter Douglass | 5015 Oakbrook Parkway, Suite 100, Norcross, GA 30093 | Ph: 800.366.4327 | www.certaineed.com.
- C. Armstrong World Industries Inc. | www.armstrongceilings.com | Ph: 877.276.7876
- D. Equal products of other manufacturers may be used in the work, provided such products have

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been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS

- A. Metal Panels: Linear Metal Ceiling System, "PLANARPLUS®" LINEAR CEILINGS" by Rockfon with following characteristics:
 - 1. Surface: Smooth
 - 2. Composition: Metal
 - 3. Material: 0.024"
 - 4. Panel Width: 4" wide.
 - 5. Panel Profile Depth: 5/8" deep.
 - 6. Reveal: Manufactured to provide a 3/4" reveal when installed on the manufacturer suspension system.
 - 7. Panel Length: 12 feet Standard length. 2 feet to 16 feet special lengths.
 - 8. Edges: Square
 - 9. Finish/Color: Baked Enamel Paint Finish. Color to be selected by Architect from Manufacturer Standard selections. Color shall include "White".
 - 10. Perforation: To be Non-perforated.
 - 11. Filler: Matching Integral.
 - 12. Fire Class: Class A.
- B. Accessories:
 - 1. Filler Strips (Recessed): Manufactured from aluminum 3/4 inch wide by 144 inches long coated to match linear metal panels.
 - 2. Panel Splices: Manufactured from 0.025 inch thick aluminum, 8-3/4 inches long coated with finish identical to linear metal panels, with profile compatible with linear panels.
 - 3. End Plugs: Manufactured from 0.025 inch thick aluminum with (round) (square) edges. Coated identical to linear metal panels.
 - 4. Perimeter Trim
 - a. Wall Channel: Manufactured from 0.025 inch thick aluminum 1 13/16 inch I.D. by 17/8 inch top flange by 1 inch bottom flange by 120 inches long. Coated identical to linear metal panels.
 - b. Wall Angle: Manufactured from 0.025 inch thick aluminum 15/16 inch wide by 3/4 inch high by 144 inches long with hemmed edges.
- C. Suspension System
 - 1. Symmetrical Carrier:
 - a. Manufactured to an inverted "U" shape from 0.040 inch aluminum, 12 feet/144 inches long. Coated with black polyester enamel. Double grip carrier required on all exterior applications.
 - b. Carrier tabs, to which the linear panels are attached, shall be integral to the carrier and shall protrude from each of its legs.
 - c. Holes shall be punched into the spine of the carrier in order to permit direct attachment to overhead structures when appropriate.
 - d. The symmetrical carrier shall be slotted at appropriate intervals in order to receive stabilizing components as described below.

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2. Stabilizer Bars: Manufactured from 0.025 inch thick aluminum (4913/16) (3513/16) (2313/16) inch long. Coated with black polyester enamel.
3. Radius Carrier: Manufactured to an inverted "U" shape from 0.040" thick aluminum 144" inches long with integral carrier tabs, painted black.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine suspension assemblies, with installer present, for compliance with requirements specified in this and other Sections affecting ceiling/soffit panel installation and with requirements for installation tolerances and other conditions affecting performance of ceiling/soffit assemblies.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install ceiling panels to comply with ASTM C636/C636M, ASTM E580, and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. General:
 1. For exterior soffit applications install in accordance with ASTM C636 (see 1.03, A2.)
- C. Suspension System
 1. Symmetrical Carriers: Installed 50 inches on center by direct suspension from existing structure with not less than 12 gauge hanger wires wrapped tightly 3 full turns, spaced 48 inches on center.
 2. Stabilizer Bars: Shall be utilized to increase the rigidity of the suspension system layout, as well as to permit easy alignment of the symmetrical carriers. Installed perpendicular to symmetrical carrier 24 to 48 inches on center.
- D. Linear Metal Panels:
 1. Attach to main carrier tabs and connect with Panel Splices with joints staggered in adjacent rows.
 2. Panel Splices: Where continuous runs of linear metal panels are required, panel splices shall be used to join consecutive panels and shall be of a design which eliminates any noticeable gap between the panels.
 3. End Plugs: Installed exposed ends of panels. The end plug shall be of sufficient and appropriate dimensions to fit into the open end of a linear panel. Appropriate styles of end plugs, based upon linear panel width and design, shall be made available.
 4. Slip-on Moldings: Install on exposed ends of panels. Where the ends are visible, an end cap, wall angle, or J-molding shall be utilized to trim the exposed ends of the panels.
 5. Filler Strips: Installed into open reveal between panels.
 6. Wall Angles: Installed on vertical surfaces intersecting system by appropriate method in accordance with industry accepted practice.
 7. Access Panels: If Indicated on drawings, installed in accordance with manufacturers recommendations.

3.3 REPAIR

- A. Remove damaged or compromised components; replace with undamaged components.

3.4 CLEANING

- A. Clean exposed surfaces in accordance with manufacturer's written instructions.

END OF SECTION

SECTION 09510 - ACOUSTICAL CEILINGS

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. Extent of acoustical ceilings specified in this section include the following:
 - 1. Acoustical lay-in panel ceilings in an exposed suspended metal grid system.

SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
 - 1. Full size sample of each acoustical panel type, pattern and color.
 - 2. Set of 12" long samples of exposed runners and moldings for each color and system type required.
- B. Certificates: Submit certificates from manufacturers of acoustical ceiling units and suspension systems attesting that their products comply with specification requirements.

1.3 QUALITY ASSURANCE

- A. Fire Performance Characteristics: Provide acoustical ceiling components that are identical to those tested for the following fire performance characteristics, according to ASTM test method indicated, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate marking of applicable testing and inspecting agency.
 - 1. Surface Burning Characteristics: As follows, tested per ASTM E 84.
 - 2. Flame Spread: 25 or less.
 - 3. Smoke Developed: 50 or less.
- B. Fire Resistance Ratings: As indicated by reference to design designation in UL "Fire Resistance Directory" for floor, roof or beam assemblies in which acoustical ceilings function as a fire protective membrane; tested per ASTM E 119. Provide protection materials for lighting fixtures and air ducts to comply with requirements indicated for rated assembly.
- C. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other work supported by, or penetrating through, ceilings, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition system (if any).
- D. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination or other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

1.5 PROJECT CONDITIONS

- A. Space Enclosures: Do not install interior acoustical ceilings until space is enclosed and

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weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

USG Interiors, LLC. (Basis of Design) | www.usg.com | Ph: 1.800.950.3839

1. Certainteed Corporation | www.certainteed.com | Ph: 1.800.233.8990

2. Armstrong World Industries Inc. | www.armstrongceilings.com | Ph: 877.276.7876

- B. Equal products of other manufacturers may be used in the work provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 GENERAL ACOUSTICAL CEILING TILE UNITS

- A. Standard for Acoustical Ceiling Tile Units: Provide manufacturer's standard units of configuration indicated which are prepared for mounting method designated and which comply with FS SS-S-118 requirements, including those indicated by reference to type, form, pattern, grade (NRC or NIC' as applicable), light reflectance coefficient (LR), edge detail, and joint detail (if any).

1. Mounting Method for Measuring NRC: No. 7 (mechanically mounted on special metal support), FS SS-S-118; or Type E-400 mounting as per ASTM E 795.

- B. Sound Attenuation Performance: Provide acoustical ceiling units with ratings for ceiling sound transmission class (STC) of range indicated as determined according to AMA 1-II "Ceiling Sound Transmission Test by Two-Room Method" with ceilings continuous at partitions and supported by a metal suspension system of type appropriate for ceiling unit of configuration indicated (concealed for tile, exposed for panels).

- C. Colors, Textures and Patterns: Provide products to match appearance characteristics indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors, surface textures, and patterns available for acoustical ceiling units and exposed metal suspension system members of quality designated.

2.3 ACOUSTICAL TILES

A. Acoustical Panel Type: Vinyl Covered Ceiling Panels

1. USG "Sheetrock Brand Clean Room Lay-In Gypsum Panels".

2. Classification: Provide ceiling panels complying with ASTM E 1264 for type, form and pattern as follows:

a. Type XX, mineral based with membrane faced overlay. Vinyl face, back and sides covered gypsum ceiling panels.

b. Form: Not Applicable

c. Pattern: Smooth

3. Color: Flat White 050.

4. LR: Not less than 0.77

5. NRC: Not less than: N/A

6. CAC: Not less than 35

7. Edge / Joint Detail:

a. Square (Typical if not indicated on drawings).

- b. SLT Beveled Reveal (Only if indicated on drawings).
- 8. Panel Thickness: 1/2 inch (12.7 mm).
- 9. Modular Size: 24 by 24 inches (610 by 610 mm).
- 10. Recycled Content: 80%.
- 11. Panel Features: Washable, scrubbable, soil and impact resistant finish. Meets USDA/FSIS guidelines for use in food processing areas.
- 12. Clean room performance: Acceptable in applications up to Class 100 Clean rooms.
- 13. ClimaPlus™ 30 year limited system warranty. Contains a broad spectrum antimicrobial additive on the face and back of the panel that provides resistance against the growth of mold and mildew. Includes sag resistance performance.
- 14. Suspension Grid/Width: USG Donn ZXLA; 15/16".

B. Acoustical Panel Type: Lay-In Acoustical Ceiling Panels

- 1. USG "Radar" Acoustical Panels
- 2. Classification: Provide ceiling panels complying with ASTM E 1264 for type, form and pattern as follows:
 - a. Type III, mineral base with painted finish
 - b. Form: 2, water felted.
 - c. Pattern: Perforated, small holes and light texture.
- 3. Color: Flat White 050.
- 4. LR: Not less than 0.84
- 5. NRC: Not less than 0.45
- 6. CAC: Not less than 33
- 7. Edge / Joint Detail:
 - a. SQ Square (Typical if not indicated on drawings).
 - b. SLT Beveled Reveal (Only if indicated on drawings).
- 8. Panel Thickness: 5/8 inch (15.8mm).
- 9. Modular Size: 24 by 24 inches (600 by 600 mm).
- 10. Recycled Content: Up to 59%.
- 11. Panel Features:
 - a. Biobased product that is USDA certified.
 - b. Abuse Resistant, high durability and can be cleaned easily with a soft brush & vacummed.
- 12. ClimaPlus™ 30 year limited system warranty. Contains a broad spectrum antimicrobial additive on the face and back of the panel that provides resistance against the growth of mold and mildew. Includes sag resistance performance.
- 13. Suspension Grid/Width: USG Donn DX; 15/16" (24mm).

2.4 GENERAL METAL SUSPENSION SYSTEMS

- A. Standard for Metal Suspension Systems: Provide metal suspension systems of type, structural classification and finish indicated which comply with applicable STM C 635 requirements.
- B. Finishes and Colors: Provide manufacturer's standard factory applied finish for type of system indicated. For exposed suspension members and accessories with painted finish, provide color

indicated or, if not otherwise indicated, as selected by Architect from manufacturer's full range of standard colors.

1. White.

- C. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung.
- D. Hanger Wire: Galvanized carbon steel wire, ASTM A 641, soft temper, prestretched, Class 1 coating, sized so that stress at 3- times hanger design load (ASTM C 635, Table 1, Direct Hung), will be less than yield stress of wire, but provide not less than 12 gage.
- E. Edge Moldings and Trim: Formed steel section; exposed surfaces prefinished to match suspension system components.
 - 1. Provide shadow molding for edges equal to MS174; 9/16" thick exposed flange; 3/8" x 3/8" reveal; 7/8" vertical flange.
 - 2. At penetrations of ceiling install manufacturer's standard molding which fits with type of edge detail and suspension system indicated.
 - 3. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
- F. Hold-Down/Impact Clips: Where indicated provide manufacturer's standard impact clip system design to absorb impact forces against lay-in panels. Install hold down clips at all ceiling panels within 10'-0" of and exterior door.

2.5 METAL SUSPENSION SYSTEMS

A. USG Donn Brand DX/DXL 15/16" Acoustical Suspension System

- 1. Narrow Face, Capped, Double Web, Cold Rolled Steel Suspension System: Main and Cross Tees as defined by ASTM C635, commercial quality pretreated and painted hot-dipped galvanized cold-rolled steel, exposed surfaces prefinished in manufacturer's standard corrosion resistant enamel paint finish
- 2. Structural Classification: Intermediate Duty.
- 3. Tee Profile: Narrow Face 15/16" (22mm) wide.
- 4. Color: White

2.6 SEALANT

- A. Acoustical Sealant: Resilient, non-staining, non-shrinking, non-hardening, non-skinning, non-drying, non-sag sealant intended for interior sealing of concealed construction joints.
- B. Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. BA-98; Pecora Corp.
 - 2. Tremco Acoustical Sealant; Tremco
 - 3. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to schedule bid opening.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordination: Furnish layouts for inserts, clips, or other supports required to be installed by other trades for support of acoustical ceilings.
 - 1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

- B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Coordinate ceiling layout with lighting layout. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans.

3.2 INSTALLATION

- A. General: Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire-resistance rating requirements as indicated, and Cisca standards applicable to work.
- B. Arrange acoustical units and orient directionally-patterned units (if any) in manner shown by reflected ceiling plans.
- C. Install suspension systems to comply with ASTM C 636, with hangers supported only from building structural members.
 - 1. Locate hangers within 6" inches from each end and spaced 4'-0" along each carrying channel or direct-hung runner, unless otherwise indicated, leveling to tolerance of 1/8" in 12'-0".
 - 2. Locate hangers on all 4 corners of the ceiling grid where a projector is installed
- D. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperature.
- E. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum which are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal force by bracing, counter-splaying or other equally effective means.
- F. Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units.
- G. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.
- H. Screw-attached moldings to substrate at intervals not over 16" o.c. and not more than 3" from ends, leveling with ceiling suspension system to tolerance of 1/8" in 12'-0". Miter corners accurately and connect securely.
- I. Install acoustical panels in coordination with suspension system with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.
- J. Install hold-down clips on panels, within 10'-0" of exterior door openings, where panels are other than horizontal, and in areas where required by governing regulations or for fire-resistance ratings; space as recommended by panel manufacturer, unless otherwise indicated or required.

3.3 EXTRA STOCK

- A. Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
 - 1. Ceiling Tile: Furnish not less than one box for each type, color, pattern and size installed.

END OF SECTION

SECTION 09650 - RUBBER BASE

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Extent of rubber base is shown on drawings and in schedules.

1.2 QUALITY ASSURANCE

- A. Manufacturer: Provide each type of rubber base as produced by a single manufacturer, including recommended, adhesives.
 - 1. Wherever possible, provide required rubber base produced by a single manufacturer.

1.3 SUBMITTALS

- A. Product Data: Submit 2 copies of manufacturer's technical data and installation instructions for each type of rubber base.
- B. Samples: Submit, for verification purposes, samples of each type, color, and pattern of rubber base,

1.4 JOB CONDITIONS

- A. Maintain minimum temperature of 65°F in spaces to receive rubber base for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Store rubber base materials in spaces where they will be installed for at least 48 hours before beginning installation. Subsequently, maintain minimum temperature of 55°F in areas where work is completed.
- B. Install after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Tarkett Flooring Company (Basis of Design)
 - 2. Flexco
 - 3. Roppe Corporation
- B. Equal products of other manufacturers may be used in the work provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS

- A. Colors and Patterns: As selected by Architect from manufacturer's standards.
- B. Wall Base: Provide rubber base complying with FS SS-W-40, Type II, with matching end stops and pre-formed or molded corner units and as follows:
 - 1. Height: 4"
 - 2. Thickness: 1/8"
 - 3. Style: Standard Top-Set Cove
 - 4. Finish: Matte

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with preformed corner units, or fabricated from base materials with mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.
 - 1. On masonry surfaces, or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
- B. Place resilient edge strips tightly butted to flooring and secure with adhesive. Install edging strips at edges of flooring which would otherwise be exposed.

3.2 CLEANING AND PROTECTION

- A. Remove any excess adhesive or other surface blemishes, using neutral type cleaners as recommended by flooring manufacturer. Protect installed flooring with heavy Kraft paper or other covering.
- B. Finishing: After completion of project and just prior to final inspection of work, thoroughly clean floors and accessories.
- C. Apply polish and buff, with type of polish, number of coats, and buffing procedures in compliance with flooring manufacturer's instructions.

END OF SECTION

SECTION 09651 – LUXURY VINYL TILE FLOORING (LVT)

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. Luxury Vinyl Tile flooring and accessories as indicated on drawings and in schedules.

1.2 RELATED REQUIREMENTS

- A. Section 09650 – Rubber Base.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Provide each type of Luxury Vinyl Tile flooring and accessories as produced by a single manufacturer, including recommended primers, adhesives, sealants and leveling compounds.
 - 1. Wherever possible, provide required Luxury Vinyl Tile flooring and accessories produced by a single manufacturer.

1.4 SUBMITTALS

- A. Product Data: Submit 2 copies of manufacturer's technical data and installation instructions for each type of Luxury Vinyl Tile flooring and accessory.
- B. Samples: Submit, for verification purposes, samples of each type, color, and pattern of Luxury Vinyl Tile, including accessories, required, indicating full range of color and pattern variation.

1.5 JOB CONDITIONS

- A. Store Luxury Vinyl Tile flooring products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by the manufacture, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).
- B. Maintain minimum temperature of 65°F in spaces to receive Luxury Vinyl Plank Tile flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Store Luxury Vinyl Tile materials in spaces where they will be installed for at least 48 hours before beginning installation.
- C. Maintain the ambient relative humidity between 40% and 60% during installation.
- D. Until Substantial Completion, maintain ambient temperatures within range recommended by the manufacture but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).
- E. Install Luxury Vinyl Tile flooring and accessories after other finishing operations, including painting, have been completed. Do not install Luxury Vinyl Tile Flooring over concrete slabs until the latter have been cured and are sufficiently dry to achieve bond with adhesive as determined by manufacturer's recommended bond and moisture test.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Tarkett; 3000 Aurora Road Solon, OH 44139; PH: 850-510-2721; E: jennifer.mitchell@tarkett.com; Website: [https:// commercial.tarkett.com/](https://commercial.tarkett.com/) (**Basis of Design**)
 - 2. Mannington Commercial, 1844 U.S. Highway 41 S.E. Calhoun, GA 30701; PH: 800.241.2262; www.manningtoncommercial.com.
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS

- A. LVT: "Spacia" Collection; "Abstract" Series

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1. Construction High Performance Luxury Vinyl Tile flooring
 2. Class / ASTM F 1700 Class III Printed Film Vinyl Tile, Type B (embossed)
 3. Wear layer Thickness 20 mil or 0.020" (0.5 mm) Quantum Guard Elite
 4. Overall Thickness 4.0 mm or nominal
 5. Nominal Dimensions: 4" wide x 36" long
 6. Backing Class Commercial Grade
 7. Installation Glue Down
 8. Slip Resistance / ASTM D 2047 >0.65 (wet/dry)
 9. Warranty: 15 year limited commercial wear warranty.
 10. Colors as selected by the Owner.
- B. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.
- C. Leveling Compound: ProSpec Feather Edge, premium, polymer modified, rapid setting, trowelable underlayment that results in a very smooth, ultra thin finish or as recommended by the flooring manufacture.
- D. Surfaces must be solid, completely clean, free of oil, gypsum compounds, wax, grease, sealers, curing compounds, asphalt, paint, dirt, loose surface material and any contaminants that act as a bond breaker. Weak concrete surfaces must be cleaned down to solid sound concrete by mechanical means. Acid etching or chemical cleaning is not acceptable. Remove all dirt by vacuuming. All subfloors must be clean, dry and at least 40° F (4° C) prior to applying ProSpec Feather Edge.
- E. Installation: ProSpec Feather Edge will accept standard floor coverings such as VCT, vinyl sheet goods, tile and carpeting in approximately 15-30 minutes after placement.
- F. Materials: Extruded rubber accessories as required (i.e. nosings, reducer strip.)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufactures written instructions to ensure adhesion of Luxury Vinyl Tile Flooring.
 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 2. Remove substrate paint, coatings and other substances that are incompatible with adhesives or contain soap, wax, oil, solvents, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 3. Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-permanent markers, pens, crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.
 4. Prepare Substrates according to ASTM F 710 including the following:

Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

- i. Perform anhydrous calcium chloride test, ASTM F 1869. Results must not exceed 5 lbs. Moisture Vapor Emission Rate per 1,000 sq. ft. in 24 hours.
- or**
- ii. Perform relative humidity test using in situ probes, ASTM F 2170. Results must not exceed 80%.
 - a. A pH test for alkalinity must be conducted. Results should range between 7 and 9. If the test results are not within the acceptable range of 7 to 9, the installation must not proceed until the problem has been corrected.
 - b. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
- B. Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- C. Floor covering shall not be installed over expansion joints.
- D. Do not install resilient products until they are the same temperature as the space where they are to be installed.
- E. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- F. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient tile flooring.
 1. Install with manufacturer's adhesive specified for the site conditions and follow adhesive label for proper use.
 2. Follow manufacturer's recommendation and lay tiles so graining follows the same direction.
 3. Roll the flooring in both directions using a 100 pound three-section roller.
- B. Lay tile from center marks established with principal walls, discounting minor offsets, so that tile at opposite edges of room area of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, from wall to wall and under all casework or other fixed equipment. Where construction joints in concrete slab occur, lay tile joint with construction joint.
- C. Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged if so numbered. Cut tile neatly around all fixtures. Broken, cracked, chipped, or deformed tiles are not acceptable.
 1. Lay each color of tile with grain running in basket weave pattern.
- D. Adhere tile flooring to substrates using full spread of adhesive applied in compliance with flooring manufacturer's directions.
- E. Accessories: Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with preformed corner units, or fabricated from base materials with mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.
 1. On masonry surfaces, or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
- F. Place resilient edge strips tightly butted to flooring and secure with adhesive. Install edging strips at edges of flooring which would otherwise be exposed.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.
- E. Cover resilient products until Substantial Completion.
- F. Wait 72 hours after installation before performing initial cleaning.
- G. A regular maintenance program must be started after the initial cleaning.

3.5 EXTRA STOCK

- A. Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
 - 1. Flooring: Furnish not less than one box for each type, color, pattern and size installed.

END OF SECTION

SECTION 09672 - RESINOUS FLOORING

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. This Section includes one resinous flooring system, one with epoxy body.
 - 1. Application Method: Squeegee, screed and broadcast.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.
- B. Samples for Verification: For each resinous flooring system required, 5 inches (150 mm) square, applied to a rigid backing.
- C. Product Schedule: Use resinous flooring designations indicated in Part 2 and room designations indicated on Drawings in product schedule.
- D. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- E. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. No request for substitution shall be considered that would change the generic type of floor system specified (i.e. epoxy based flake broadcast with urethane mortar base). Equivalent materials of other manufactures may be substituted only on approval of Architect or Engineer. Request for substitution will only be considered only if submitted 10 days prior to bid date. Request will be subject to specification requirements described in this section.
- B. Installer Qualifications: Engage an experienced installer (applicator) who is experienced in applying resinous flooring systems similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance, and who is acceptable to resinous flooring manufacturer.
 - 1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
 - 2. Contractor shall have completed at least 10 projects of similar size and complexity.
- C. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, through one source from a single manufacturer, with not less than ten years of successful experience in manufacturing and installing principal materials described in this section. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.
- D. Manufacturer Field Technical Service Representatives: Resinous flooring manufacture shall retain the services of Field Technical Service Representatives who are trained specifically on installing the system to be used on the project.
 - 1. Field Technical Services Representatives shall be employed by the system manufacture to assist in the quality assurance and quality control process of the installation and shall be available to perform field problem solving issues with the installer.
- E. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Apply full-thickness mockups on 48-inch- (1200-mm-) square floor area selected by Architect.
2. Include 48-inch (1200-mm) length of integral cove base.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Pre-installation Conference:

1. General contractor shall arrange a meeting not less than thirty days prior to starting work.
2. Attendance:
 - a. General Contractor
 - b. Architect/Owner's Representative.
 - c. Manufacturer/Installer's Representative.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.
- B. Store materials to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects. Store material per product data sheet.
- C. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
 1. Maintain material and substrate temperature between 65 and 85 deg F (18 and 30 deg C) during resinous flooring application and for not less than 24 hours after application.
- B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
- C. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application, unless manufacturer recommends a longer period.
- D. Concrete substrate shall be properly cured. A vapor barrier must be present for concrete subfloors on or below grade. Otherwise, an osmotic pressure resistant grout must be installed prior to the resinous flooring

1.7 WARRANTY

- A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of (1) one full year from date of installation, or provide a joint and several warranty signed on a single document by material manufacturer and applicator jointly and severally warranting the materials and workmanship for a period of (1) one full year from date of installation. A sample warranty letter must be included with bid package or bid may be disqualified.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 1. Stonhard, Inc.; Stontec ERF®. - Basls of Design.

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- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 RESINOUS FLOORING

- A. Products: Subject to compliance with requirements.
 - 1. Confirm inclusion of 25mil body coat, and broadcast quartz into primer increasing bond strength. Products that may be incorporated into the work include,
- B. Products: Subject to compliance with requirements:
 - 2. Stonhard, Inc.; Stontec ERF®. Basis of Design.
- C. System Characteristics:
 - 3. Color and Pattern: Select from manufactures standards
 - 4. Wearing Surface: Standard
 - 5. Integral Cove Base: TBD
 - 6. Overall System Thickness: 2mm
- D. System Components: Manufacturer's standard components that are compatible with each other and as follows:
 - 7. Primer:
 - a. Material Basis: Stonhard Standard Primer
 - b. Resin: Epoxy
 - c. Formulation Description: (2) two component 100 percent solids.
 - d. Application Method: Squeegee and roller.
 - e. Number of Coats: (1) one.
 - f. Aggregates: Broadcast quartz into wet primer coat.
 - 8. Body Coat(s):
 - a. Material Basis: Stonshield Undercoat.
 - b. Resin: Epoxy.
 - c. Formulation Description: (3) three component solvent free epoxy.
 - d. Application Method: Notched squeegee.
 - 1) Thickness of Coats: 25-30 mils with standard primer coat
 - 2) Number of Coats: (1) One.
 - 9. Broadcast:
 - a. Material Basis: Stontec Flakes
 - b. Formulation Description: Decorative flake (1/16" or 1/4)
 - c. Type: Tweed (chips to be mixed in Mfg. facility)
 - d. Finish: Broadcast to rejection.
 - e. Number of Coats: one.
 - 10. Topcoat:
 - a. Material Basis: Stonkote CE4
 - b. Resin: Epoxy.
 - c. Formulation Description: (2) component, UV stable, solvent free epoxy.

- d. Type: Clear.
 - e. Finish: Gloss. (see finish schedule for texture options)
 - f. Number of Coats: Two.
- E. Note: Components listed above are the basis of design intent; all bids will be compared to this standard including resin chemistry, color, wearing surface, thickness, and installation procedures, including number of coats. Contractor shall be required to comply with all the requirements of the Specifications and all of the components required by the Specifications, whether or not such products are specifically listed above.
- F. SYSTEM PHYSICAL PROPERTIES
- 1. Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:
 - a. Tensile Strength: 5,200 psi per ASTM D-638
 - b. Flexural Strength: 4,000 psi per ASTM D-790
 - c. Flexural Modulus of Elasticity: 1.7×10^6 psi per ASTM D-790
 - d. Hardness: .85 to .90 per ASTM D-2240, Shore D
 - e. Linear Coefficient of Thermal Expansion: 17×10^{-6} in./in. °F per ASTM C-531
 - f. Impact Resistance: Exceeds 160 in.-lbs. per ASTM D-4060, CS-17
 - g. Abrasion Resistance: 0.03 gm max. weight loss per ASTM D-4060, CS-17
 - h. Flammability: Class I per ASTM E-648

2.3 ACCESSORY MATERIALS

- A. Patching, Leveling and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated. No Single component or cementitious materials.
- B. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated.

PART 3 – EXECUTION

3.1 PREPARATION

- A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean and dry substrate for resinous flooring application.
- B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
 - 1. Mechanically prepare substrates as follows:
 - a. Mechanically prepare with the use of Diamond grinding equipment to provide surface sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring. Or,
 - b. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup or Diamond Grind with a dust free system.
 - c. Comply with ASTM C 811 requirements, unless manufacturer's written instructions are more stringent.

2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
3. Verify that concrete substrates meet the following requirements.
 - a. Perform in situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 80 percent.
 - b. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. of slab in 24 hours.
- C. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions. Resinous materials only.
- D. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations.

3.2 APPLICATION

- A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
 2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
 3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.
 - a. Apply joint sealant to comply with manufacturer's written recommendations.
- B. Mix and apply primer over properly prepared substrate with strict adherence to manufacturer's installation procedures and coverage rates
- C. Broadcast: Immediately broadcast quartz silica aggregate into the primer using manufacturer's specially designed spray caster. Strict adherence to manufacturer's installation procedures and coverage rates is imperative.
- D. Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, and top coating of cove base. Round internal and external corners. Refer to detail drawings.
- E. Body coat: Mix base material according to manufacturer's recommended procedures. Uniformly spread mixed material over previously primed substrate using manufacturer's installation tool. Roll material with strict adherence to manufacturer's installation procedures and coverage rates.
- F. Broadcast: Immediately broadcast decorative flakes into the body coat. Strict adherence to manufacturer's installation procedures and coverage rates is imperative.
- G. First Sealer: Remove excess un-bonded flakes by lightly brushing and vacuuming the floor surface. Mix and apply sealer with strict adherence to manufacturer's installation procedures.
- H. Second sealer: Lightly sand first sealer coat. Mix and apply second sealer coat with strict adherence to manufacturer's installation procedures.

3.3 TERMINATIONS

- A. Chase edges to "lock" the coating system into the concrete substrate along lines of termination.
- B. Penetration Treatment: Lap and seal coating onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.
- C. Trenches: Continue coating system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks.

- D. Treat floor drains by chasing the coating to lock in place at point of termination.

3.4 JOINTS AND CRACKS

- A. Treat control joints to bridge potential cracks and to maintain monolithic protection.
- B. Treat cold joints and construction joints and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.
- C. Vertical and horizontal contraction and expansion joints are treated by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered.

3.5 FIELD QUALITY CONTROL

- A. Material Sampling: Owner may at any time and any numbers of times during resinous flooring application require material samples for testing for compliance with requirements.
 - 1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
 - 3. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.

3.6 CLEANING, PROTECTING, AND CURING

- A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.
- B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.
- C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer. General Contractor is responsible for cleaning prior to inspection.

END OF SECTION

SECTION 09680 – CARPETING

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 RELATED SECTIONS

- A. Section 09650 – Rubber Base.

1.3 DESCRIPTION OF WORK

- A. The extent of each type of carpeting is indicated on the drawings, and by specifications, and is defined to include carpet and accessories.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each type of carpet specified.
- B. Shop Drawings: Submit shop drawings indicating seam layout for approval by Architect.

1.5 QUALITY ASSURANCE

- A. Installer: Firm with not less than 5 years of carpeting experience, similar to work of this section.
- B. Manufacturer: Firm (Carpet Mill) with not less than 5 years of production experience with carpet similar to types specified in this section, and whose published product literature clearly indicates compliance of products with requirements of this section.
- C. General Standard: "Carpet Specifier's Handbook" by the Carpet and Rug Institute; comply with recommendations which can be reasonably applied to types of carpeting work required.
- D. Maintenance Materials: Deliver specified overrun (if any) and usable scraps of carpet to Owner's designated storage space, properly packaged (paper wrapped) and identified. Usable scraps are defined to include roll ends of less than 9'0" length, and pieces of more than 3 sq. ft. area and more than 8" wide. Dispose of smaller pieces.

1.6 PRODUCT DELIVERY AND STORAGE

- A. Deliver carpeting material in protective wrapping, and store inside, protected from weather, moisture and soiling.

1.7 WARRANTY

- A. Provide special project warranty, signed by the Contractor, Installer and Manufacturer (Carpet Mill), agreeing to repair or replace defective materials and workmanship of carpeting work during a 1 year warranty period from date of final acceptance of the project. Attach copies of product warranties.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Mohawk (Basis of Design)
 - 2. Milliken
 - 3. Mannington

2.2 MATERIALS

- A. Series: "Hyper Earth" – 12BY36; 12" x 36" carpet planks.
- B. Color: To be selected by Architect from Series color selections.

2.3 PERFORMANCE

- A. Permanent Static Protection: Dissipates unwanted static electricity and effectively prevents static build-up in excess of 3.0 KV at 70° F, 20% relative humidity when tested under AATC-134-75.
- B. Flammability: DOC-FF-1-70 Pill Test passes. Floor Radiant Panel meets NFPA Class 1 when tested under ASTM E648 Glue Down. NBS Smoke Chamber NFPA-258 (450 or less) Flaming Mode.
- C. Construction Materials: 100% man-made materials for superior stability. Specifications are subject to change without notice when such changes do not alter product performance. Slight color variations may occur from dye lot to dye lot.

2.4 CARPET ACCESSORIES

- A. Wall Base: See Section 09650 – Rubber Base.
- B. Carpet Edge Guard, Metallic: Color as selected by Architect.
- C. Reducer Strip: Install vinyl reducer strip where carpet meets other finishes.
- D. Installation Adhesive: Water-resistant type as recommended by carpet or cushion manufacturer, and which complies with flammability requirements for installed carpet.
- E. Seaming Cement: Hot-melt seaming adhesive or similar product recommended by carpet manufacturer, for taping seams and buttering cut edges at backing to form secure seams and prevent pile loss at seams.
- F. Miscellaneous Materials: As recommended by manufacturers of carpet, cushions and other carpeting products; and selected by Installer to meet project circumstances and requirements.

PART 3 – EXECUTION

3.1 PRE-INSTALLATION REQUIREMENTS

- A. Installer must examine substrates for moisture content and other conditions under which carpeting is to be installed, including the temperature of the area that the carpet is to be installed in, and notify Contractor in writing of conditions detrimental to proper completion of the work. Do not proceed until satisfactory conditions have been met.
- B. Sequence carpeting with other work so far as to minimize the possibility of damage and soiling of carpet during remainder of construction period.

3.2 INSTALLATION- GENERAL

- A. Comply with manufacturers' instructions and recommendations for seam locations and direction of carpet; maintain uniformity of direction and lay of pile. At doors, center seams under doors; do not place seams in traffic direction at doorways. Provide seam layout to Architect for approval before any work is performed.
- B. Extend carpet under open-bottomed obstructions and under removable flanges and furnishings, and into alcoves and closets of each space.
- C. Provide cut-outs where required, and bind cut edges properly where not concealed by protective edge guards or overlapping flanges.
- D. Install carpet edge guard where edge of carpet is exposed; anchor guard to substrate.

3.3 GLUE-DOWN INSTALLATION

- A. Fit sections of carpets into each space prior to application of adhesive. Trim edges and butter cuts with seaming cement.
- B. Apply adhesive uniformly to substrate in accordance with manufacturers' instructions. Butt carpet edges tightly together to form seams without gaps. Roll lightly to eliminate air pockets and ensure uniform bond. Remove adhesive promptly from face of carpet.
- C. All seams are to be sealed or bonded together with the manufacturer's approved product and method.

3.4 CLEANING AND PROTECTION

- A. Remove debris, sorting pieces to be saved from scraps to be disposed of.
- B. Vacuum carpet using commercial machine with face-beater element. Remove spots and replace carpet where spots cannot be removed.
- C. Advise Contractor of protection methods and materials needed to ensure that carpeting will be without deterioration or damage at time of substantial completion.

END OF SECTION

SECTION 09900 - PAINTING

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. Extent of painting work is indicated on drawings and schedules, and as herein specified including accent painting.
- B. Work includes painting and finishing of interior and exterior exposed items and surfaces throughout project, except as otherwise indicated.
 - 1. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatments specified under other sections of work.
- C. Work includes field painting of exposed bare and covered pipes, conduits and ducts (including color coding), and of hangers, exposed steel and iron work, and conduits and primed metal surfaces of equipment installed under mechanical and electrical work, except as otherwise indicated.
- D. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
- E. Surfaces to be Painted: Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces whether or not colors are designated in "schedules". Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, Architect will select these from standard colors or finishes available.
- F. Following categories of work are not included as part of field-applied finish work.
 - 1. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer finishing is specified for such items as (but not limited to) metal toilet enclosures, prefinished partition systems, acoustic materials, elevator entrance doors and frames, elevator equipment, and finished mechanical and electrical equipment, including light fixtures, switchgear and distribution cabinets.
 - 2. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.
 - 3. Finished Metal Surfaces: Unless otherwise indicated, metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting.
 - 4. Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting.
- G. Following categories of work are included under other sections of these specifications.
 - 1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under various sections for structural steel, metal fabrications, hollow metal work and similar items.
 - 2. Unless otherwise specified, shop priming of fabricated components such as shop-fabricated or factory-built mechanical and electrical equipment or accessories is included under other sections of these specifications.

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- H. Do not paint over any code-required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer and use only within recommended limits.
- B. Coordination of Work: Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.
- B. Samples: Prior to beginning work, Architect will furnish color chips for surfaces to be painted. Use representative colors when preparing samples for review. Submit samples for Architect's re- view of color and texture only.
- C. Provide a listing of material and application for each coat of each finish sample. Provide a 4' x 4' sample application of each color paint for Architect's approval prior to final ordering of product. Sample application shall be applied in an inconspicuous place, satisfactory to the Architect.

1.5 DELIVERY AND STORAGE

- A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:
 - 1. Name or title of material.
 - 2. Fed. Spec. number, if applicable.
 - 3. Manufacturer's stock number and date of manufacturer.
 - 4. Manufacturer's name.
 - 5. Contents by volume, for major pigment and vehicle constituents.
 - 6. Thinning instructions.
 - 7. Application instructions.
 - 8. Color name and number.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
 - 1. Protect from freezing where necessary. Keep storage area neat and orderly. Remove oily rags and waste daily. Take all precautions to ensure that workmen and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.

1.6 JOB CONDITIONS

- A. Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 degree F and 90 degrees F, unless otherwise permitted by paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 degree F and 95 degree F, unless otherwise permitted by paint manufacturer's printed instructions.
- C. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85% or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions.

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1. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturers are listed as acceptable substitutions to the establish minimum standards. Sherwin Williams Products are listed as the standard of product performance and quality.
 1. Sherwin Williams Paint Company (SW)
 2. Benjamin Moore and Co. (Moore).
 3. Pittsburgh Paints (PPG).
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS

- A. Material Quality: Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.
 1. Proprietary names used to designate colors or materials are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.
 2. Federal Specifications establish minimum acceptable quality for paint materials. Provide written certification from paint manufacturer that materials provided meet or exceed these minimums.
 3. Manufacturer's products which comply with coating qualitative requirements of applicable Federal Specifications, yet differ in quantitative requirements, may be considered for use when acceptable to Architect. Furnish material data and manufacturer's certificate of performance to Architect for any proposed substitutions.
- B. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

PART 3 – EXECUTION

3.1 INSPECTION

- A. **Applicator must examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Applicator. If work is begun before satisfactory conditions are met, then it shall be the Applicators' responsibility for the finish surfaces conditions.**
- B. Starting of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.
- C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

3.2 SURFACE PREPARATION

- A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.
 1. Provide barrier coats over incompatible primers or remove and reprime as required. Notify Architect in writing of any anticipated problems in using the specified coating systems with substrates primed by others.

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2. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.
 3. Contractor MUST remove ALL foreign matter/material not pertinent to new paint from all surfaces before application of any new paint. Foreign matter/material includes, but is not limited to, flaking paint, tape, tacks, nails, poster gum, adhesives of any kind etc.
 4. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.
- B. Cementitious Materials: Prepare cementitious surfaces of concrete, concrete block, cement plaster and cement-asbestos board to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze.
1. Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application of paint. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
 2. Clean concrete floor surfaces scheduled to be painted with a commercial solution of muriatic acid, or other etching cleaner. Flush floor with clean water to neutralize acid and allow to dry before painting.
- C. Wood: Clean wood surfaces to be painted of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.
1. Prime, stain, or seal wood required to be job-painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood, including cabinets, counters, cases, paneling.
 2. When transparent finish is required, use spar varnish for backpriming.
 3. Backprime all exposed exterior wood. Backprime paneling on interior partitions only where masonry, plaster, or other wet wall construction occurs on backside.
 4. Seal tops, bottoms, and cut-outs of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.
- D. Ferrous Metals: Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.
1. Touch-up shop-applied prime coats wherever damaged or bare. Clean and touch-up with same type shop primer.
- E. Galvanized Surfaces: Clean free of oil and surface contaminants with non-petroleum based solvent.

3.3 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density and stir as required during application. Do not stir surface film into material. If film exists, remove film and strain paint material.

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3.4 APPLICATION

- A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied. Paint colors, surface treatments, and finishes, are indicated in "schedules" of the contract documents.
 - 1. Provide finish coats which are compatible with prime paints used.
 - 2. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness not less than specified thickness.
 - 3. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.
 - 4. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
 - 5. Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.
 - 6. Finish exterior doors on tops, bottoms and side edges same as exterior faces, unless otherwise indicated.
 - 7. Sand lightly between each succeeding enamel or varnish coat.
 - 8. Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.
- B. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 - 1. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss adhesion of the undercoat.
- C. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.
- D. Prime Coats: Apply prime coat where required to be painted or finished, and which has not been primed coated by others.
 - 1. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
- E. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.
- F. Transparent (Clear) Finishes: Use multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.
 - 1. Provide satin finish for final coats, unless otherwise indicated.
- G. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

3.5 FIELD QUALITY CONTROL

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- A. The right is reserved by Owner to invoke the following material testing procedure at any time, and any number of times during period of field painting:
 - 1. Engage services of an independent testing laboratory to sample paint being used. Samples of materials delivered to project site will be taken, identified and sealed, and certified in presence of Contractor.
 - 2. Testing laboratory will perform appropriate tests for any or all of following characteristics: Abrasion resistance, apparent reflectivity, flexibility, washability, absorption, accelerated weathering, dry opacity, accelerated yellowness, recoating, skinning, color retention, alkali resistance and quantitative materials analysis.
- B. If test results show that material being used does not comply with specified requirements, Contractor may be directed to stop painting work, and remove non-complying paint; pay for testing; repaint surfaces coated with rejected paint; remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are non-compatible.

3.6 CLEAN-UP AND PROTECTION

- A. Clean-Up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each day.
- B. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
 - 1. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
- D. At completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

3.7 EXTRA STOCK

- A. Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
 - 1. Paint: Furnish not less than one gallon for each type and color, applied.

3.8 EXTERIOR PAINT SCHEDULE

A. GENERAL

- 1. Paint all new roof penetrations at roof areas, including roof attic ventilators and exhaust fan housings.
- 2. General: Provide the following paint systems for the various substrates, as indicated.

B. EXTERIOR METALS

- 1. Zinc-Coated Metal.
 - a. Alkyd Gloss Enamel Finish.
 - i. 2 Coats over primer, with total dry film thickness not less than 2.5 mils.
 - ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat).
 - iii. 2nd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series.
 - iv. 3rd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series, (2-4 mils dry per coat).

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2. Ferrous Metal.

- a. Alkyd Gloss Enamel Finish.
 - i. 2 Finish Coats over primer, with total dry film thickness not less than 6.0 mils.
 - ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat).
 - iii. 2nd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series.
 - iv. 3rd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series, (2-4 mils dry per coat).

C. EXTERIOR CMU

1. Masonry Materials

- a. Elastomeric Paint Finish.
 - i. Prepare surface
 - ii. Apply masonry bonding and primer.
 - iii. Complete and apply painting coat
 - a. 2 Finish Coats over primer, with total dry film thickness not less than 6.0 mils
 - i. 1st Coat: Exterior Elastomeric Masonry & Brick SikaWall-4090 Acrylic (9.0-9.5 mils wet, 16 mils dry per coat).
 - ii. 2nd Coat: Exterior Elastomeric Masonry & Brick SikaWall-4090 Acrylic
 - iii. 3rd Coat: Exterior Elastomeric Masonry & Brick SikaWall-4090 Acrylic

3.9 INTERIOR PAINT SCHEDULE

A. GENERAL

- 1. Provide the following paint systems for the various substrates, as indicated on drawings, schedules and specifications.
- 2. Paint all exposed metals (steel framing, mechanical ducts, conduit, etc.) unless otherwise indicated on drawings.
- 3. Painter shall identify all fire and smoke partitions above lay in ceilings as follows: Wording shall be "FIRE AND SMOKE BARRIERS - PROTECT ALL OPENINGS" (4" high), to be applied every 8'- 0" on center.

B. INTERIOR METALS

- 1. Structural Steel / Metal Building Components.
 - a. Epoxy Egshel Finish.
 - i. 2 coats over primer with total dry film thickness not less than 6.0 mils.
 - ii. 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66W01310 (5 – 10 mils wet, 1.9 – 3.8 mils dry per coat).
 - iii. 2nd Coat: S-W Pro Industrial Waterbased Catalyzed Epoxy EgShel Finish, B73-360 Series (5.0 – 12.0 mils wet, 2.0 – 5.0 mils dry per coat).
 - iv. 3rd Coat: S-W Pro Industrial Waterbased Catalyzed Epoxy EgShel Finish, B73-360 Series (5.0 – 12.0 mils wet, 2.0 – 5.0 mils dry per coat).
- 2. Zinc-Coated Metal
 - a. Alkyd Gloss Enamel Finish.

- i. 2 Coats over primer, with total dry film thickness not less than 6.0 mils.
- ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat) .
- iii. 2nd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series.
- iv. 3rd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series, (2-4 mils dry per coat).

3. Ferrous Metal

- a. Alkyd Gloss Enamel Finish.
 - i. 2 Finish Coats over primer, with total dry film thickness not less than 6.0 mils.
 - ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat).
 - iii. 2nd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series.
 - iv. 3rd Coat: S-W Industrial Enamel, Gloss Finish, B54 Series, (2-4 mils dry per coat).
- b. (*Contractor Option*) Waterbased Alkyd Gloss Enamel Finish..
 - i. 2 Finish Coats over primer, with total dry film thickness not less than 6.0 mils.
 - ii. 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Acrylic Primer, B66-01310 Series (5.0-10.0 mils wet, 1.9-3.8 mils dry per coat).
 - iii. 2nd Coat: S-W Pro Industrial Waterbased Alkyd Urethane Enamel, Gloss Finish, B53 Series.
 - iv. 3rd Coat: S-W Pro Industrial Water-based Alkyd Urethane Enamel, Gloss Finish, B53 Series, (1.4 – 1.7 mils dry per coat).

C. INTERIOR MASONRY UNITS

- 1. Existing Concrete Masonry Units (CMU).
 - a. If existing concrete block walls are covered with an enamel paint finish, the following shall be used:
 - i. 1st Coat: S-W Extreme Bond Primer, B51W00150 (3.1 mils wet, .9 mils dry).
 - ii. 2nd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31W12651 Series.
 - iii. 3rd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31W12651 Series (4 mils wet, 1.5 mils dry per coat) .
 - b. If the existing concrete block walls are covered with a latex paint finish, the following shall be used:
 - i. 1st Coat: S-W ProMar 200 Zero VOC Latex Primer, B28W02600 (4 mils wet, 1.0 mils dry).
 - ii. 2nd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31W12651 Series.
 - iii. 3rd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31W12651 Series (4 mils wet, 1.5 mils dry per coat).

D. INTERIOR WOODWORK

- 1. Painted Woodwork.
 - a. Interior Semi-Gloss Acrylic Latex with dry film thickness not less than 3.8 mils.
 - i. 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W02600 (4 mils wet, 1.0 mils dry).

- ii. 2nd Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss Finish, B31W02651 Series.
 - iii. 3rd Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss Finish, B31W02651 Series (4 mils wet, 1.5 mils dry per coat).
- 2. Stained Woodwork
 - a. Stained Varnish Rubbed Finish: 3 Finish Coats over stain plus filler on open grain wood.
 - i. 1st Coat: S-W MinWax Performance Series Tintable Interior Stain 550 VOC, (450-550 sq ft/gal) Available in 250 VOC Version.
 - ii. 2nd Coat: S-W MinWax Performance Series Fast-Dry Varnish.
 - iii. 3rd Coat: S-W MinWax Performance Series Fast-Dry Varnish (600-700 sq ft/gal) (available in Gloss, Semi-Gloss, Satin)

END OF SECTION

SECTION 10160 - TOILET PARTITIONS

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. Extent of toilet partitions is indicated on drawings.
- B. Types of toilet partitions and screens required include the following:
 - 1. Solid phenolic with fused surface laminate, floor-supported, overhead-braced.
- C. Toilet accessories are specified elsewhere in Division 10.

1.3 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to ensure proper fitting of work. However, allow for adjustments within specified tolerances wherever taking of field measurements before fabrication might delay work.
- B. Coordination: Furnish inserts and anchorages which must be built into other work for installation of toilet partitions and related work; coordinate delivery with other work to avoid delay.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of toilet partition assemblies not fully described by product drawings, templates, and instructions for installation of anchorage devices built into other work.
- C. Samples: Submit full range of color samples for each type of unit required. Submit 6" square samples of each color and finish on same substrate to be used in work, for color selections.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Bobrick Washroom Equipment, Inc, 200 Commerce Drive, Clifton Park NY 12065-1350; Ph.: 518.877.7444; www.bobrick.com.
 - 2. General Partitions Mfg. Corp., 1702 Peninsula Drive, Erie, PA 16505-4243; Ph.: 814.833.1154; www.generalpartitions.com.
 - 3. ASI Global Partitions; 900 Clary Connector, Eastonollee, GA 30538; Ph.: 706.827.2700; www.asi-globalpartitions.com.
 - 4. ASI Accurate Partitions; 160 Tower Drive; Burr Ridge, IL 60527; Phone: 708.442.6800; www.asi-accuratepartitions.com.
 - 5. Bradley Partitions; W142N9101 Fountain Boulevard, Menomonee Falls, WI 53051; Ph.: 1.800.272.3539; www.bradleycorp.com.
 - 6. PSiSC - A Division of CSiSC; 9031 Farrow Road, Columbia, SC 29203; Ph.: 803.252.3020 Extension 106; www.psisc.com.
 - 7. Metpar; 95 State Street, Westbury, NY 11590; Ph: 516.333.2600; www.metpar.com.
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS

- A. General: Provide materials which have been selected for surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections on finished units are not acceptable.
- B. Materials: Doors, panels and pilasters are composed of compressed cellulose fibers impregnated with resins. The surface laminate is fused to the resin-impregnated core. All edges are machined and finished smooth with beveled edge. Material will not delaminate even under extreme conditions. Materials are non-absorbent, impact and graffiti resistant. Materials are impervious to steam, soaps and detergents and will not mildew.
- C. Panels: Shall be 1/2" thick with eased edges uniformly machined to a 1/16" radius. Panels are 58" high and anchored to walls with 18 gauge stainless steel continuous brackets and continuous stainless steel brackets at panel to pilaster locations.
- D. Doors: Shall be 3/4" thick with eased edges uniformly machined to a 1/16" radius. Doors are 58" high and mounted to pilasters with continuous stainless steel surface mounted hinge. Pre-threaded inserts are to be provided for all door hardware. Each door is furnished with one coat hook/bumper, slide latches, stops and pulls (for outswing doors) to be made of stainless steel. Door hardware shall allow for lift up emergency access.
- E. Pilasters: Shall be 3/4" thick with eased edges uniformly machined to a 1/16" radius. Pilasters are 83" high (or as indicated on the drawings) and anchored to panels and walls with continuous stainless steel brackets. The pilasters contain no less than two level adjusting bolts on the bottom and attach to the floor with two 3/4" expansion bolts and are braced at the top with aluminum headrail.
- F. Stainless Steel Pilaster Shoes: Shall be 3" high, and constructed of 20-gauge stainless steel. Pilaster shoes are bolted onto pilaster with stainless steel, tamper resistant sex bolts and screws.
- G. Latches and Keepers: Shall be fabricated from stainless steel with a satin finish. Latch is mounted onto door with 1/4" stainless steel torx head bolts pre-threaded inserts and acts as the stop for inswing doors. Keepers are mounted on the pilasters with stainless steel toex head screws.
- H. Headrail: Shall be made of heavy-duty extruded aluminum (6463-T5 alloy) with bright-dip anodized finish. Headrail is anti-grip and attaches to the top of the pilasters with stainless steel, tamper resistant torx screws. Headrail is attached to the adjacent wall construction with a stainless steel headrail bracket.
- I. Headrail Bracket: Shall be made of 16 gauge stainless steel and is attached to the adjacent wall construction with #14 x 1 1/2" stainless steel phillips-head screws and plastic anchors.
- J. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel with pinhead, torx screws and bolts.

2.3 FABRICATION

- A. General: Furnish standard doors, panels, screens, and pilasters fabricated for partition system, unless otherwise indicated. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.
- B. Door Dimensions: Unless otherwise indicated, furnish 24" wide inswinging doors for ordinary toilet stalls and 32" wide (clear opening) outswinging doors at stalls equipped for use by handicapped.
- C. Overhead-Braced Partitions: Furnish stainless steel supports and leveling bolts at pilasters, as recommended by manufacturer to suit floor conditions. Make provisions for setting and securing continuous aluminum overhead-bracing tube at top of each pilaster. Furnish shoe at each pilaster to conceal supports and leveling mechanism.
- D. Floor-Supported Partitions: furnish galvanized steel anchorage devices, complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters, to permit structural connection at floor. Furnish shoe at each pilaster to conceal anchorage.

- E. Floor-Supported Over-Head Braced Screens: Furnish pilasters not less than 3/4" in thickness, panels and pilasters of same construction and finish as toilet partitions. Furnish galvanized steel anchorage devices, complete with threaded rods, lock washers, and leveling adjusting nuts at pilasters, to permit structural connection to floor. Furnish shoe at pilaster to conceal anchorage.
- F. Accessories: Furnish units with chromium-plated finish, unless otherwise indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's recommended procedures and installation sequences. Install partitions rigid, straight, plumb, and level.
- B. Provide clearances of not more than 1/2" between pilasters and panels, and not more than 1" between panels and walls. Secure panels to walls with full length stainless steel brackets. Secure panels to pilasters with not less than two stirrup brackets located to align with stirrup brackets at wall. Secure panels in position with manufacturer's recommended anchoring devices.
- C. Overhead-Braced Partitions and Screens: Secure pilasters to floor and level, plumb, and tighten installation with devices furnished. Secure overhead-brace to each pilaster with not less than two fasteners. Hang doors and adjust so that tops of doors are parallel with overhead-brace when doors are in closed position.
- D. Floor-Supported Partitions: Set pilaster units with anchorages having not less than 2" penetration into structural floor, unless otherwise recommended by partition manufacturer. Level, plumb and tighten installation with devices furnished. Hang doors and adjust so that tops of doors are level with tops partition when doors are in closed position.
- E. Screens: Attach with concealed anchoring devices, as recommended by manufacturer to suit supporting structure. Set units to provide support and to resist lateral impact.
- F. Accessories: Mount accessories to partition units in accordance with manufacturer's instructions.

3.2 ADJUST AND CLEAN

- A. Hardware Adjustment: Adjust and lubricate hardware for proper operation. Set hinges on inswinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on outswinging doors (and entrance swing doors) to return to fully closed position.
- B. Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer and provide protection as necessary to prevent damage during remainder of construction period.

END OF SECTION

SECTION 10200 – LOUVERS

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. Extent of louvers and vents is indicated on drawings, including indications of sizes and locations.
 - 1. Fixed Wall Louvers.

1.3 DEFINITIONS:

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Horizontal Louver: Louver with horizontal blades; i.e., the axes of the blades are horizontal.
- C. Vertical Louver: Louver with vertical blades; i.e., the axes of the blades are vertical.
- D. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.
- E. Rain-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.

1.4 SUBMITTALS:

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets for each product and assembly specified.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Cleaning methods.
- C. Shop Drawings: For units and accessories. Include plans; elevations; sections; and details showing profiles, angles, and spacing of elements. Show unit dimensions related to wall openings and adjacent construction; free area for each size indicated for louvers; profiles of frames at jambs, heads, and sills; and anchorage details and locations.
 - 1. Verify openings by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 2. For installed products indicated to comply with design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Product Certificates:
 - 1. Air Performance: Certificates signed by Air Movement and Control Association International Inc (AMCA) certifying that the manufacturer's stock units are tested in accordance with AMCA Standard 500 and are licensed to bear the AMCA Certified Ratings Seal in accordance with AMCA Standard 511.
 - 2. Water Penetration: Certificates signed by Air Movement and Control Association International Inc (AMCA) certifying that the manufacturer's stock units are tested in accordance with AMCA Standard 500 and are licensed to bear the AMCA Certified Ratings Seal in accordance with AMCA Standard 511.
 - 3. Weather Louver Effectiveness: Certificates signed by Air Movement and Control Association International Inc (AMCA) certifying that the manufacturer's stock units are tested in accordance with AMCA Standard 500-L99, Section 8.3.2 - Wind Driven Rain Water Penetration Test, and are licensed to bear the AMCA Certified Ratings Seal in accordance with AMCA Standard 511.
 - 4. Provide AMCA Certification - Water, Air for louvers as scheduled.

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- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- F. Selection Samples: Two complete color charts showing the full range of colors available for units with factory-applied color finishes.
- G. Samples for Verification: For each finish specified, two samples representing actual finishes specified; prepared on Samples of same thickness and material indicated for final Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.

1.5 QUALITY ASSURANCE:

- A. Manufacturer Qualifications: Minimum 5 years manufacturing similar products. The manufacturer shall have implemented a program for the management of quality objectives, continual improvement, and monitoring of customer satisfaction to assure that customer needs and expectations are met.
- B. Installer Qualifications: Minimum 2 years experience installing similar louvers.
- C. Professional Engineer Qualifications: A professional engineer legally qualified to practice in jurisdiction where Project is located and experienced in providing engineering services of kind indicated. Engineering services are defined as those performed for installations of products that are similar to those indicated for this Project in material, design, and extent.
- D. Source Limitations: Obtain products through one source from a single manufacturer where alike in one or more respects regarding type, design, or factory-applied color finish.
- E. Welding Standards: As follows:
 - 1. Comply with AWS D1.2, "Structural Welding Code - Aluminum."
 - 2. Comply with AWS D1.3, "Structural Welding Code - Sheet Steel."
- F. AMCA Standard 500-L: Air performance, water penetration and air leakage ratings shall be determined in accordance with Air Movement and Control Association International Inc (AMCA) Standard 500, "Laboratory Methods of Testing Louvers for Rating."
- G. SMACNA Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" recommendations for fabrication, construction details, and installation procedures.

1.6 SEQUENCING AND SCHEDULING

- A. Field Measurements: Verify openings and adjacent construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating products without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to established dimensions.
 - 2. Coordinate Setting Drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.8 WARRANTY

- A. Manufacturer shall provide standard limited warranty for louver systems for a period of five years (60 months) from date of installation, no more than 60 months after shipment from manufacturing

plant. When notified in writing from the Owner of a manufacturing defect, manufacturer shall promptly correct deficiencies without direct financial cost to the Owner.

- B. Manufacturer shall provide 20 year limited warranty for fluoropolymer-based finish on extruded aluminum substrates.
 - 1. Finish coating shall not peel, blister, chip, crack or check.
 - 2. Chalking, fading or erosion of finish when measured by the following tests:
 - a. Finish coating shall not chalk in excess of 8 numerical ratings when measured in accordance with ASTM D4214.
 - b. Finish coating shall not change color or fade in excess of 5 NBS units as determined by ASTM D2244 and ASTM D822.
 - c. Finish coating shall not erode at a rate in excess of 10%/ 5 year as determined by Florida test sample.
- C. Manufacturer shall provide a 5 year limited warranty for Class I and a 3 year limited warranty for Class II anodized finish on extruded aluminum substrates.
 - 1. Seller warrants the Finish under normal atmospheric conditions.
 - a. Will not crack, craze, flake or blister
 - b. Will not change or fade more than (5) Delta-E Hunter units as determined by ASTM method D-2244
 - c. Will not chalk in excess of ASTM D-4214-07 number (8) rating, determined by the procedure outlined in ASTM D-4214-07 specification test.
 - 2. Any forming or welding must be done prior to finishing. Post forming or welding will void the warranty.
 - 3. This Warranty applies only if the anodized aluminum product is installed in strict accordance with Seller's recommended practices and maintained in accordance with AAMA (American Architectural Manufacturers Association) publication number 609 and 610-09 ("Cleaning and Maintenance Guide for Architecturally Finished Aluminum").

PART 2 – PRODUCTS

2.1 MANUFACTURERS:

- A. The following manufacturers' products have been used to established minimum standards for materials, workmanship and functions:
 - 1. Reliable Architectural Products (Basis of Design) |1300 Enterprise Road, Geneva, Alabama 36340 | PH: 334.684.3621 or 800.624.3914 | www.reliablelouvers.com,
 - 2. Ruskin Company | 3900 Dr. Greaves Rd. Grandview, MO 64030 | PH: 816.761.7476 | www.ruskin.com.
 - 3. The Airolite Company, LLC. | Ph:715.841.8757 | www.airolite.com.
 - 4. Air Performance Louvers LLC. | 159 Genco Drive, Hartford, AL 36344 | Ph: 334.588.0191 or 588.0070 | www.airperformancelc.com.
 - 5. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect not less than Ten (10) days prior to scheduled bid opening.

2.2 STATIONARY BLADE LOUVER

- A. Model 4375Z125 as manufactured by Reliable Louver Company
- B. Fabrication:
 - 1. Design: Stationary non- drainable louver with drain gutters in head frame with downspouts in the jambs and mullions with all welded construction. Hidden vertical supports to allow unlimited continuous line appearance. Steeply angled integral sill.
 - 2. Frame:
 - a. Frame Depth: 4 inches (102 mm).
 - b. Wall Thickness: .081 inch (2.1 mm) nominal.
 - c. Material: Extruded aluminum, Alloy 6063-T6.
 - 3. Blades:

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- Style: Non- Drainable: 37.5 degrees at 5-3/32 inches (129 mm)
 - a. Wall Thickness: 0.081 inch (2.1 mm), nominal.
 - b. Material: Extruded aluminum, Alloy 6063 T6.
- 4. Minimum Assembly Size: 12 inches wide by 12 inches high (305 mm x 305 mm).
- 5. Maximum Factory Assembly Size: Single sections shall not exceed 120 inches wide by 90 inches high (3048 mm x 2286 mm) or 90 inches wide by 120 inches high (2286 mm x 3048). Louvers larger than the maximum single size shall be require field assembly of smaller sections.
- 6. Recycled Content: 18% post-consumer. 55% pre-consumer, post-industrial, total 73% by weight.
- C. Performance Data:
 - 1. Based on testing 48 inch x 48 inch (1,219 mm x 1,219 mm) size unit in accordance with AMCA 500.
 - 2. Free Area: 54 percent, nominal.
 - 3. Free Area Size: 8.58 square feet (0.79 m²).
 - 4. Maximum Recommended Air Flow through Free Area: 803 feet per minute (4.08 m/s).
 - 5. Air Flow: 6890 cubic feet per minute (3.25 m³/s).
 - 6. Maximum Pressure Drop (Intake): 0.15 inches w.g. (0.035 kPa).
 - 7. Water Penetration: Maximum of 0.01 ounces per square foot (3.1 g/m²) of free area at an air flow of 803 feet per minute (4.08 m/s) free area velocity when tested for 15 minutes.
- D. Design Windload: Per Code.
- E. Louvers shall be factory engineered to withstand the specified seismic loads.
 - 1. Minimum design loads shall be calculated to comply with ASCE – 7, or local requirements of Authority Having Jurisdiction (AHJ).

2.3 STATIONARY BLADE LOUVER- SPECIALTY SHAPES

- A. Model RCS (Shape and size as indicated on drawings) as manufactured by Reliable Louver Company
- B. Fabrication:
 - 1. Design: Stationary non- drainable louver with drain gutters in head frame with downspouts in the jambs and mullions with all welded construction. Hidden vertical supports to allow unlimited continuous line appearance. Steeply angled integral sill.
 - 2. Frame:
 - a. Frame Depth: 4 inches (102 mm).
 - b. Wall Thickness: .081 inch (2.1 mm) nominal.
 - c. Material: Extruded aluminum, Alloy 6063-T5.
 - 3. Blades: 4375Z Blade Styles
 - Style: Non- Drainable: 37.5 degrees at 5-3/32 inches (129 mm)
 - c. Wall Thickness: 0.081 inch (2.1 mm), nominal.
 - d. Material: Extruded aluminum, Alloy 6063 T6.
- C. Performance Data:
 - 1. Free Area: 54 percent, nominal.
 - 2. Free Area Size: 8.58 square feet (0.79 m²).
 - 3. Maximum Recommended Air Flow through Free Area: 803 feet per minute (4.08 m/s).
 - 4. Air Flow: 6890 cubic feet per minute (3.25 m³/s).
 - 5. Maximum Pressure Drop (Intake): 0.15 inches w.g. (0.035 kPa).
 - 6. Water Penetration: Maximum of 0.01 ounces per square foot (3.1 g/m²) of free area at an air flow of 803 feet per minute (4.08 m/s) free area velocity when tested for 15 minutes.
- D. Design Windload: Per Code.
- E. Louvers shall be factory engineered to withstand the specified seismic loads.
 - 1. Minimum design loads shall be calculated to comply with ASCE – 7, or local requirements of Authority Having Jurisdiction (AHJ).

2.4 ACCESSORIES

- A. Bird Screen: Install insect screens on intake louvers and bird screens on exhaust louvers. Do not install insect screens on HVAC intake louvers.

2. Aluminum: Aluminum, 5/8 inches by 0.040 inch (16 mm by 1 mm), expanded and flattened.
 3. Frame: Removable. Re-wireable.
- B. Insect Screens: Install insect screens on intake louvers and bird screens on exhaust louvers. Do not install insect screens on HVAC intake louvers.
1. Aluminum: 18-16 mesh, mill finish, .011 inch (0.3 mm) wire.
 2. Frame: Aluminum.
- ii. Extended Sills:
1. Extruded aluminum, Alloy 6063-T6. Minimum nominal thickness 0.060 inch (1.5 mm).
 2. Formed aluminum, Alloy 3003. Minimum nominal thickness 0.081 inch (2.1 mm).
- iii. Visible Mullions: Manufacturer's standard horizontal or vertical visible mullions for architectural accent as indicated on drawings.

2.5 FINISHES

- A. Finish: 70 percent PVDF: Finish shall be applied at 1.2 mil total dry film thickness.
1. Coating shall conform to AAMA 2605. Apply coating following cleaning and pretreatment.
Cleaning: AA-C12C42R1X.
 - a. Standard 2-coat.
 2. 20-year finish warranty.
- B. Color: Color to be selected by Architect.

2.6 MATERIALS, GENERAL:

- A. Fastenings: Use same material as items fastened, unless otherwise indicated. Fasteners for exterior applications may be hot-dip galvanized, stainless steel or aluminum. Provide types, gages and lengths to suit unit installation conditions. Use Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.
- B. Anchors and Inserts: Use metal anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required.
- C. Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).

2.7 FABRICATION, GENERAL:

- A. Provide louvers and accessories of design, materials, sizes, depth, arrangement, and metal thicknesses indicated, or if not indicated, as required for optimum performance with respect to airflow; water penetration; air leakage where applicable (for adjustable units, if any); strength; durability; and uniform appearance.
- B. Fabricate frames including integral sills to suit adjacent construction with tolerances for installation, including application of sealants in joints between louvers and adjoining work.
- C. Include supports, anchorages, and accessories required for complete assembly.
- D. Provide sill extensions and loose sills made of same material as louvers, where indicated, or required for drainage to exterior and to prevent water penetrating to interior.
- E. Maintain equal blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

PART 3 – EXECUTION

EXAMINATION AND PREPARATION

- A. Prepare substrates and openings using methods recommended by manufacturer for achieving best result for substrates under project conditions.
- B. Do not proceed with installation until substrates and nailers have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

INSTALLATION

- A. Install in accordance with manufacturer's instructions.
 - 1. Locate and place units level, plumb, and at indicated alignment with adjacent work.
 - 2. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
 - 3. Form closely fitted joints with exposed connections accurately located and secured.
 - 4. Provide perimeter reveals and openings of uniform width for sealants and joint fillers as indicated on Drawings.
 - 5. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
 - 6. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
- B. Install concealed gaskets, flashings, joint fillers, and insulation, as installation progresses, where weathertight joints are required. Comply with Division 7 Section "Joint Sealants" for sealants applied during installation.

ADJUSTING, CLEANING AND PROTECTION

- A. Test operation of adjustable louvers and adjust as needed to produce fully functioning units that comply with requirements.
- B. Protect products from damage until completion of project. Use temporary protective coverings where needed and approved by manufacturer. Remove protective covering at the time of Substantial Completion.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 10410 - IDENTIFYING DEVICES

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. Types of identifying devices specified in this section include the following:
 - 1. Room Signs (See Door Schedule)
- B. Note to the Contractor: If the Contract Sum (as awarded) is \$100,000.00 or more, the Contractor shall furnish and erect a project sign and interior plaques as shown in "Detail of Project Sign" (DCM Form C-15) and "Plaque Detail" bound in the Project Manual at the end of "General Conditions". 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.
- C. Extent of signs and plaque is indicated on the drawings.

1.3 QUALITY ASSURANCE

- A. Drawings and Specifications are based on one manufacturer's standard products. Another standard system of a similar and equivalent nature may be acceptable when the differences do not materially detract from the design concept or intended performance as judged solely by the Architect.
- B. **General Contractor is responsible for verifying signage requirements and correct wording, names etc. with Owner and Architect before ordering.**

1.4 SUBMITTALS

- A. Shop Drawings: Submit shop drawings for each type of device. Include large scale sections of typical members and other components. Provide dimensioned elevations. Show anchorages, grounds and reinforcement and indicate finishes.

PART 2 - PRODUCTS

2.1 ROOM SIGNS

- A. MANUFACTURER:
 - 1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
 - a. ASI Sign Systems, Inc., 8181 Jetstar Drive, Suite 100, Irving, TX 75063;
www.asisignage.com; 1-800-274-7732
 - b. Best Sign Systems, www.bestsigns.com; 1202 N. Park Avenue, Montrose, CO 81401-3171, Phone (970) 249-2378 or 1-800-235-2378; Fax (970) 249-0223
 - c. Leeds Architectural Letters of Alabama Inc, www.leedsletters.com; P.O. Box 40, Leeds, AL 35094; Phone (205) 699-5271; Fax (205) 699-3342
 - d. Bayuk Graphic Systems, Inc., www.bayukgraphics.com; 5005 Old Lincoln Highway Parkesburg, PA 19365; Phone: (717)-442-0274; Fax: (717)-442-1289
 - e. Mohawk Sign Systems; www.mohawksign.com; 5 Dandreaano Dr, Amsterdam, NY 12010; Ph. 518.842.5303.
 - 2. Substitutions: Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

B. MATERIALS:

1. Provide 6" x 8" high laminated plastic with raised lettering complying with the Americans with Disabilities Act (ADA).
2. All Signs MUST include 1" Slide In Window Slot.
3. Color to be selected by the Architect after bid date from manufacturer standards.
4. Use International Symbols of accessibility for identifying facilities as accessible.
5. Letters and numerals shall be raised 1/32 in (0.8 mm) minimum, upper case, sans serif or simple serif type and shall be accompanied with Grade 2 Braille.
6. Raised characters shall be at least 5/8 in (16 mm) high, but no higher than 2 in (50 mm).
7. Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. The border dimension of the pictogram shall be 6 in (152 mm) minimum in height.
8. **See Door Schedule. If not shown provide 20 letter characters per room sign.**
9. **The Supplier will be required to meet with the Owner for exact wording for all room signs before preparation of the shop drawing submittal to the Architect for approval.)**
10. Tactile characters on signs shall be located 48 inches (1220 mm) minimum above the finish floor or ground surface, measured from the baseline of the lowest tactile character and 60 inches (1525 mm) maximum above the finish floor or ground surface, measured from the baseline of the highest tactile character.
 - a. Where a tactile sign is provided at a door, the sign shall be located alongside the door at the latch side.
 - b. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf.
 - c. Where a tactile sign is provided at double doors with two active leafs, the sign shall be located to the right of the right hand door.
 - d. Where there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located on the nearest adjacent wall.
 - e. Signs containing tactile characters shall be located so that a clear floor space of 18 inches (455 mm) minimum by 18 inches (455 mm) minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position. Mounting devices shall be concealed.

2.2 METAL LETTERS

A. MANUFACTURER:

1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
 - a. Impact Architectural Signs, www.impactsigns.com; 26 E. Burlington Avenue, LaGrange, IL 60525; (708) 469-7178; impact@impactsigns.com
 - b. Leeds Architectural Letters of Alabama Inc, www.leedsletters.com; P.O. Box 40, Leeds, AL 35094; Phone (205) 699-5271; Fax (205) 699-3342
 - c. Matthews Architectural Products, www.matthewsid.com; 2 North Shore Pittsburgh, PA 15212; (412) 571-5500; (800) 950-1317
 - d. A.R.K. Ramos Architectural Signage, www.arkramos.com; 1321 S. Walker Ave., Oklahoma City, OK; Ph. 800.725.7266
2. Substitutions: Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

B. MATERIALS

1. Provide standard cast aluminum letters for exterior architectural signage shown on drawings and as follows:
2. Building Signage: Provide full size sample prior to manufacture of all letters.
 - a. Mounting shall be projected mount without collars set in adhesive.
 - b. Color shall be anodized aluminum.
 - c. Style of letter shall be as follows:
 - I. Height: 15" High - Upper Case.
 - II. Depth: 1 ¼" Deep – Upper Case.
 - III. Font: Arial Bold
 - IV. Letters to read as indicated on drawings.

2.3 PLAQUE

A. MANUFACTURER:

1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
 - a. Impact Architectural Signs, www.impactsigns.com; 26 E. Burlington Avenue, LaGrange, IL 60525; (708) 469-7178; impact@impactsigns.com
 - b. Leeds Architectural Letters of Alabama Inc, www.leedsletters.com; P.O. Box 40, Leeds, AL 35094; Phone (205) 699-5271; Fax (205) 699- 3342
 - c. Matthews Architectural Products, www.matthewsid.com; 2 North Shore Pittsburgh, PA 15212; (412) 571-5500; (800) 950-1317
 - d. A.R.K. Ramos Architectural Signage, www.arkramos.com; 1321 S. Walker Ave., Oklahoma City, OK; Ph. 800.725.7266
2. Substitutions: Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

B. MATERIALS

1. Refer to *Detail Of Plaque (ABC Form C-16, August 2001)* at the front end of the project manual.
2. Size: 24" high x 30" wide.
3. Cast aluminum with bronze finish of standard alloy, hand tooled and chased.
4. Raised letters and border.
5. Satin finish.
6. Background pebbled finish and oxidized to a darker finish.
7. Casting to be free of pits and holes, square and true with no warping.
8. Border style to be single line.
9. Letters to be flat face classic design.
10. Furnish Rubbing to Architect for approval.

C. Wording on the plaque shall read as follows.

(NAME OF PROJECT) (CITY NAME), ALABAMA
ERECTED (Year)
STATE OF ALABAMA
THE (NAME) COUNTY BOARD OF EDUCATION
MR. (NAME), PRESIDENT
MRS. (NAME), VICE PRESIDENT
MR. (NAME), BOARD MEMBER
MR. (NAME), BOARD MEMBER
MR. (NAME), BOARD MEMBER
MRS. (NAME), BOARD MEMBER
MRS. (NAME), BOARD MEMBER
DR. (NAME), SUPERINTENDENT
SUPERVISED BY
Alabama Real Property Management, Division of Construction Management
McKEE AND ASSOCIATES ARCHITECTS, INC
(COMPANY NAME), CONTRACTOR

2.4 PROJECT SIGN

A. MATERIALS

1. Refer to *Detail of Project Sign (DCM Form C-15, August 2021)* at the front end of the project manual.

B. Wording on the project sign shall read as follow.

STATE OF ALABAMA THE (NAME) COUNTY BOARD OF EDUCATION MR. (NAME), PRESIDENT MRS. (NAME), VICE PRESIDENT MR. (NAME), BOARD MEMBER MR. (NAME), BOARD MEMBER MR. (NAME), BOARD MEMBER MRS. (NAME), BOARD MEMBER MRS. (NAME), BOARD MEMBER DR. (NAME), SUPERINTENDENT KAY IVEY, GOVENOR <i>"Investing in Alabama's Future"</i> (NAME OF PROJECT) (CITY NAME), ALABAMA Alabama Real Property Management, Division of Construction Management McKEE AND ASSOCIATES ARCHITECTS, INC (COMPANY NAME), CONTRACTOR

2.5 FABRICATION

- A. General: Fabricate signs to comply with requirements indicated including, dimensions, design details, quality, thickness and finish of materials. Use materials and shapes of sufficient thickness, with reinforcing, if needed, to produce sufficient flatness, free of "oil canning", and to impart sufficient strength for size, design and application indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install units plumb and level, in locations and with mounting shown. Securely attach to the supporting structure with concealed fasteners, in accordance with the manufacturer's installation instructions.

3.2 CLEANING AND PROTECTION

- A. At completion of the installation, clean surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

END OF SECTION

SECTION 10440 - FIRE EXTINGUISHERS AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire Extinguishers.
 - 2. Extinguisher cabinets.
 - 3. Accessories.
- B. Related Requirements:
 - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 REFERENCES

- A. Reference Standards:
 - 1. ASTM International (ASTM):
 - a. ASTM E814-11a, Standard Test Method for Fire Tests of Penetration Firestop Systems.
 - 2. International Code Council (ICC):
 - a. International Building Code (IBC) - Current Edition.
 - 3. Intertek Testing Services/Warnock-Hersey International (ITS/WHI)
 - 4. National Fire Protection Association (NFPA):
 - a. NFPA 10-2010, Standard for Portable Fire Extinguishers: For criteria covering installations for Class A, B, C, D, and K hazards as well as the selection, inspection, maintenance, recharging, and testing of portable fire extinguishing equipment.
 - b. NFPA 70-2011, National Electrical Code.
 - 5. Underwriters Laboratories, Inc. (UL)
 - 6. United States Code (USC):
 - a. Americans with Disabilities Act of 1990, as amended by the ADA Amendments Act of 2008: For restrictions relating to cabinet projections in corridors.

1.3 ACTION SUBMITTALS

- A. Submit in accordance with Section 01600:
 - 1. Product Data:
 - a. Cabinets: Materials description for fire extinguisher cabinets include roughing-in dimensions, details showing mounting methods, relationships to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, door style and materials.
 - b. Extinguishers: Materials description for fire extinguishers; include ratings and classifications.
 - c. Installation instructions for each product specified.
 - 2. Shop Drawings:
 - a. Small-scale plans showing locations of fire extinguisher cabinets and individual fire extinguishers.
 - b. Schedules showing each type of cabinet and extinguisher to ensure proper fit and function.
 - c. Indicate installation procedures and accessories required for a complete installation.

3. Samples:

- a. Extinguisher Cabinet Door and Trim Finishes: For each type of exposed finish required, prepared on samples of size indicated below:
 - i. Size: 6 inches (150 mm) square.

1.4 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

- A. Comply with standards referenced in Article 1.02 - REFERENCES.
- B. Provide fire extinguishers, cabinets and accessories produced by a single manufacturer.
- C. Provide fire extinguishers of type approved by UL, State Fire Marshal's Office, and local regulatory agencies, if any.
- D. Fire-Rated, Fire Protection Cabinets: Listed and labeled to comply with requirements in ASTM E814 for fire-resistance rating of walls where they are installed.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle fire protection specialties and related materials using means and methods that will prevent damage, deterioration, or loss.
 - 1. Deliver components in manufacturer's original packaging, properly labeled for identification.

1.7 WARRANTY

- A. All Fire Protection Products (except fire extinguishers) carry a one year warranty after date of shipment against defects in materials or workmanship. Fire extinguishers carry a longer warranty. We will replace or repair any product found defective within this period. No other warranty expressed or implied is valid. Manufacturer's warranty, terms and conditions apply in all cases. Please see complete warranty on our website for more details.

PART 2 - PRODUCTS

2.1 FIRE PROTECTION SPECIALTIES MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. J. L. Industries, Inc., a division of Activar Construction Products Group; 9702 Newton Av S Bloomington, MN 55431; (800) 554-6077, (952) 835-6850, (952) 835-2218 (FAX); SALES@ACTIVARCPG.COM; www.activarcpg.com
 - 2. Larsen's Manufacturing Company
 - 3. Modern Metal Products
- B. Substitutions: Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 FIRE EXTINGUISHERS

- A. Multi-Purpose Chemical Type: Extinguisher unit containing a fluidized and siliconized mono ammonium phosphate powder; nonconductive and nontoxic.
 - 1. Construction: Heavy duty steel cylinder with metal valve and siphon tube, O-ring seal, replaceable valve stem seal, visual pressure gage, pull pin and upright squeeze grip.
 - 2. Finish: Factory powder-coated; Red.
 - 3. Effectiveness (Rating): Class A, B, and C fires.
 - 4. Model Identification and UL Rating: Cosmic **10E; 4A-80BC**.
 - 5. "Start Up Tags" for each fire extinguisher must be provided and approved by Local Fire

Department before Final Inspection.

- B. Class K Wet Chemical Type: Extinguisher unit containing a low "pH" potassium acetate solution.
 - 1. Construction: Stainless steel cylinder with protective nozzle tip orifice seal and nonmetallic nozzle tip finger guard, O-ring seal, replaceable valve stem seal, visual pressure gage, pull pin, and upright squeeze grip.
 - 2. Effectiveness (Rating): Class K fires.
 - 3. Model Identification and and UL Rating: **25; Class K.** Capacity: 2.5 gal.

2.3 EXTINGUISHER CABINETS

- A. Cabinet with Steel Trim and Door:
 - 1. **Ambassador Series, Model 1017F10** at Non-Fire Rated Walls.
 - 2. **Ambassador Series, Model 1017F10FX2** at Fire Rated Walls.
- B. Cabinet Style: **Semi-recessed**.
 - 1. Tub: Cold-rolled steel.
 - a. Finish: Factory-applied powder coat paint finish.
 - i. To be selected by Architect after bid date from manufacturer Standard Colors.
 - 2. Door and Trim Construction: Cold-rolled steel; flush doors with 5/8 inch (15.88 mm) door stop attached by continuous hinge and equipped with zinc-plated handle with roller catch.
 - a. Finish: Factory-applied powder coat paint finish.
 - i. To be selected by Architect after bid date from manufacturer Standard Colors.
 - 3. Trim Style and Depth: Cabinets located in corridors shall not protrude into the hall way more than 2 1/2".
 - a. Semi-Recessed Cabinet:
 - i. Rolled Edge: 2-1/2 inch (63.50 mm).
 - b. Trim Dimensions: 1-3/4 inch (44.45 mm) face trim on frame and 1-1/4 inch (31.75 mm) face trim on door.
- C. Fire-Rating: Provide Fire-Rated cabinets for 1-hour and 2-hour combustible and noncombustible wall systems as required.

2.4 CABINET DOOR STYLES, GLAZING TYPES, AND ADDITIONAL OPTIONS

- A. Door Style:
 - 1. Style F: Full glazing; with pull handle.
- B. Door Glazing:
 - 1. Type 10: Clear acrylic.
- C. Additional Options:
 - 1. Cabinet Lettering:
 - a. Text: FIRE EXTINGUISHER.
 - b. Color(s): [Red] [Black] [White]. To be selected by Architect after bid date.

2.5 SOURCE QUALITY CONTROL

- A. Ship extinguishers to the Project site fully charged, EXCEPT those which contain water as an extinguishing agent, if any.
- B. Obtain Fire Extinguishers and Fire Extinguisher Brackets from same manufacturer to ensure compatibility.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where recessed and semi-recessed cabinets will be installed and blocking where surface mounted cabinets will be installed.
 - 1. Notify the Contractor in writing of conditions detrimental to proper and timely completion of the installation.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install cabinets in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.
 - 1. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
 - 2. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.
 - 3. Maintain fire ratings where cabinets are recessed into fire-rated wall systems.
- B. Cabinet Lettering:
 - 1. Identify fire extinguisher in cabinet with lettering spelling "FIRE EXTINGUISHER" painted on door by silk screen process. Provide lettering on door as indicated, or if not indicated, as selected by Architect from manufacturer's standard letter sizes, styles, colors and layouts.

3.3 FIELD QUALITY CONTROL

- A. Ensure that each extinguisher is fully charged, and that inspection of each extinguisher has been performed, as evidenced by the National Association of Fire Equipment Distributors certification tag, just prior to turnover.

3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet and mounting bracket manufacturers.
- E. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 10500 - LOCKERS

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. Products in this section include the following:
 - 1. KD Metal Lockers - Staff Wardrobe

1.3 QUALITY ASSURANCE

- A. Uniformity: Provide each type of metal locker as produced by a single manufacturer, including necessary mounting accessories, fittings and fastenings.
- B. **Imported Manufactured/Fabricated Lockers will not be accepted.**

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for metal locker units.
- B. Samples: Submit color samples on squares of same metal to be used for fabrication of lockers.
- C. Shop Drawings: Submit shop drawings for metal lockers, verifying dimensions affecting locker installations. Show lockers in detail, method of installation, fillers, trim, base, and accessories. Include locker numbering sequence information.

1.5 JOB CONDITIONS

- A. Do not deliver metal lockers until building is ready for locker installation. Protect from damage during delivery, handling, storage and installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
 - 1. List Industries Inc., Superior (Basis of Design); 401 Jim Moran Blvd., Deerfield Beach, Florida 33442; www.listindustries.com; PH: 1.800.776.1342.
 - 2. Penco; 1820 Stonhenge Drive, Greenville, NC 27858; www.pencoproducts.com; PH: 800.562.1000.
 - 3. De Bourgh Manufacturing Co. | 27505 Otero Ave. La Junta, CO 81050 | Ph: 800.328.8829 | www.debourgh.com.
 - 4. Tennsco Corp. | 201 Tennsco Drive, Dickson, TN 37055 | PH: 866.446.8686 | www.tennsco.com.
 - 5. Lyon; 420 N. Main Street, Montgomery, IL 60538; www.lyonworkspace.com; PH: 800.433.8488.

2.2 MATERIALS

A. **Superior Classic KD Lockers (Standard Knock-Down Construction)**

- 1. **Construction:** Fabricate lockers square, rigid and without warp, with metal faces flat and free from dents or distortion. Make all exposed metal edges safe to touch. Weld frame members together to form rigid, one-piece structure. Weld, bolt, or rivet other joints and connections as

standard with manufacturer. Grind exposed welds flush. Do not expose bolts or rivet heads on fronts of locker doors or frames except for fastening of number plates and recessed handle.

2. **Frames:** Fabricate of 16 gauge (minimum) channels, with integral continuous door stop/strike formed on both latch and hinge side vertical members. Cross frame members of 16 gauge channel shapes, including intermediate cross frame members on double and triple tier (frames with doors over 18" high) lockers shall be securely welded to the vertical framing members to ensure rigidity. Rubber bumpers shall be provided to cushion door closing.
3. **Finishing:** All locker parts to be cleaned and coated after fabrication with a seven stage zinc/iron phosphate solution to inhibit corrosion, followed by a coat of high grade custom blend powder electrostatically sprayed and baked at 350 degrees Fahrenheit for a minimum of 20 minutes to provide a tough durable finish. Color to be selected from manufacturer's standard list of colors. Interior components to be painted #729 Parchment. Two-Tone Color Combination: Shall be at no additional cost with the locker frame and trim chosen from one color and the doors may be one of any other color chosen from manufacturers standard selection.
4. **Wardrobe Doors:** Doors 20" high and over to be fabricated from single sheet prime 16 gauge (18 gauge for doors 9" wide as well as Two-Person and Duplex doors) with single bends at top and bottom and double bends at the sides. The channel formed by the double bend at the latch side is designed to fully conceal the lock bar. Doors shall be louvered.
5. **Box Doors:** Doors 18" high and under to be fabricated from single sheet prime 18 gauge with single bends at top, bottom and sides. Doors shall include a combination friction catch door pull. Padlock Strike Plates are optional. Doors shall be fabricated to accept a built-in combination lock or padlock. Doors with projecting spring latches shall not be acceptable. Doors shall be louvered.
6. **Ventilation:** Provide stamped, louvered vents in door face not less than 6 louver openings top and bottom.
7. **Door Hinges:** All doors shall include a 16 gauge continuous piano hinge welded to the door and riveted to the frame. All doors to be right hand, side hinged.
8. **Stainless Steel Recessed Locker Handle:** All wardrobe doors shall have recessed, not less than 304 stainless steel, deep drawn handle shaped to receive a padlock or built-in combination lock. The recess pan shall be deep enough to have the lock be flush with the outer door face. Box doors shall be equipped with a combination friction catch door pull as stated above.
9. **Latch Assembly:** The latching mechanism for wardrobe doors shall be finger lift control type constructed of 14 gauge (minimum) steel with a nylon cover that has a generous finger pull. Spring activated nylon slide latches shall be completely enclosed in the lock channel allowing doors to close with the lock in the locked position. Locking devise shall be designed for use with either built-in combination locks or padlocks. Latch hooks shall be securely welded to the vertical frame channel on the strike side to engage the nylon slide latches. Three latch hooks for doors 48" and higher, two latch hooks for doors under 48" high.
10. **Body:** Fabricate back and sides of 24 gauge (minimum) sheet steel, with double flanged connections extending full height. Form top, bottom and intermediate tier dividers of 24 gauge (minimum) sheet steel with single return bends at all sides. Bolt top and bottom as well as horizontal tier dividers of wardrobe openings to front horizontal frame members at not less than one place in addition to side panels. Form hat shelves at 60" and 72" high single tier lockers of 24 gauge (minimum) sheet-steel with single bends at sides and back and a double bend at front.
11. **Locks (If required):** Shall be master-keyed to one system for the entire project. (See lock use chart for suggested lock application)
12. **Equipment:** Furnish each locker with the following items, unless otherwise shown:

- a. **Single tier lockers:** Openings 60" and 72" shall include one hat shelf, one double prong ceiling hook and a minimum of two single prong hooks.
 - b. **Double tier lockers:** Openings 30" and 36" high shall include one double prong ceiling hook and a minimum of two single prong hooks.
 - c. **Triple tier lockers:** Openings 20" and 24" high shall include one double prong ceiling hook only.
 - d. **Box lockers:** No hooks
13. **Number Plates:** Manufacturer's standard etched, embossed, or stamped, non-ferrous metal number plates with numerals not less than 3/8" high. Number lockers in sequence as directed by Architect. Attach plates to each locker door, near top, centered, with at least 2 fasteners of same finish as number plate.
14. **Continuous Sloping Tops:** Not less than 20-gage sheet steel, approximately 25 degree pitch, in lengths as long as practicable but not less than 4 lockers. Provide closures at ends. Finish to match lockers. Provide tops only at staff lockers located in kitchen.
15. **Separators:** Provide horizontal dividers of not less than 16-gage sheet steel between doors of multiple-tier lockers, to ensure rigidity.
16. **Filler Panels:** Provide filler panels where indicated, of not less than 18-gage steel sheet, factory-fabricated and finished to match locker units.
17. **Warranty:** Superior KD lockers are covered against all defects in materials and workmanship excluding finish, damage resulting from deliberate destruction and vandalism under this section for a period of Two years.

2.3 LOCKER SCHEDULE

- A. **Location:** All locker locations as indicated on drawings.
- B. **Size:** 12" wide x 12" depth x 72" height, "2 Tier"

PART 3 - EXECUTION

3.1 PREPARATION

- A. **Field Measurements:** Take field measurements prior to preparation of shop drawings and fabrication of special components, when possible, to ensure proper fitting of work. However, allow for adjustment and fitting of trim and filler panels wherever taking of field measurements before fabrication might delay work.

3.2 INSTALLATION

- A. Install metal lockers at locations shown in accordance with manufacturer's instructions for plumb, level, rigid, and flush installation.
- B. Space fastenings about 48" o.c., unless otherwise recommended by manufacturer, and apply
- C. through back-up reinforcing plates where necessary to avoid metal distortion; conceal fasteners insofar as possible.
- D. Install trim, concrete base, sloping top units, and metal filler panels where indicated, using concealed fasteners to provide flush, hairline joints against adjacent surfaces.
- E. Provide concrete base for all interior lockers.

3.3 ADJUST AND CLEAN

- A. Adjust doors and latches to operate easily without binding. Verify that integral locking devices are operating properly.
- B. Touch up marred finishes but replace units which cannot be restored to factory-finished appearance. Use only materials and procedures recommended of furnished by locker manufacturer.

END OF SECTION

SECTION 10800 - TOILET ACCESSORIES

PART 1 - GENERAL

1.1 GENERAL

- 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 RELATED DOCUMENTS

- A. Section 06100, Rough Framing for Blocking

1.3 DESCRIPTION OF WORK

- B. Extent of each type of toilet accessory is indicated on drawings and schedules.
- C. **NOTE: Prior to placing any orders for items within this section, the General Contractor is responsible for verifying all toilet accessories with the Owner. Should the owner choose to provide/supply any of these toilet accessories, the General Contractor shall issue a deductive Change Order for material only. The General Contractor will maintain responsibility for installation.**
- D. Toilet Accessories **Furnished and Installed by the Contractor** as follows:
 - 1. Soap Dispensers
 - 2. Toilet Tissue Dispensers
 - 3. Paper Towel Dispensers
 - 4. Grab Bars
 - 5. Mirror Units
 - 6. Utility Shelf/Mop Rack

1.4 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.
- B. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.
- C. Products: Provide products of same manufacturer for each type of accessory unit and for units exposed in same areas, unless other- wise acceptable to Architect.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each toilet accessory.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturer's products have been used to establish minimum standards for materials, workmanship and function.

- 1. Soap Dispensers:

Wall Mounted over each sink

- a. Approved Products:

- i. Bobrick #B-2112

- ii. ASI #0345

- iii. Bradley #6562

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2. Toilet Tissue Dispensers:
 - a. Roll Type: (One each water closet)
 - b. Approved Products:
 - i. Bradley #5425
 - ii. ASI #0040
 3. Paper Towel Dispensers:
 - a. Roll Type
 - b. Surface Mounted
 - c. Approved Products:
 - i. Bobrick #B52860
 4. Grab Bars:
 - a. Where shown on Plans with Safety-Grip Finish.
 - b. Approved Products:
 - i. Bradley Corporation #8122
 - ii. Series ASI #3200P
 - iii. Bobrick #B6806.99
 5. Mirror Units:
 - a. 18" x 36" One over each lavatory
 - b. 24" x 48" One at each Gang Toilet (if applicable)
 - c. Approved Products:
 - i. Bradley #780
 - ii. Bobrick #B290
 - iii. ASI #0600
 6. Utility Shelf/Mop Rack:
 - a. Provide at all locations indicated on drawings.
 - b. Provide minimum of One (1) at each Janitor Closet if none are indicated on drawings.
 - c. Prior to installation of items within this section, the General Contractor is responsible for verifying actual installation locations with the Architect, regardless of locations indicated on drawings.
 - d. Approved Products:
 - i. ASI #1308-4 (44")
 - ii. Bradley #9934 (44')
 - iii. Bobrick #B239 x 44
- B. Equal products of other manufacturers may be used in the work provided such products have been approved by the Architect not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS, GENERAL

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gage minimum, unless otherwise indicated.
- B. Mirror Units: Mirror glass shall be FS DD-G-451, Type I, Class I, Quality q2, 1/4" thick, with silver coating, copper protective coating, and non-metallic paint coating complying with FS DD-M-411. Mirror shall be provided in stainless steel frames.

- C. Fasteners: Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

2.3 FABRICATION

- A. General: Stamped names or labels on exposed faces of toilet accessory units are not permitted, except where otherwise indicated; in obtrusive labels on surfaces not exposed to view are acceptable. Where locks are required for a particular type of toilet accessory, provide same keying throughout project.
- B. Furnish two keys for each lock.
- C. Surface Mounted Toilet Accessories General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.
- D. Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all welded construction, without mitered corners. Hang doors or access panels with full-length stainless steel piano hinge. Provide anchorage which is fully concealed when unit is closed.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install toilet accessory units in accordance with manufacturer's instructions, using fasteners which are appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations and at heights indicated.

3.2 ADJUSTING AND CLEANING

- A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
- B. Clean and polish all exposed surfaces after removing labels and protective coatings.

END OF SECTION

SECTION 11 40 00 – FOOD SERVICE EQUIPMENT

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 DESCRIPTION

- A. All General Provisions and Sections of the Project Manual, including the AIA General Conditions and Supplementary Conditions & General Requirements; all bidding documents including the Architectural Specifications, Itemized Specifications, Bidding Requirements, Conditions of the Contract, the Contract Documents, all drawings, all Addenda issued and all applicable Divisions of the Architect's Project Manual apply to all the work specified under this Section. Bidder shall examine all other sections and all other drawings including mechanical and electrical drawings for discrepancies and/or conflicts. It is the responsibility of Food Service Equipment Bidder to obtain access to these Project Manuals and drawings.
- B. Each Bidder shall examine the bidding documents carefully and, not later than five (5) days prior to the date for receipt of bids, shall make written request to the Architect for the intent or true meaning of any part of the Contract Documents, or for interpretation or correction of any ambiguity, inconsistency, conflict, discrepancy, omission and/or error that he may discover. Any interpretation, clarification, information, amendment and/or correction is issued as a written Addendum by the Architect. Only a written interpretation or correction by Addendum is binding. No bidder shall rely upon any interpretation or correction given by any other method. Architect will not be responsible for oral interpretations or instructions. Addenda are incorporated, by reference, into the contract. Failure by any bidder to receive any addendum shall not relieve the bidder of any obligation and it is the sole responsibility of each bidder to insure that he has received all addenda. Bidder shall familiarize himself with the site, a complete set of Drawings and Specifications and planned conditions and service connections; his failure to do so shall in no way relieve him of responsibility and no claims for extras shall be allowed in his behalf for failure to do so. Each bidder by submitting his Proposal represents that he has read and understands all the provisions of the Project Manual. Should discrepancies and/or conflicts be discovered after the work has started, the Contractor shall report them to the Architect immediately, and no work connected with the discrepancies and/or conflicts shall be undertaken; or if underway, such work shall be stopped immediately until the Contractor and the Architect agree on the clarification thereof.
- C. If there is any conflict within or between any of the Bidding Documents involving the quality or quantity of work required, it is the intention of the Contract that the work of highest quality, greatest quantity, and greatest expense shown or specified shall be furnished. Whether or not the word "all" is used in the specification, coverage is intended to be complete, except where partial coverage is specifically and expressly noted. In all cases where an item is referred to in the singular number, it is intended that the reference shall apply to as many such items as are required to complete the work.
- D. Each bidder shall visit the site of the Work and/or review all applicable project drawings. Each bidder shall fully inform himself prior to bidding of the conditions and limitations under which the Work is to be performed. He shall include in his bid a sum to cover all costs in order to perform the Work as related to the conditions and limitations. No allowance will be made to any bidder because of lack of such examining knowledge. The submission of a bid will be construed as conclusive evidence that the bidder has made such examination.

1.3 PROJECT FORMS

- A. Forms used on this Project (not inclusive) are AIA documents outlined in the Architectural specifications.
- B. Within forty-eight (48) hours after written or verbal notification from the Architect or his authorized representative has been received by the General Contractor/Food Service Equipment Contractor, an itemized cost for the food service equipment shall be submitted to the Architect and his Food Service Consultant. With the itemized cost, the Food Service Equipment Contractor is required to identify each items manufacturer and model number as based on the itemized equipment specifications and all addenda. Any applicable bond amounts are entered separately.

1.4 BIDDER RESPONSIBILITY

- A. Bidders shall carefully examine the contract and conditions therein affecting work and procedure prior to submitting bids for which contract will be binding.
- B. Bonding and Insurance requirements are given in another section of the Project Manual.
- C. Instructions for completion of Schedule of Value, Payment Request, etc., are found in a preceding section and are the standard AIA procedure as modified by the Architect.
- D. In addition to the progress schedule required by the AIA General Conditions, the Food Service Equipment Contractor also submits his proposed scheme of work for approval, describing proposed sequences of work from beginning to completion of the Work and their correlation with the Owner's specific requirements. Equipment is not delivered, removed from the crates, set-in-place until as a minimum all painting has been completed; ceilings, hood and ventilation duct work are in place; floor is acid cleaned (IF APPROPRIATE); all rough-in connections are in place. Site must be ready for final connections.

1.5 SCOPE OF WORK

A. The work covered by this Section includes the following:

- 1. Furnishes all food service equipment shown, including all labor, materials, tools and equipment necessary for the complete installation of kitchen equipment and refrigeration in a first-class manner, including all work incidental thereto in accordance with the drawings and these specifications.
- 2. Provide superintendent who, shall be devoted full time to this project during installation, shall be available to the other trades for verification of connection location, "etc." as needed, and shall direct, coordinate and supervise all work associated with this Section and inspects all equipment provided under this Section.
- 3. Provide equipment with threaded outlets for type of connections as standardized by Food Service Equipment Manufacturers for other contractors to make final steam, plumbing, electric and ventilating connections.
- 4. Provide all labor and material necessary to adequately insulate and seal any and all penetrations in Food Service Equipment. All penetrations are to be insulated and sealed properly to prevent condensation on inside of boxes.
- 5. Erect the equipment at the site in full compliance with all current local, state and Federal rules, regulations and codes.
- 6. Attend construction meetings and any other scheduled meetings as necessary to maintain coordination related to this Section.
- 7. Provide coordination of Food Service Equipment shop drawings, submittal data and installation activities, as required and identified in Division 1 Section "Project Management and Coordination"
- 8. All labor is to be performed in the best and most workmanlike manner. The standards of the work required are of such grade as will bring first class results. Materials and/or workmanship not in

compliance with the drawings and specifications or are improperly installed shall be removed and replaced with no change in contract price or other cost to the Owner.

9. Cleans up all debris resulting from the work of this Section immediately upon completion of installation and removes same from premises.
10. Field verify all measurements on-site (including shelving); verify the placement of pipes, sleeves, hood, pant-leg duct, drains, power, and walk-in wood breaker strip locations prior to the pouring of the floor slab or, if in an existing facility, prior to the installation of such services. Any modification necessary to the equipment because of the location of service connections must be brought to the attention of the Architect immediately for approval if the modifications require design changes. Measurements shown on drawings are approximate and are for estimating purposes only. Verify all electrical and mechanical requirements for all new, existing and future equipment with all appropriate trades, consultants, and engineers. Supplier of Food Service Equipment must examine roughed-in mechanical and electrical services. Notify the General Contractor in writing of unsatisfactory locations and dimensions of other work, and of unsatisfactory conditions for proper installation of Food Service Equipment. Do not proceed with fabrication or installation until unsatisfactory dimensions and conditions have been corrected. Any costs related to the failure of performing this function will not be borne by the Owner.
11. Verify all plug types and lengths of all cord and plug sets on equipment for which it is supplied. All cord sets are to contain an equipment grounding conductor and be furnished with caps or plugs listed or recognized by Underwriter's Laboratories.
12. Confer with the General Contractor on all measurements, location and measurement of recesses and openings, verification of all connection requirements, etc.; coordinate with the General Contractor the scheduling and transfer of all pertinent information (measurements, drawings, connection data, etc.,) to other trades who will be involved in the work associated with this Section.

B. Related Sections include the following:

1. Division 1 Section "Submittal Procedures" for submittal preparation and coordination.
2. Division 1 Section "Project Management and Coordination".
3. Division 22 for Plumbing/Piping Work
4. Division 23 for Ventilation Work requirements.
5. Division 26 for Electrical requirements

1.2 DEFINITIONS

- A. The term "Complete Installation" means the delivery of all kitchen equipment and refrigeration, with transportation and trucking charged prepaid to the building site, removal from crates, assembled, set in place, leveled, ready for final connection, re-leveled, calibrated, started-up and adjusted, cleaned, demonstrated, with Owner Training complete. All equipment to be cleaned using cleaners approved by and as recommended by the manufacturers to a condition of sanitation ready and acceptable for intended food service use. Equipment is cleaned just prior to Owner's acceptance.
- B. Work denoted as "Furnished By Others" (F.B.O.) or "By Other Trades" in Part 3, Equipment Schedule, in this Section will be furnished and installed under other Sections.
- C. Any reference to "standard" in Part 3, Equipment Schedule, in this Section is to be supplied whether or not it is identified as standard by the manufacturer.

D. GENERAL COORDINATION NOTE:

Utility sizes, connections and locations are based on the Food Service Drawings and Specified Equipment in Section 11 40 00. Alternates are listed BUT it is the responsibility of the Food Service Contractor to compare utilities between manufacturer specified, prime specification, and alternates listed. If alternate equipment is submitted for approval to the Architect by the awarded bidder and is different than prime specifications and has different utilities; it is the General Contractor and Food Service Contractor

responsibility for these changes and/or costs. There will not be ANY change orders approved after the bid for substitutions and/or cost associated with substitutions. This is a non-negotiable statement.

1.3 PERMITS AND LICENSES

- A. Pay all costs for permits, licenses, and fees, which are required for the work associated with this Section, and which may arise incidental to fulfilling of these specifications.

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Upon demand, provide evidence satisfactory to the Architect and Owner of having successfully completed Food Service Equipment projects of a size comparable to this one, and having sufficient experience in the work called for to assure completion of this project in a satisfactory manner. If requested, submit as a minimum the following information to the Architect within five days of receipt of request: Number of years in Food Service Equipment Industry; Key organizational personnel; Credit rating for this contract; Total amount of work under other contracts this date; Certificate of Licensing from State Licensing Board of General Contractors; past experience in the work called for to assure completion of the work in a satisfactory manner including names of projects, project contract amounts, scope of projects, names, addresses and telephone numbers of references of projects. If requested, submit evidence of sufficient financial resources for completion of this project.

2. The following Food Service Contractors are pre-approved for this project.

Birmingham Restaurant Supply, Inc. (BRESKO) 205.252.0076 / 800.344.2455
estimating@brescoinc.com
Mobile Fixture 251-342-0455/ Josh Sessions cell 251-422-7863
Joss.sessions@mobilefixture.com
Singler/H & R Division Office: 228-865-9095 Cortney Bates Cell: 601-502-4108
cbates@singerequipment.com
Dykes Restaurant 256-799-7029 / Billy Lynch cell 256-658-9609
blynch@dykesfoodservice.com

B. Custom Equipment Fabricators:

1. It is required that all fabricated equipment such as food serving units, tables, sinks, counter tops, etc., described in the following specifications, other than by name and catalog numbers, be manufactured by an equipment fabricator who has the plant, personnel, and engineering facilities to properly design, detail and manufacture high quality food service equipment. All work in the above category shall be completed by one manufacturer with standard unit assembly and uniform design and finish.

1.5 SUBMITTALS

- A. Submittal booklets, electronic, shall contain the following information:

Within 30 days after notice to proceed, and prior to equipment purchase, submit one (1) bound set and PDF copies on THUMB DRIVE of manufacturer's specification and data sheets, describing articles and equipment, as specified, for approval. Illustrations need not be manufacturer's original literature sheets. Each submittal must include manufacturer's literature for each item and a type written specification sheet showing item number, quality to be furnished, manufacturer's name, model number and list optional

finishes and accessories to be supplied. In addition, show plumbing and electrical characteristics and/or BTU rating and indicate if electrical cord and plug will be furnished. Material shall be assembled in order by item number as specified herein and brochure shall be complete and include all items. After approval, FSEC to provide six (6) bound sets to General Contractor for distribution to Owner, Architect and Engineers.

B. Shop Drawings, electronic, are required for the following:

1. All custom fabricated equipment including walk-in cooler/freezer, stainless steel fabrication and serving line units, dimensioned and drawn at a minimum scale of 3/4" to the foot, with necessary cross sections at a minimum scale of 1½" to the foot, showing complete detail for each item of specially fabricated equipment. Indicate name of manufacturer.
2. Separate mechanical and electrical rough-in drawings with dimensions showing rough-in locations and final connections for each piece of equipment with each connection shown giving size, height and an explanation with each connection cross-referenced to the specification sheets or shop drawings. Rough-in shall be drawn at a minimum scale of ¼" to the foot. Above finished floor dimensions are required. All electrical connections are to be water tight or located at a height to prevent water from entering. Coordinate height of rough-ins so as not to interfere with the sealing of tables, over shelves and sinks to the walls, etc., as well as at heights for the convenience of the operator. Verify heights required and coordinate with the other trades as required.
3. Service connections located under the exhaust hood must be located to provide the capture space as shown on the enlarged kitchen plan. Space between the backs of the equipment or between the backs of the equipment and wall must be maintained as shown when locating the service connection under the hood. For serving line units, location of floor drains and electrical outlets must be coordinated with the location of drains and cord and plugs on the units.
4. All convenience outlets and convenience drains are to be included on the electrical and mechanical rough-in dimensioned drawings.
5. Dedicated electrical service for computer is required in the manager's office. See electrical, mechanical and plumbing drawings for numbers and locations.
6. Exposed conduit, surface mounted disconnects, surface mounted panel boxes and surface mounted equipment control panels are not permitted unless indicated otherwise or with the permission of the Architect.
7. Provide dimensioned details, sections or elevations for all wall openings for equipment such as pass-thrus, dish machine, chutes, etc.; for all wall or floor recesses for equipment such as walk-in cooler/freezer, floor troughs, wash down system junction boxes and remote stations, waste system control panels, etc. All cross sections, elevations and details are to be drawn at a minimum scale of 1½" to the foot.
8. Provide a dimensioned food service equipment layout separate from the dimensioned electrical and mechanical rough-in drawings showing the placement of all equipment, including the ventilation hood. An itemized equipment schedule is to be included.
9. Provide an electrical and mechanical schedule identified by Item number and description showing the exact electrical and mechanical characteristics required for each item, including comments concerning final connections and interconnections. Power/fuel requirements, water/drainage requirements and similar information are to be included.
10. All drawings are to be based upon the food service equipment layout and itemized specifications. Drawings will include accurately dimensioned layouts and locations for all masonry bases, if required or called for, and will include accurately dimensioned details and locations of any special wall openings that are required for equipment extending through walls.
11. All rough-in connections located in walls are to be dimensioned to avoid any cove tile, stainless steel bases, shelves, table, counter tops, and backsplashes.

C. Submittal requirements are as specified in Division 1 Section "Submittal Procedures"

1.6 MATERIAL AND WORKMANSHIP

- A. Unless otherwise specified or shown on drawings, all material is to be new, of best quality, perfect and without flaws, and delivered upon completion in an undamaged condition.
- B. All workmanship is required to be the best of its respective kind. All labor to be performed in a thorough workmanlike manner by qualified, efficient and skilled mechanics.
- C. Equipment will be inspected after delivery and any equipment found not to be in accordance with specifications, drawings and/or approved shop drawings will be rejected and shall be replaced with the approved equipment ,with associated cost borne by the Contractor. Any defects found during inspection must be remedied to the satisfaction of the Owner and Architect.

1.7 STANDARDS

- A. All equipment shall be constructed in strict compliance with the standards of the National Sanitation Foundation (NSF) and in full compliance with the Public Health Regulations of the State in which installation is made. Each piece of equipment must bear "Seal of Approval" label of the National Sanitation Foundation, if applicable.
- B. Dish machines must conform to the latest adopted standards, and electrical and gas cooking and warming equipment must conform to the latest adopted standards, as established by the National Sanitation Foundation, Ann Arbor, Michigan.
- C. ANSI Standards: Comply with applicable ANSI standards for electric powered and gas burning appliances, for piping to compressed gas cylinders, and for plumbing fittings including vacuum breakers and air gaps to prevent back siphonage in water piping.
- D. NFPA Codes: Comply with the latest adopted NFPA Codes, "National Electrical Code", "Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment", and "National Fuel Gas Code".
- E. ASME Boiler Code: Construct steam generating and closed steam heated equipment to comply with the latest adopted ASME Boiler and Pressure Vessel Codes.
- F. All electrical equipment is U.L. Approved and Listed.
- G. All gas equipment is AGA Approved and Listed.

1.8 COMPLIANCE WITH LAWS AND CODE REGULATIONS

- A. Nothing in the Contract Documents shall be construed to conflict with any local, state or federal laws or regulations governing the installation or any part of the work to be performed under this Contract, and all requirements shall be in accordance therewith, without any additional cost to the Owner.

1.9 INSPECTION OF WORK

- A. The Owner, Architect, or their duly authorized representative shall have free access to the work covered by these specifications for the purpose of observation, in the shop, in storage and at the job site, of the work for conformance with the Contract Documents. Nonconforming work and/or equipment shall be corrected when

1.10 WAREHOUSING

- A. Because of the possibility of damage to the kitchen equipment, it is not shipped directly to the job site. It is shipped to the Food Service Equipment Contractor's warehouse and delivered and removed from crates by him. The one exception to this is the fabricated equipment which may be shipped at a time when the building is ready to receive it and which may be delivered direct to the job site. The delivery time is coordinated with the General Contractor to arrive at a time when it will not interfere with the operation of other contractors, but in time for the various tradesmen to make their final connections.
- B. Stored materials must be stored in an insured warehouse by the Food Service Equipment Contractor. The Food Service Equipment Contractor is totally responsible for stored equipment.
- C. Receipt, unloading, removal from crates, etc., is the sole responsibility of the Food Service Equipment Contractor.

1.11 ROYALTIES AND PATENTS

Food Service Equipment Contractor pays all fees and royalties for patented articles used under this specification.

1.12 WORK BY OTHER TRADES

- B. The work to be provided under other Sections includes roughing-in to points indicated on the mechanical, plumbing and electrical plans, final connections from rough-in point to various pieces of Food Service Equipment requiring such connections, final connection between various pieces of equipment or within pieces of equipment as required, and the supplying of all necessary materials, tools and labor for this work.
- C. Electrical Work performed under Division 26 includes the following:
 - 1. Interior wiring and/or control wiring in walk-in cooling equipment, wiring for lights in walk-in cooler/freezer units, sink heaters and ice cream makers.
 - 2. Electrical connections to compressors, blower coils, controls, lights, etc.
 - 3. Install all conduit and wiring for rough-in, final and inter-connections and makes all final connections within, between, and to Food Service Equipment.
 - 4. Wiring for lights in walk-in refrigeration equipment shall be run through conduit installed on the ceiling inside the boxes and not on the top of the boxes. See Installation Instructions, this Section for description of fasteners and use of mastic.
 - 5. Provide any sleeves required for power, controls or alarms.
 - 6. Furnish and install all disconnect switches, safety cut-outs, control panels, fuse boxes, or other electrical controls, fittings, and connections.
 - 7. Install motor starters and switches, which are furnished with Food Service Equipment.
 - 8. Install all cord and plugs, which are furnished loose with Food Service Equipment.
 - 9. Coordinate the installation of electrical components for Food Service Equipment so as to be in compliance with related local codes and regulations.
 - 10. Note that all electrical work related to this Section shall be in compliance with the requirements for WET LOCATION unless otherwise noted.
- D. Plumbing/Piping Work performed under Division 22 includes the following:
 - 1. Provide rough-in and make all final connections including all materials and labor for gas, water and waste within, between and to the Food Service Equipment.
 - 2. Install all faucets, lever waste drains, hose reels with mixing valves and gas pressure regulators, which are furnished with Food Service Equipment.
 - 3. Plumbing connections to compressors, blower coils.
 - 4. Provide any sleeves required for installation of refrigeration tubing or other piping.
 - 5. Piping extensions from fixtures to floor drains and floor sinks for walk-in refrigeration.

6. Flush all lines free of foreign matter before connecting fixtures.
7. Provides water supply piping, traps, check valves, water pressure reducing valves, vacuum breakers, tail pieces and fittings, waste piping, floor drains, gas pressure regulators, shut-off valves, and all other necessary fittings.
8. Provide back flow prevention devices required by regulatory codes and/or the Public Health Department, and install any back flow prevention devices supplied by the Food Service Equipment
9. Provide half drain covers on floor drains or floor sinks for free flowing drain connections where required to prevent water from splashing on surrounding floor and/or equipment.

E. Ventilation Work performed under Division 23 includes the following:

1. Furnishes and installs necessary ventilation facilities of sufficient capacity to operate the equipment.
2. Furnishes and installs required vent ducts and transitions, and exhaust hood fans, and connects to equipment.
3. Note the ventilator shown in drawings is approximated size of ventilator capture area only.

F. General Work performed under Divisions 3 through 9

1. Provide a finished floor that is level unless noted otherwise in the Itemized Specifications or on the enlarged Food Service Equipment drawing. Floors are not pitched to drains because of the extensive use of mobile equipment. Leveling of the floor surface in the serving area, under Pass-Thru Refrigerated and Heated Cabinets, under the hood and in the walk-in Cooler/Freezer recess is critical. Equipment in the serving area are equipped with casters and cannot be leveled except by the floor and will not lock together if the floor is not level.
2. Provides all openings and penetrations in walls, ceilings, roofs, etc., for the food service equipment as required and finishes such openings as specified on the Construction Documents

1.13 ENVIRONMENTAL PROTECTION

- A. It is the intent of these specifications to exclude all substances which are potentially hazardous.
- B. The Food Service Contractor is to be aware of this intent and verify through his suppliers and manufacturers that all materials and products provided for this facility are free of known environmental hazardous substances including formaldehyde and asbestos related materials. No such materials shall be installed, even on a temporary basis in any location of the project.

PART 2 - PRODUCTS

2.1 EQUIPMENT MANUFACTURERS

- A. Manufacturers: The equipment specified in Part 3, Equipment Schedule, shall be construed as a **basis-of-design** product and as such sets forth not only quality, standard/optional features but also equipment connection requirements. Acceptable equipment manufacturers shall be listed on a per equipment item basis. Due to the variations of equipment connection requirements from manufacturer to manufacturer the Food Service Equipment Contractor shall be responsible for the following when providing a listed acceptable equipment manufacturer other than the basis-of-design product.
 1. Food Service Contractor shall make the General Contractor aware of any differences in connection requirements, including but not limited to the following:
 - a. Electrical amperage.
 - b. Waste connections and volume.
 - c. Water (hot and cold) connections and volume.
 - d. Exhaust connections and volume.
 2. The Food Service Contractor shall provide, at no additional cost to the Owner, any equipment characteristic considered as a standard on the basis-of-design product but considered as an optional characteristic on the listed acceptable equipment manufacturer.

2.2 FABRICATED EQUIPMENT

- A. The material used in manufacturing equipment shall be as hereafter specified. Material that is not definitely specified shall be of the best quality used for its specified or intended purposes. All materials shall be new and free from all defects and imperfections. All fabricated equipment in this specification shall be custom built by a fabricator who has a complete factory with suitable equipment, personnel, and engineering facilities to properly design, detail, and manufacture the highest quality of food service equipment. All fabricated equipment shall conform to the current standards of the National Sanitation Foundation (NSF), Ann Arbor, Michigan. All fabricated equipment shall bear the NSF seal applied before delivery to the job site.
- B. Where not defined in Itemized Specifications all General Specifications and Sections take precedent.
- C. Deviations or changes from the General Specifications for Fabricated Equipment are found in Itemized Specifications.
- D. Where units cannot be fully shop fabricated; fabrication shop shall complete fabrication work at project site.
- E. Food Service Equipment Contractor is required to make all field measurements and dimensions and deliver and install all fabricated equipment. Measurements are made wall to wall. Fabricator to allow ¼" for fit.
- F. Electrical Specifications
 1. Motors up to and including ½ H.P. are wired to 110, 115, or 120 volts, single phase. Motors over ½ H.P. are wired for 208 or 220 volts, three phase, unless otherwise noted on Architect's plans or in the Itemized Specifications.
 2. Heating Elements having a connected load up to and including 1,000 watts are wired for 110 or 220 volts, single phase. Any heating element over 1,000 watts or any combination of heating elements within one fixture totaling more than 1,000 watts is wired for 208 or 220 volts, single phase, unless otherwise noted on Architect's plans or in the Itemized Specifications. All units are wired to a single master switch.
 3. Provide 480 volt, three phase power where called for in the Itemized Specifications or as noted on Electrical drawings.
- G. Switches and Controls
 1. The Food Service Equipment Contractor supplies for each motor driven appliance or electrically heated unit, a suitable control switch or starter of proper type in accordance with Underwriter's Code. Controls that are mounted on vertical surfaces of fabricated fixtures are set into recessed die stamped stainless steel cups or otherwise indented to prevent damage.
 2. All internal wiring for fabricated equipment items, including all electrical devices, wiring controls, switches, etc., built into or forming an integral part of these items are furnished and installed by Food Service Equipment Fabricator in his factory with all items wired completely to a junction box within the fixture ready for final connection to building lines. All receptacles are grounding type listed by Underwriters Laboratories and approved by National Electrical Code. A standard three-prong plug to fit "U" slot grounding type receptacles is provided for all equipment operating off a 110 or 120 volt single phase A.C. electrical outlet. A three-wire cord of suitable length is provided for this equipment as well. All cord sets are to contain an equipment grounding conductor and be furnished with caps or plugs listed by Underwriter's Laboratories.
- H. Faucets, Valves, and Fittings
 1. Food Service Equipment Contractor furnishes all faucets and lever waste drains. Sinks are fitted with faucets as called for under each item or as separate item listed as faucets. All special faucets for kettles, pre-wash, etc., are listed under Itemized Specifications.

2. Faucets are properly tagged with item numbers and delivered to Plumbing Contractor on job for installation. Mounting of faucets to fixtures is responsibility of Plumbing Contractor. Lever waste drains are installed into bottom of sinks by Food Service Equipment Contractor.
 3. Faucets and hose and spray units with a mixing valve shall be provided with internal spring checks to prevent cross flow of water. If mixing faucet is attached to hose and spray unit with back flow prevention device, the faucet may have to be modified with a spring check spindle and/or check valves provided to prevent cross flow of water. Back flow prevention devices must be compatible with base unit and meet Public Health Code. It is the responsibility of the Food Service Equipment Contractor to verify the Public Health requirements and supply back flow prevention devices accordingly.
 4. All other fittings, such as stops, shut-offs, trap valves, etc., furnished and installed by Plumbing Contractor.
 5. Openings for faucets and spray units are located by the Fabricator to prevent handles from hitting splash when in the fully open position.
- I. Non-Corrodible Alloy
1. Non-Corrodible alloy, or stainless steel, specified hereafter are Type 304 stainless steel, having a standard analysis of 18% chrome and 8% nickel and .08% carbon steel.
 2. All gauges, where specified, are United States Standard gauges. All exposed surfaces are given a #4 finish 180 grit. Where manufacturing process and welding disturb the original finish, it is carefully reground, polished and restored to match balance of surface. All gauges, not specified, are United States Type 304, 18-8, 14 gauge stainless steel.
- J. Galvanized
1. Where galvanized iron is specified, tight coat galvanized Copper Bearing is furnished in largest possible sheets with as few joints as necessary. The sheets are of an approved grade, re-rolled for smoothness.
 2. Paint with hammertone grey enamel which meets U.S.D.A. criteria unless specified otherwise. Underbracing is not painted with hammertone grey enamel.
- K. Welding
1. All welding of stainless steel, whether specified or implied, is accomplished by the heli-arc method using stainless steel rod of the same composition as the parts welded. Welds are ground smooth and polished to the original finish of the metal, with the grain uniform to the grain of the original sheet. The stainless steel welds are free of pits, flaws, discolorations, and peened to remove flux and impurities. Where the grinding and polishing have destroyed the grain, restore and blend to obliterate all traces of welding. Welds are ground back to the surface of the original metal and sealed. Acetylene welding will not be accepted. Solder will not be accepted. Shop seams and corners in stainless steel tops shall be welded, ground smooth and polished.
 2. All welds of galvanized metal on dish tables and sinks shall be ground smooth and sandblasted and sprayed with molten zinc at 1200 Fahrenheit to a .004 thickness. Tinning of welds is not acceptable.
- L. Pipe Stands and Frames
1. All pipe stands for work tables, open base tables, dish tables, sinks and drainboards are constructed of 1-5/8" O.D. stainless steel tubing (16 gauge, type 304) or as indicated in the Itemized Specifications. All stringers and cross bracing are of same material as legs. All joints between legs and cross braces are notched, welded and ground smoothly. Legs fitted at top with fully enclosed stainless steel gussets welded to angle underbracing and stud bolted to top. Legs are attached without the use of bolts and are spaced on maximum of 4' to 5' centers.
 2. Crossrails are supplied between each leg. Legs anchored to closed gussets at top only and without crossrails are not acceptable. Constructed of 1-5/8" O.D. stainless steel tubing (16 gauge, type 304).
 3. All crossrails are 12" O. A. above floor, or as called for by local health authorities. Verify that height of crossrails does not interfere with service connections.

M. Bracing

1. Bracing is 12 gauge 1" X 4" X 1" galvanized iron channels and 12 gauge 1½" X 1½" X 1/8" galvanized iron angles. See Table Top section for attachment. Amount of bracing provided is as required to reinforce to prevent noticeable deflection. Tops of work tables, dish tables, enclosed base tables, serving counters and drainboards are braced. Clear silicon caulking manufactured to with stand 400° F. temperature water is applied at seam between bracing and tops.
2. Exposed underbracing is 14 gauge, type 304 stainless steel.

N. Sound Deadening

1. Furnish sound deadening pads to break metal to metal contact between bracing and tops on all work tables, dish tables, sinks, drainboards, enclosed base tables and serving counters except where noted otherwise.
2. Furnish sound deadening pads on underside of all sinks including pre-wash and disposal sinks, dish tables, drainboards, and underside of all tables between bracing.
3. Double walled sliding and swing doors are fitted with sound deadening insulation between the walls.

O. Feet

1. All pipe legs are fitted with sanitary die stamped stainless steel bullet shaped feet, fully enclosed with a slightly rounded bottom to protect the floor. Top of these feet are fitted with a male threaded stem to fit into the end of pipe legs hereinabove specified and provide a total adjustment of 1". Stem is extra long so threads are not exposed. Bottom of pipe leg is finished off smoothly and overlap stem to provide sanitary fitting and prevent accumulation of grease or other debris at this joint.
2. Cabinet type fixtures are mounted on 6" high die stamped sanitary one piece stainless steel legs and adjustable feet not less than 3" in diameter at top. Bottom adjusting member to telescope up into inside of upper member and match adjuster on open base units. Legs are fitted with a male threaded stem and have an adjustment of 1" on the 6" high legs. The upper part is stamped in a neat design with flared inverted shoulder, welded to stainless steel base plate designed for anchoring to channel braces below cabinet type fixtures.

P. Table Tops (Metal)

1. Metal table tops are made of 14 gauge stainless steel. See Itemized Specifications for description of edge. Shop seams and corners are welded, ground smooth and polished. Working tops are reinforced on the underside with a framework of 12 gauge 1" x 4" x 1" galvanized iron channel and 1½" x 1½" x 1/8" galvanized iron angles as required. All horizontal and vertical cove corners on a ¼" or larger radius. Height of table top is 34".
2. Tops are reinforced so there will be no noticeable deflections, with reinforcements stud welded to underside of top. Rivets or bolts used through the top are not accepted. Reinforced with 12 gauge 1" x 4" x 1" galvanized iron channel and 1½" x 1½" x 1/8" galvanized iron angles. Bracing is stud bolted to underside of top with cadmium plated lock nuts. Sound deadening pads are applied to break metal to metal contact between all bracing and underside of top.
3. Field joints are provided in tops where necessary, located for practical construction and consistent with sizes convenient for shipping and accessibility into buildings. See section entitled "Field Joints" for description of these joints.
4. See Itemized Specifications for description of edge.

Q. Dish Table Tops

1. Tops of dish tables are constructed of 14 gauge stainless steel with all free edges turned up 3" and finished with 1½" diameter sanitary rolled rim. Sides and back adjacent to walls or higher fixtures are coved up 8", returned 2½" on a 45° angle, turned straight back ¾" and straight down ½" along wall edges to an overall height of 10". Table is attached to wall with 12" stainless steel strips (Z clips). All interior horizontal and vertical corners are coved on a ¼" or larger radius. Outside radius of rolled rim corners is concentric with inside cove. Top is reinforced, braced and sound deadened the same as Table Top.

2. Dish Table Tops are mounted on tubular stainless steel legs and adjustable feet with connecting rails the same as specified for pipe stands and frames.
3. Ends of splash are closed. Free corners of tops are spherical.
4. Legs are fitted with adjustable stainless steel bullet feet as described under feet.
5. Field joints are provided in tops where necessary, located for practical construction and consistent with sizes convenient for shipping and accessibility into buildings. See section entitled "Field Joints" for description.

R. Drawers

1. Drawer housing is fully enclosed and is made entirely from 18 gauge 304 stainless steel including any reinforcements, 24" X 24" X 8", or as called for in Itemized Specifications.
2. Internal drawer slide assembly is removable. Drawer slide assembly is stainless steel full extension drawer slides with stainless steel bearing wheels and screws: Standard-Keil 1452 series or Component Hardware Group Inc. S52 series.
3. Drawer face is of 14 gauge stainless steel. Face equipped with an integral handle across the entire top of the drawer.
4. Drawer pan is die drawn with fully coved corners from one piece of 18 gauge 304 stainless steel, 20" X 20" X 5" deep or as called for in the Itemized Specifications. Top edges to flange out 1½". Interior horizontal corners of the pan are rounded on a 1" radius and interior vertical corners of the pan on a 2" radius. The use of solder or other material to fill in these corners is not acceptable.
5. Apply 1/8" mastic sealant between drawer flange and work surface.
6. Tier of drawers is constructed in same manner as single drawer.
7. Drawers over 5" deep provided with drain hole and cap in front.
8. Each drawer mounted on a mobile unit contains (2) concealed magnetic latches with a minimum release tension of twenty pounds located at rear of drawer.
9. Single drawer and top drawer in tier of drawers are fabricated with a trough protector (gutter) to prevent entry of moisture.

S. Undershelves

1. The undershelves on open base tables are solid removable type of 16 gauge stainless steel.
2. Shelf is made in removable sections with rolled down edges on sides which overlap pipe crossrails where they abut same.
3. Abutting sections of shelves are turned down 1" straight.
4. Shelves are notched to legs of table.
5. Size of shelf is fabricated in sections for easy handling and for sending through dish machine.

T. Elevated Shelves

1. Elevated shelves constructed of 14 gauge stainless steel.
2. Shelf is mounted on 16 gauge 1-5/8" O.D. stainless steel tubular supports. Shelf is 12" wide unless stated otherwise; height is 18" and shelf is supported by cantilever supports mounted through the splash and into gusset welded to table bracing. Gusset fitted with set screw.
3. Three supports are required for shelves four to eight feet in length. One additional support is required for each additional three feet over eight feet in length as a minimum.
4. Front and sides have a marine edge. Back side is turned up 90° 2", returned ½" on a 45° angle, turned straight back 5/8", straight down 5/8" and hemmed. Shelf backsplash is capped at both ends. When elevated shelf is attached to a wall, 12" stainless steel "Z" clips and clear silicon caulking that will withstand 190° F. temperature water are used in order for shelf to be attached to wall. Elevated shelf on mobile units is never attached to wall regardless of location.
5. A minimum of ½" of insulation is required to separate heat lamps and shelf when lamp is installed underneath shelf.

U. Sinks

1. Sinks are of the size called for, constructed of 14 gauge stainless steel, type 304 (18-8), #4 finish. Backs, bottoms and fronts shall be formed of one continuous sheet with ends welded in place. Compartment sinks have double wall partitions of same material as sink.

2. Vertical and horizontal corners, including partition, are coved $\frac{1}{2}$ " or larger radius, electrically welded, ground smooth and polished.
3. Top edges of sinks at front and ends, except where fitted with integral type drainboards, are furnished with a $1\frac{1}{2}$ " die formed integral sanitary roll rim.
4. Across back of sinks, unless otherwise specified, there will be a 10" high backsplash at walls. When sink adjoins side walls, unless otherwise specified, there will be a 10" high sidesplash. Back and sides, where applicable, are coved up 8", returned $2\frac{1}{2}$ " on a 45° angle, turned straight back $\frac{3}{4}$ " and straight down $\frac{1}{2}$ " along wall edges to an overall height of 10". Sink attached to wall with 12" stainless steel strip (Z clips). Faucet holes are provided in backsplash 4" down from top. Faucet holes are centered over single compartment sinks and centered over partitions on multi-compartment sinks. Where roll terminates into backsplash the roll is fully welded and polished thereto. Ends of splash are fully enclosed, integrally welded, finished and polished and fully sealed by welding to meet NSF requirements unless specified otherwise. Sinks not adjacent to wall are equipped with backsplash that is fully enclosed, integrally welded, finished and polished and fully sealed by welding. Access openings are provided by the fabricator in the top and bottom of the enclosed backsplash for piping for faucets and vacuum breakers. Rubber grommets are supplied to seal between the piping and the edge of the openings to prevent corrosion between dissimilar metals.
5. Sinks are 37" high to top of roll, 34" AFF to deck and 14" deep from top of roll to bottom of compartment unless specified otherwise.
6. Bottom of each compartment is die-stamped with tapered grooves at least $\frac{1}{4}$ " deep at drain depression. Each compartment is provided with 2" lever type drain. Drain is fitted with rod lever for opening and closing drain. Each rod handle is suitably braced to bottom of sink with 16 gauge stainless steel bracket. All other components are nickel plated to match stainless steel. Drain is equipped with solid stainless steel handle assembly. Strainers are flat type made of stainless steel and snap-in. Drains have positive sealing action with heavy wall cast bronze body and self-centering face flanges.
7. Bodies are mounted on 1-5/8" O.D. tubing legs of 16 gauge stainless steel and fitted with stainless steel bullet type adjustable feet. Legs are mounted with 16 gauge stainless steel fully enclosed gussets fully welded to the sink bottom. See Pipe Stands and Frames and Feet sections.
8. Crossrails are 1-5/8" O.D. stainless steel tubing located 12" from floor; running front to back on legs forming a "H" frame unless specified otherwise. See Pipe Stands and Frames section. Locate crossrails to the front of the sink compartments. Coordinate height of crossrails and location of legs to avoid interference with sink heater controls.
9. All three-compartment sinks with drainboards longer than 27" to have six (6) legs unless specified otherwise. All three-compartment sinks with drainboards 27" or shorter to have four (4) legs mounted underneath sink body at corners. All drainboards longer than 27" require legs. If sink heater is specified for three-compartment sink with drainboards longer than 27", crossrail is located in front of drainboard adjacent to sink heater and rear of drainboard opposite of sink heater. If sink heater is not specified for three-compartment sink with drainboards longer than 27", crossrails are located at rear of drainboards.
10. In compartment with a sink heater, move the sink drain toward the side opposite the heater.
11. All three compartment sinks have 24" X 27" compartments with an overall width of $31\frac{1}{4}$ " unless specified otherwise. Compartment size must accommodate 18" X 26" sheet pans for total immersion.
12. Overall length and width is noted in the Itemized Specifications.
13. Bracing and sound deadening are the same as for table top.
14. Sound deadening pads are furnished on underside of sink compartments and drainboards.
15. Coordinate with Plumbing Contractor for location of faucet and vacuum breaker and provide knock-outs for same.
16. Provide rubber grommets for openings through which plumbing lines are routed to prevent dissimilar metal from touching. Label and deliver to Plumbing Contractor for installation.

V. Sink Inserts

1. Sink inserts are fabricated with no visible seams, size as called for, and constructed of 14 gauge stainless steel.
2. Sinks are welded integral with counter tops with no lap between.
3. Corners, partitions, bottoms and drains, sound deadening, etc., as specified under section entitled "Sinks".

W. Sink Drainboards

1. Drainboards are constructed of same material as sinks and welded integral to same. Drainboards to have 1½" high rims with die formed integral rolled edges to match sink edges. Horizontal and vertical corners are coved on a ¼" or larger radius, electrically welded, ground and polished to a #4 finish. Solder filling of these corners is not acceptable. Drainboards are pitched to properly drain into sink. (Minimum pitch in top of drainboards is 1/8" per foot from end of drainboard to sink compartments).
2. Across backs and ends against walls or high fixtures, drainboards have a 10" high backsplash and sidesplash, when applicable, to match splash of sink compartment. Backsplash and sidesplash, when applicable, are welded integral with splash of sink compartment with ends fully enclosed, integrally welded, finished and polished and fully sealed by welding. Attached to wall with 12" stainless steel "Z" clips. See description for exposed backsplashes and sidesplashes this Section for specifications for drainboards not attached to wall.
3. Sink and drainboards are constructed so that the rolled rims on drainboards are continuous and at the same height of 34". Where drainboards are longer than 27" in length, they are supported on pipe legs of same material as used for sink legs and cross braced above the floor with pipe rail. See Pipe Stands and Frames section.
4. Drainboard underbracing is 1½" x 1½" x 1/8" 14 gauge, type 304 stainless steel stud bolted to top. Sound deadening pads applied between angles and top and on underside between angles.

X. Edges

1. Marine edge.
2. Bull nose marine edge.
3. Bull nose edge.
4. Inverted rolled rim.
5. Standard table edge.
6. Flat turndown edge.
7. Standard roll rim edge.
8. Rolled table edge.

Y. Back, Sidesplashes

1. Back and sidesplashes cove up per drawings and specifications, return 2½" on a 45° angle, turn straight back 3/4" and turn straight down ½". If adjacent to wall and non-mobile, attach to wall with 12" stainless steel strip (Z clips).
2. Sides of sidesplashes and ends of sidesplashes are fully enclosed, integrally welded, finished and polished and fully sealed by welding to the top to meet NSF requirements unless specified otherwise. Use of silicon cannot be used to seal sidesplash on the outside but is one continuous piece. Sidesplash adjacent to wall is coved up 8", returned 2½" on a 45° angle, turned straight back 3/4" and turned straight down ½" to an overall height of 10" and attached to wall with 12" stainless steel strip (Z clips). End is fully enclosed, integrally welded, finished and polished and fully sealed by welding to the top.
3. Ends of backsplash are fully enclosed, integrally welded, finished and polished and fully sealed by welding to the top to meet NSF requirements unless specified otherwise.
4. Backsplash and sidesplashes for mobile equipment or equipment not adjacent to wall are fully enclosed, integrally welded, finished and polished and fully sealed by welding to the top and sides to meet NSF requirements unless specified otherwise. Use of silicon cannot be used to seal splashes on the outside but is one continuous piece. Access openings are required in fully enclosed backsplash by the fabricator through the top and bottom of the backsplash for equipment requiring piping for faucet and vacuum breaker. When applicable, removable 16 gauge, Type

304, 18-8 stainless steel enclosure panel (skirt) is supplied and installed at back of equipment below backsplash to cover exposed electrical and plumbing connections. Equipment attached to wall with "Z" clips does not have an enclosed backsplash but backsplash is turned down next to wall ½". End is fully enclosed, integrally welded, finished and polished and fully sealed by welding to the top.

5. All fully enclosed backsplashes and sidesplashes extend down to counter or table top or below in order to cover all underbracing.
6. In instances where backsplashes and sidesplashes are attached to the walls and are not fully enclosed, exposed underbracing is 14 gauge, type 304 stainless steel.

Z. Casters

1. All casters are 5" with brake unless specified otherwise.

AA. Field Joints

1. Field joints are located for practical construction, consistent with sizes convenient for shipping and accessibility into building.
2. Field joints in tops are carefully sheared so they can be tightly butted and joined together to form an integral unit to match balance of equipment.
3. Field joints and butte joints are heli-arc welded, ground and polished smoothly. These joints are made by the approved fabricator.

BB. Refrigeration Service

1. Refrigeration service includes start-up and all parts; service, parts, mileage, transportation and labor warranty for one year from the date of final acceptance by the Owner and a five year non-prorated compressor replacement warranty from the date of final acceptance by the Owner.

CC. Painting

1. All fixtures, unless made of stainless steel, are finished with hammertone grey paint of the highest quality, air-dried and applied in accordance with the manufacturer's direction.

DD. Joints, Finishes and Trim Strips

1. All equipment is formed of one piece of material wherever possible, with due regard to shipping and erection.
2. All joints, where necessary, are homogeneously welded by electric fusion metal arc, using welding rod of same composition as material being welded, ground smooth and polished to an invisible joint to match adjoining surfaces.

EE. Definition

1. "Fully" is defined as continuously. Stainless steel gussets are fully (continuously) welded.

FF. Sealing

1. Any gaps or crevices such as the seam between under bracing and top are fully (continuously) sealed with sealant as described in this Section.
2. Supply and install rubber grommets for all openings through which dissimilar metals pass such as piping for disposal vacuum breaker in soiled dish table.

GG. Coordination

1. Provide copy of specification sheet or shop drawing for integral equipment such as dish machine, waste system, disposal, booster heater, etc. to fabricator for use in preparing submittal drawings.

HH. Approved Fabricators

1. Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are:
Atlanta Custom Fabricators
Low Temp Industries

2.3 GENERAL MANUFACTURING NOTES FOR ALL EQUIPMENT

- A. Water inlets are located above positive water level to prevent syphoning of liquids into the water system. Wherever conditions require a water inlet placed below the water level, Food Service Equipment Contractor supplies suitable type of vacuum breaker or back flow prevention device for the fixture to form part of same to prevent siphoning; labels and delivers to Plumbing Contractor for installation. Food Service Equipment supplier is required to furnish back flow prevention device as required by the Public Health Department for any piece of equipment supplied. It is noted that Public Health Departments usually require back flow prevention device on water inlet for Convection Combo type units. All back flow prevention devices must be acceptable to the Public Health Department.
- B. Food Service Equipment Contractor supplies all faucets, spray and hose units with mixing valves and cross flow prevention devices if supply through unit is hot and cold water and all hose and spray units with back flow prevention devices. Face for all spray units is stainless steel. See description of Faucets, Valves and Fittings this section. Parts are labeled and delivered to Plumbing Contractor for installation.
- C. Suitable pipe slots are provided through all undershelves to accommodate necessary service lines. These slots are proper size and are neatly made with turned up edges on all four sides to eliminate cutting or defacing of equipment on job. Cabinet bases are provided with an inner panel duct at ends or rear of cabinet to allow enclosed vertical and horizontal pipe space to conceal the vertical and horizontal piping.
- D. All hardware, including that used for refrigerators, is heavy-duty cast type and arranged for locking device. Mounting screws are stainless steel or non-corrosive. Hardware is specifically selected for the particular use to which each piece is intended. Mastic required between non-similar metals to prevent rusting.

PART 3 - EXECUTION

3.1 EQUIPMENT DELIVERY

- A. Equipment is not to be delivered, removed from crates, set-in-place for final connections until as a minimum all painting has been completed; ceilings, hood and ventilation duct work are in place; floor is cleaned; and all rough-in connections are in place. Site must be ready for final connections

3.2 INSTALLATION

- A. Where there are gaps or spaces over 1/8" between walls and equipment, at tops of backsplashes, between adjoining pieces of equipment, etc., necessary trim strips are furnished for the proper finishing in installation. Necessary measurements for trim strips are taken during the time of installation in order to afford proper fit. Wall trim is made generally from 22 gauge Type 304, 18-8 stainless steel, broke to provide a tight fit. Trim is attached to backsplash (metal) with adhesive. Exposed fasteners may not be used to attach trim to metal backsplashes. In all other instances stainless steel fasteners may be used to attach trim to walls and equipment if equipment finish is stainless steel. Non-corrosive fasteners are required if equipment finish is not stainless steel. Fasteners supplied and installed by other contractors to attach conduit and other materials to the Food Service Equipment must meet the preceding specifications. Trim is sealed to wall and equipment with clear silicon caulking; see installation requirements this Section.

- B. Install closure plates and strips where required, of same material as equipment with joints coordinated with units of equipment. Joints are sealed with clear silicon caulking; see description of caulking types, this Section.
- C. Install insulation where indicated by industry standards and sealants and gaskets all around each unit and penetration or as required to make joints air-tight, waterproof, vermin-proof and sanitary for cleaning purposes. In general, clear silicon caulking is the sealant. In general, make sealed joints not less than 1/8" wide and stuff with backer rod to shape sealant bead properly, at 1/4" depth. Shape exposed surfaces of sealant slightly concave, with edges flush with faces of material at joint. Anchor gaskets mechanically or with adhesives to prevent displacement.
- D. Conduit seal-offs required for penetrations into walk-in cooler/freezer.
- E. Mastic is required between fasteners and equipment or trim and equipment when non-similar metals are used to prevent rusting through electrolysis. Rubber grommets are required where plumbing lines and connections penetrate splashers to prevent corrosion. Food Service Equipment Contractor supplies, labels and delivers rubber grommets to Plumbing Contractor for installation.
- F. All single or multiple compartment sinks and tables with single or multiple compartment sinks are attached to the wall with 12" stainless steel strips (Z clips) and sealed with clear silicon caulking if located adjacent to wall.
- G. Top shelf on all shelving and shelving/platform units unless noted otherwise is installed even with the top of the posts.
- H. Air curtain devices shall be adjusted to regulate the velocity and volume of air at the air outlet for the purpose intended.
- I. One hundred percent clear silicon caulking approved for use with food and rated to withstand temperatures up to 400° F. is used when caulking comes in contact with 190° F. water. General Electric sealant SCS 1000 and SCS 1200 and Component Hardware Silicone Sealer are the standards.
- J. Caulking required with glass, copper, mill finish aluminum, galvanized steel, many plastics, stone, concrete and masonry finishes and rated to withstand temperatures up to 400° F. is General Electric sealants, Silglaze N or Gesil N depending upon the cure time required and the color specified. These sealants are only used with non-food contact surfaces. Examples: Floor level, trim at dish room openings and pass-thru openings.
- K. Light fixtures over the door frames of walk-in refrigeration boxes are installed at a height sufficient to accommodate installation of strip curtains, if specified.
- L. All thermometers, timers, thermostats for all equipment is tested and calibrated to proper operating conditions.
- M. The equipment under the hood is positioned to allow for proper capture. Refer to drawings. Food Service Equipment Contractor is responsible for coordinating with all other contractors the proper locations of service connections under the hood to maintain floor space for equipment and the space in front of and behind or between the equipment under the hood as shown on the Food Service Equipment (Kitchen) Plan.
- N. Food Service Equipment Contractor is responsible for coordinating the placement of the hood to maintain working aisle spaces.
- O. If sprinkler heads are installed inside walk-in cooler/freezer box, Food Service Equipment Contractor is responsible for insulating and sealing penetrations properly to prevent condensation and ice formation.

3.3 QUALITY AND GUARANTEE

- A. All equipment is guaranteed by the Food Service Equipment Contractor to be free from defects in workmanship and/or material for a period of one (1) year from the date of substantial completion of same by the Architect and Owner. This guarantee covers replacement of defective material at Food Service Equipment Contractor's expense, including parts, mileage, service, transportation and labor, but it does not cover any cost whatsoever for replacement of parts or work made necessary by carelessness or misuse of equipment. All Refrigeration units have a five (5) year non-prorated replacement warranty on the compressor from the date of substantial completion of same by the Architect and Owner. Extended warranties are specified in the Itemized Equipment Specifications, this Section.

3.4 TESTING AND START-UP INSTRUCTIONS

- A. After all utility connections to equipment have been made by other contractors, Food Service Equipment Contractor starts-up, adjusts, levels and calibrates all equipment. Calibrate all thermometers, timers, and thermostats. After start-up and adjustment Food Service Equipment Contractor conducts final test of equipment before requesting first inspection by Architect and his Food Service Equipment Consultant.
- B. Delay start-ups of food service equipment until service lines have been tested, balanced, and adjusted for pressure, voltage and similar considerations, and until water and steam lines have been cleaned and treated for sanitation by other Contractors.
- C. Test each item of operational equipment to demonstrate that it is operating properly, and that controls and safety devices are functioning. Repair or replace equipment which is found defective in its operation, including units which are below capacity or operating with excessive noise or vibration.
- D. Walk-in Cooler/Freezer refrigeration systems to be run **five consecutive** days prior to equipment demonstrations.
- E. Provide a training program by a Serve Safe certified culinary chef and/or factory representative to consist of one (1) 6 hour day at startup showing all equipment and how it works with demonstrations. Provide training as follow up in another one (1) 4 hour day program within 45 days of start of school. Trainer shall monitor employees and demonstrate how to properly use equipment with live cooking. Service provided shall include abbreviated classes in Serve Safe and HACCP, and the proper method for receiving and storing product. Training to consist of a total of eight (8) hours. Notify GC and Architect of scheduled dates, time and name of Chef with contact info.
- F. Contractor shall issue a letter, signed by all sub-contractors involved and co-signed by Owner's representative stating that CNP staff have been satisfactorily instructed in the use of the equipment.

3.5 MANUALS FOR OWNER-UPDATE 10.30.2024

- A. Food Service Equipment Contractor, upon completion of work, to deliver to the Architect's Food Service Consultant for review three (3) thumb drives with all operation manuals in alphabetical order for all mechanically operated equipment i.e. cooking equipment, serving line operations and dishwashers. (hard copies of these manuals is no longer required).
- B. Food Service Equipment Contractor, upon completion of work, to deliver to the Architect's Food Service Consultant for review three (3) sets of the following:
 - 1. Warranty statement indicating date of start-up for equipment. Note if equipment has more than the standard one (1) year warranty and if so what is the warranty period.
 - 2. Names and addresses of manufacturers supplying the equipment.
 - 3. List of authorized service agencies including name, address and telephone number.

4. Service information organized in a chart format, alphabetically by manufacturer, item description, manufacturer, model, electrical and mechanical characteristics, and serial number.
 5. As built shop drawings for all custom equipment.
 6. Floor plan, plumbing and electrical rough-in drawings and equipment schedule marked as built. Show any variations from the original drawings.
- C. Organize and assemble all information into three individual hardback vinyl loose-leaf binders. Binder to include two pocket folders for folded sheet information. Mark the appropriate identification on both the front and spine of each binder. Binder for site has identification as such on the front and spine.
 - D. Organize drawing sheets into manageable sets, bind with durable paper cover sheets and print suitable titles, dates and other identification on cover of each set.
 - E. Manuals are assembled and ready to use during demonstration and training.
 - F. After review and approval of manuals by the Architect, manuals are transferred to Owner or Owner's representative.

3.6 GENERAL OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Food Service Equipment Contractor shall furnish qualified representatives to instruct and demonstrate to the Owner's Personnel, at project site, the proper operation, care and maintenance of all equipment involved including the care of finished surfaces. The dates and times of the demonstration shall be coordinated with the Owner's Personnel. Food items supplied by the Owner are prepared during training by the food service employees utilizing the equipment. Food Service Equipment Contractor identifies to the Owner the food items and supplies required for training at least one week before the scheduled training date. All equipment to be demonstrated must be fully operable before training; all final connections must be made and start-up and adjustment completed.
- B. It is noted that for the purposes of scheduling that all contractors must be completed with their work within the kitchen and or serving area prior to equipment demonstration and training.
- C. As part of this instruction, provide a review of the information assembled in the Operation and Maintenance Manuals and the following items which are not inclusive:
 1. Maintenance Manuals
 2. Operation Manuals
 3. Tools
 4. Spare parts and materials
 5. Lubricants
 6. Fuels
 7. Identification system
 8. Control sequences
 9. Hazards
 10. Cleaning
- D. For operational equipment also demonstrate:
 1. Start-up
 2. Shut-down
 3. Emergency operations
 4. Safety
 5. Effective energy utilization
- E. Review maintenance and operations in relation with applicable warranties.

- F. The Food Service Equipment Contractor shall provide a qualified representative to be on site during demonstration and training of all equipment.
- G. Provide one copy of an operation and maintenance video for each piece of equipment, if available. Videos become the property of the Owner.
- H. Submit written documentation, signed by the personnel receiving instruction, that training was received with the date it was given. Submit written documentation that keys were transmitted to Owner.

3.7 FINAL CLEANING

- A. General: Provide final cleaning of all equipment both inside and outside. Comply with manufacturers' instructions for cleaning operations. Final cleaning of the food service equipment by the Food Service Equipment Contractor is not scheduled until all contractors other than Food Service Equipment Contractor have completed their work. Food Service Equipment Contractor and General Contractor shall coordinate timing of the final cleaning to allow sufficient time for the Food Service Equipment Contractor to complete his final adjustments; to schedule inspection by the Architect and his Food Service Consultant; and to schedule training of the Food Service employees. The preceding must occur before training is scheduled and Owner occupies the kitchen.
- B. Remove protective coverings and labels which are not required as permanent labels.
- C. Clean glazed materials, including glass shelves and sneeze guards, to a polished condition, removing substances which are noticeable as vision-obscuring materials. Replace any broken glass.
- E. Clean exposed exterior and interior hard-surfaced finishes, including metals, painted surfaces, plastics, special coatings, and similar surfaces, to a dirt-free condition, free of dust, stains, films and similar noticeable distracting substances. Restore reflective surfaces to their original reflective condition.
- F. Replace work which cannot be successfully restored.
- G. Polish exposed metal surfaces and touch-up painted surfaces.
- H. Boil out fryers.
- I. Clean the interior and exterior of all the food service equipment to a condition of sanitation ready and acceptable for intended food service use.
- J. It is the sole responsibility of Food Service Equipment Contractor to protect all food service equipment with coverings, to maintain clean status of equipment between cleaning and occupancy. Protective coverings are removed immediately before Owner occupies the area.
- K. Cleaning is completed by General and Food Service Equipment Contractors before requesting first inspection by Architect and his Food Service Equipment Consultant.

3.8 PREREQUISITES TO SUBSTANTIAL COMPLETION

- A. Complete the requirements included in this Section.
- B. Submit Operation and Maintenance Manuals to Architect for review.
- C. Submit Record Document for Architect/General Contractor.

- D. Deliver physical items such as unattached accessories to Owner.
- E. Transmit keys to Owner. Each key is labeled by description and Item Number.
- F. Complete start-up, adjustment, leveling and calibration of all equipment.
- G. Conduct final test of equipment.
- H. Complete final cleaning requirements.
- I. Complete operating and training requirements.
- J. Request first inspection by Architect.
- K. From receipt of written first inspection report prepared by Architect, Food Service Equipment Contractor has ninety days to complete corrections. Notification of receipt is made to Architect by Food Service Equipment Contractor. At the end of the ninety day period, if final inspection by Architect has not been scheduled by the Food Service Equipment Contractor, AIA procedures for correction of the deficiencies by others at the expense of the Food Service Equipment Contractor may be initiated.

3.9 PREREQUISITES TO FINAL ACCEPTANCE

- A. Submit to Architect copy of Architect's first and/or prior inspection report of itemized work to be completed or corrected, stating that each item has been corrected or otherwise resolved for acceptance. At same time, request a final inspection by Architect.

3.10 RECORD DOCUMENT SUBMITTAL

- A. Record documents shall include the following:
 - 1. Provide one (1) set of as-built shop drawings including floor plan, dimensioned electrical and mechanical rough-in drawings and equipment schedule; as-built shop drawings showing elevations, cross-sections, and details of all custom equipment as provided with the submittals. Give particular attention to concealed work which would be difficult to measure and record at a later date. Note any deviations from the original drawings and specifications. Note related change order numbers where applicable.
- B. Submit directly to Architect and/or General Contractor as required.

3.11 EQUIPMENT SCHEDULE

Substitutions by any bidder wishing to supply alternate equipment other than that specified shall follow the requirements listed in the Invitation to Bid.

Bidders recommending such substitutions are cautioned to examine mechanical and electrical plans and conditions of building to determine if such substitutions will require changes in mechanical or electrical connections which have already been planned. If proposed substitutions require such changes, bidder shall be responsible for any cost involved.

Any bidder wishing to supply alternate equipment other than that specified must submit a written request for substitution to the OWNER ten (10) days prior to the Bid Date for approval or disapproval. The request must be accompanied by the name of the manufacturer and model, a complete description of the proposed substitution, drawings, catalog cuts, specifications, performance and test data, samples, of applicable, and all information

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necessary for an evaluation. A statement describing any changes in materials, equipment, or work that incorporation of the substitute would require must be included. A detailed description of the manner in which the proposed substitution conforms and/or varies from the item specified must also be provided. If approved an addendum will be issued.

ITEM 1 AIR CURTAIN QTY: 1
MANUFACTURER: BERNER
MODEL: SLC07-1060A
ELECTRICAL: REFERENCE PROJECT DRAWINGS FOR ELECTRICAL REQUIREMENTS.

Description:

General Contractor to provide knock-out in door frame for wiring to micro switch in order for control wiring to be run in conduit concealed in wall above door. Food Service Contractor to coordinate with door supplier. See detail

Accessories:

1. Air curtain to be ordered with 505CRD163SJT-03B 3' Cord and plug factory mounted.
2. Automatic door switch, plunger type for automatic on/off control model 9503SD020-P.
3. Supply 66ZPR000DMB-AZ-007-WP Z wall bracket, adjustable depth, white powder coated finish.
4. Supply 66ADS000DMB mounting bracket for plunger switch used with manual swing doors.

APPROVED ALTERNATES IF MATCH DETAILED SPECIFICATIONS: MARS

ITEM 2 DRY STORAGE ROOM SHELVING QTY: 1-LOT
MANUFACTURER: METRO
MODEL: Super Erecta®

Description:

Four tier shelving units with bottom shelf 8" above finished floor and shelving spaced evenly with top shelf even with top of posts.

Shelf, wire, XX"W x 21"D, Metroseal™ Green epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, plastic split sleeves are included in each carton, NSF

Model 74PK3 Quick Ship - Super Erecta® SiteSelect™ Post, 74-1/2"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3 Green epoxy coated corrosion-resistant finish with Microban® antimicrobial protection

APPROVED ALTERNATES IF MATCH THE DETAILED SPECIFICATIONS: AMCO and ULINE

ITEM 3: CAN RACK QTY: 3
MANUFACTURER: NEW AGE
MODEL: 97294

Description:

First In, First Out Can Rack, stationary design, with sloped glides for automatic can retrieval, holds (156) #10 cans, front edge turned up, welded alloy construction, adjustable feet, NSF, Made in USA, (standard factory lead time) Accessories:

Accessories:

1. 0118 adjustable glide feet.

APPROVED ALTERNATES IF MATCH THE DETAILED SPECIFICATIONS: KELMAX and ADVANCE

ITEM 4: HEAVY DUTY TWO TIER SHELVING QTY: 1-LOT
HEAVY DUTY
MANUFACTURER: NEW AGE
MODEL: SEE BELOW

Description:

TWO tier shelving units with bottom shelf 8" above finished floor and shelving spaced evenly with top shelf even with top of posts.

2 EACH PER UNIT 24XXTB Dimensions: XX(w) x 24(d)

"Adjust-A-Shelf" T-Bar Series Shelf, XX"W x 24"D, all welded aluminum construction, 1500 lbs. capacity, NSF, Made in USA, (standard factory lead time)

4 EACH PER UNIT Model 48P Post, 48"H, marked in 2" increments, aluminum finish, NSF, Made in USA,
(standard factory lead time)
4 EACH PER UNIT Model 0116 Adjustable Foot, 1-5/16" dia., upright, (standard factory lead time)
Lifetime guarantee against rust & corrosion. Lifetime guarantee against workmanship and material defects.
APPROVED ALTERNATES IF MATCH THE DETAILED SPECIFICATIONS: WINHOLT AND CHOICE

ITEM 5 FLOOR CLEANING MACHINE

QTY: 2

MANUFACTURER: NILFISK

MODEL: FANG15B

Description:

Viper Fang 15B 15", 3.5 gallon, battery micro scrubber, 15" brush, 20" squeegee assembly, 5-amp
Charger, two AGM 33 a/h batteries. www.nilfisk.com

ITEM 6 CHEMICAL STORAGE ROOM SHELVING

QTY: 1-LOT

MANUFACTURER: METRO

MODEL: Super Erecta®

Description:

Four tier shelving units with bottom shelf 8" above finished floor and shelving spaced evenly with top shelf even
with top of posts.

Shelf, wire, XX"W x 21"D, Metroseal™ Green epoxy-coated corrosion-resistant finish with Microban®
antimicrobial protection, plastic split sleeves are included in each carton, NSF

Model 74PK3 Quick Ship - Super Erecta® SiteSelect™ Post, 74-1/2"H, adjustable leveling bolt, posts are
grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3 Green epoxy
coated corrosion-resistant finish with Microban® antimicrobial protection

APPROVED ALTERNATES IF MATCH THE DETAILED SPECIFICATIONS: AMCO and ULINE

ITEM 7 WASHER

QTY: 1

MANUFACTURER: GE

MODEL: GTW335ASNWW – White OR MOST UP TO DATE SIMILAR MODEL

ELECTRICAL: REFERENCE PROJECT DRAWINGS FOR ELECTRICAL REQUIREMENTS.

Description:

Deep Clean Cycle – Achieve the ultimate deep clean for your toughest laundry loads with 67%
more cleaning power than the most commonly used cycle*. *Colors, Normal cycle

Capacity – Wash large items and do laundry less often with a large 4.2 cubic feet of capacity.

Water Level/Load Size – Take the guesswork out of choosing the right water level with PreciseFill
or manually select any water level for maximum cleaning performance.

Deep Rinse – Ensure clothes are thoroughly rinsed free of detergent, fabric softener and other
additives.

Heavy-Duty Agitator – Thoroughly clean every load thanks to a powerful washing motion.

Stainless Steel Basket – Long-lasting, durable stainless steel resists rust and won't chip, peel or
snag clothes.

Made in America – This appliance is made in America and contains 70 to 90% U.S. content.

11 Wash Cycles – Choose from 11 wash cycles that accommodate every load type.

6 Water Temperatures – Pick the water temperature you prefer and wash your way.

700 RPM Spin Speed – Efficiently remove water and minimize drying time with a fast spin speed.

Bleach and Fabric Softener Dispensers – Improve results with dispensers that automatically
release bleach and fabric softener at the optimal point during the wash cycle.

Cycle Status Lights – Easily track your wash cycle with lights that indicate fill, soak, wash, rinse or
spin status with just a glance.

APPROVED ALTERNATES IF MATCH THE DETAILED SPECIFICATIONS: WHIRLPOOL and SAMSUNG

ITEM 7.1 DRYER

QTY: 1

MANUFACTURER: GE

MODEL: GTD33EASKWW – White OR MOST UP TO DATE MODEL

ELECTRICAL: REFERENCE PROJECT DRAWINGS FOR ELECTRICAL REQUIREMENTS.

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Description:

Aluminized alloy drum – Improves energy efficiency and resists corrosion
3 heat selections – Offer a choice of drying temperatures for personalized fabric care.
Up to 120 ft. venting capability – Provides flexible installation
Auto Dry – For clothes that come out feeling and looking great, this setting monitors air temperature to set the optimal drying time
Rotary electromechanical controls – Make it simple to set cycles
Up-front lint filter – Makes cleaning out lint easy
Reverse-a-door – Door opening can be reversed to meet laundry room needs

APPROVED ALTERNATES IF MATCH THE DETAILED SPECIFICATIONS: WHIRLPOOL and SAMSUNG

ITEM 8 WALL SHELVING

QTY: 2

MANUFACTURER: ATLANTA CUSTOM FABRICATORS (ACF)

MODEL: CUSTOM

Description: Dimensions: 13.5(h) x 60(w) x 15(d)

Shelf, wall-mounted, 60"W x 15"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 16/304 satin finish stainless steel, NSF

Accessories:

- Weld support brackets to wall shelf for 15" deep wall shelves

MUST BE OVER THE LENGTH OF THE WASHER AND DRYER-CONFIRM EXACT LENGTH TO FIT.

MOUNT AT 54" AFF AND 66" AFF.

Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are: Atlanta Custom Fabricators, Commercial Stainless Fabricators, Marietta, GA. Low Temp Manufacturing, Jonesboro, GA.; Titan Stainless, Pageland, SC and Advance Tabco.

ITEM 9 MOP SINK

QTY: 2 NIC (NOT IN

CONTRACT)

BY OTHER TRADES

ITEM 9.1: SERVICE FAUCET

QTY: 3

MANUFACTURER: T & S BRASS

MODEL: B-0655-BSTP

Description:

Service Sink Faucet, 8" centers-adjustable from 7-3/4" to 8-1/4", 5-1/8" clearance wall to center line of faucet, 11-5/8" from wall to center of outlet, polished chrome-plated finish, with built in screwdriver stops

Accessories:

B-0230-K (2 EACH)

Installation Kit, (2) 1/2" NPT nipples, lock nuts & washers, (2) short "Ell" 1/2" NPT female x male

ITEM 10: MOP AND BROOM HANGER

QTY: 4

MANUFACTURER: ADVANCE TABCO

MODEL: K242

Description:

Holds three mops/brooms

Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are: Low Temp Manufacturing, Jonesboro, GA.; Titan Stainless, Pageland, SC and Advance Tabco.

ITEM 11 CARTS

QTY: 8 (5 SHOWN ON PLANS)

MANUFACTURER: RUMBERMAID

3 EACH: MODEL: FG9T6700BLA

Description:

Utility Cart, 40-1/4"L x 25-5/8"W x 27-3/8"H, 500 lb. capacity, (2) shelves, open base, polyethylene exterior, (2) fixed and (2) swivel 4" casters, assembly required, black, Made in USA (THESE ARE

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MCKEE PROJECT NO. 25-160B

FOR USE AT THE SERVING LINES-SHOWN ON PLANS

2 EACH: MODEL: FG342488BLA

Description:

Utility Cart, 33-5/8"L x 18-5/8"W x 37-3/4"H, 200 lb. capacity, (3) shelves, smooth surface, handles, open sides, plastic construction, brushed aluminum uprights, (4) 4" swivel casters, assembly required, black, HACCP

1 EACH: MODEL: FG452500BLA

Description:

Flat Shelf Utility Cart, 43-7/8"L x 25-5/8"W x 33-5/16"H, 500 lb. capacity per shelf, (2) shelves, open base, polyethylene exterior, (4) 5" thermoplastic rubber (TPR) casters, assembly required, black, Made in USA

1 EACH: MODEL: FG440300BLA

Description:

Platform Truck, heavy duty, 36 x 24", 1000 lb. capacity, slide locking latches, molded-in tie-downs slots, textured deck surface, deck channels, retainer clips on handle, powder coated steel handle/frame, (2) fixed and (2) swivel 5" TPR casters, Duramold™ resin and metal composite construction, black, Made in USA

1 EACH: MODEL: FG443600BLA

Description:

Platform Truck, heavy duty, 48" x 24", 2000 lbs. capacity, slide locking latches, molded-in tie-downs slots, textured deck surface, deck channels, retainer clips on handle, powder coated steel handle/frame, (2) fixed and (2) swivel 8" TPR casters, Duramold™ resin and metal composite construction, black, Made in USA

APPROVED ALTERNATES IF MATCH DETAILED SPECIFICATIONS: CARLISLE and CAMBRO

ITEM 12 WALK IN COOLER/FREEZER

QTY: 1-LOT

MANUFACTURER: THERMOKOOL

MODEL: CUSTOM

ELECTRICAL: REFERENCE PROJECT DRAWINGS FOR ELECTRICAL REQUIREMENTS.

Description and Accessories:

Refrigerant:

Cooler: Meet CFC reduction regulations

Freezer: Meet CFC reduction regulations

Size: Nominal 8'-6" high

Verify overall box dimensions with drawings, reference Architectural drawings for wall dimensions.

Door swings and positions must be as shown on the drawing.

All specifications apply to cooler and freezer unless indicated otherwise.

The THERMO-KOOL prefabricated modular construction. It shall be designed and constructed to allow fast and easy field assembly, disassembly, relocation and enlargement by the addition of like modular panels. Walk-in shall be designed and constructed as shown on plan. Overall size of walk-in shall be CUSTOM to fit exact job site requirements. 8'-6" height outside dimensions for walk in is standard unless otherwise noted in the detailed specification per school. See all drawings for special instructions.

PANEL CONSTRUCTION:

Wall and ceiling panel widths shall be within 1" increments up to 46" wide. Corner panels shall be 90 degree angle, 12" x 12". All panels shall be interchangeable with like panels for fast and easy assembly. Partition panel placement shall be within 1" increments to meet shelving space requirements.

All panels shall consist of metal pans formed to precise dimensions. Metal finish to be as specified. Insulation shall be "foamed-in-place" urethane to bond permanently to complete inner surfaces of both interior and exterior metal pans to form strong rigid unit. Panels shall not have internal wood or metal support, framing, straps, or other non-insulating members. Each panel shall be 100% urethane foam insulation exclusive of metal pans.

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MCKEE PROJECT NO. 25-160B

Perimeter structure shall be formed of DURATHANE, high density urethane insulation forming tongues and grooves to assure vapor and airtight joints and to prevent pre-installation damage and deterioration of exposed urethane surfaces.

Construction shall be as approved by the National Sanitation Foundation. Unit shall bear the NSF® Seal of Approval affixed to the interior of a door panel.

Floor is recessed. Coordinate recess depth so that the walk-in box flooring is no more than a ¼" above finished floor of the kitchen. Floor of walk-in cooler/freezer is not covered with kitchen finish floor system.

Common Wall Partition:

When specified or shown on drawing, walk-in shall be divided into compartments by use of insulated panels. Panels shall be constructed in accordance with specifications for all panels. Partitions in standard locations shall be foam tongue and groove construction secured in place by com-lock fasteners. All partition panels shall have foamed-in-place thermal breakers to prevent condensation and heat transfer between compartments of different temperatures.

WARRANTY:

MANUFACTURER MUST PROVIDE ONE YEAR PARTS AND LABOR FOR ALL COMPONENTS OF WALK IN COOLER AND FREEZER.

Panels shall be covered by a Ten-Year Factory Warranty.

Compressor shall have a one year parts and labor warranty with an additional four years for parts for compressor.

INSULATION:

Insulation shall be 4" or 5" thick rigid, zero ozone depleting HFC 134a blown Class I urethane foam classified according to UL 723 (ASTM-E-84) as tested by Underwriters Laboratories, Inc. The core material has a flame spread of 25 or less and a smoke density of 250.

The urethane foam is foamed-in-place to bond to inner surfaces of metal pans having an average thermal conductivity (K factor) of 0.13 BTU/hr./sq. ft. per degrees /Fahrenheit/inch. As tested in accordance with ASTM C 518-2004, the R factor for coolers at temperatures of 55 F° is greater than 29.0 for 4" thick and greater than 36.0 for 5" thick panels; for freezers at temperatures of 20 F° the R factor is greater than 32.0 for 4" thick and greater than 40.0 for 5" thick panels.

(R-value of R-25 for Coolers and R-32 for Freezers required to meet 2009 Energy Code)

The prefabricated urethane foamed panels shall be supplied with a Class I fire hazard classification according to UL 723 (ASTM-E-84) as tested by Underwriters Laboratories, Inc. Panels shall have a flame spread rating of 25 or less and bear a certifying Underwriters Laboratories, Inc. label.

This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions

METAL FINISHES:

INTERIOR WALLS are .040 stucco Aluminum.

INTERIOR CEILING is .040 stucco Aluminum with white baked-on enamel finish.

INTERIOR FLOOR is 1/8" Aluminum Diamond Tread Plate.

EXPOSED EXTERIOR WALLS including door section .040 stucco Aluminum.

PANEL LOCKING ASSEMBLIES:

Assembly of walk-in shall be accomplished by "Insta-Loks" consisting of cam-action hook arm assembly set in one panel and a self-aligning, self-centering, pin assembly set in the matching panel. All vertical joints must have a minimum of three Insta-loks. Rotation of the cam-action hook arm shall pull and lock panels together to form airtight, vapor proof joints. No metal straps or connecting rods shall be used inside the panels. Rotation of the

cam-locks shall be operated from inside the walk-in through access ports that are sealed with vinyl snap-in closures.

PANEL GASKETS:

NSF listed double-bead vinyl gasket shall be applied to the tongue side of all panels, on both interior and exterior. Gaskets shall be impervious to stains, grease, oils, mildew, sunlight, etc.

ENTRANCE DOOR AND FRAME:

Walk-in compartment shall be equipped with total of TWO (2) each 34" x 76" hinged-type, flush-mounted entrance door mounted in a nominal 4', 5' or 6' frame and located in exact location as shown on drawing. Door placement shall be within 1" increments to meet shelving space and job site requirements. Door shall be manufactured to accommodate floor construction. Door and frame shall be listed by Underwriters Laboratories and bear the UL Seal of Approval and be equipped with the following:

Door shall be equipped with a one-piece perimeter PVC accordion type removable gasket with magnetic core at the top and along the side perimeter of the door. An adjustable wiper gasket shall be mounted along the bottom edge of the door.

Latch shall be break-a-way type with cylinder lock and inside safety release handle so the door can be opened from the inside even if locked. A positive action hydraulic door closer (required to meet 2009 Energy Code) shall be included to ensure gentle closing action of door to opening and to ensure positive closing of door. The latch shall be of high pressure zinc die cast with highly polished chrome finish.

TWO hinges shall be nine inch modified strap, cam-lift, self-closing design with door lift off capability of high-pressure zinc die cast with highly polished chrome finish. (a spring loaded hinge required to meet 2009 Energy Code) KASON model 1346 adjustable hinges are required.

Door frame shall consist of heavy reinforced steel "U" channel frame to encompass entire perimeter of opening, foamed-in-place to give extra support and rigidity to frame and to prevent racking, distortion, warping and twisting. A backup must be welded for added strength.

An armored anti-sweat heater cable shall be run in a breaker strip located behind a removable heavy gauge stainless steel trim for easy access to heater cable. Heater cable shall be run under threshold consisting of heavy reinforcement "U" channel breaker strip and heavy gauge stainless steel threshold.
(A second back up heater cable is to be installed).

The warmer cables shall provide sufficient heat to prevent condensate or frost formation. Door heater has a thermostat that cuts off when it reaches a temperature of 50°F.

Door shall be equipped with contemporary design, heavy-duty, pull handle. Pull handle shall have a cylinder lock built into the handle. Latch shall be provided with inside safety release to prevent accidental or malicious entrapment in walk-in. Latch has brushed satin chrome finish. Two (2) keys are provided for lock

Door section shall be provided with an operating toggle switch and pilot light mounted on the exterior side of the door frame. (Weathertight switches also available for outdoor walk-in applications.) An incandescent vapor proof light and face mounted inlet box shall be mounted on the interior side of the door frame for 115 volt, 60 cycle, 1 phase A.C. service (Energy Efficient and Motion Sensor Lighting available for Energy Savings). All wiring shall be in concealed rigid conduit. A 2-1/2" diameter chrome face, flush mount, dual reading, adjustable dial thermometer shall be provided on exterior of door section to provide temperature reading of -40 degrees C to +150 degrees C.

AIR DOORS:

Supply air doors (MARS or Berner) with plunger type control in both door panels with adequate backing as required.

POWER BOX SUPPLY

Power supply box for all lights, heated vent, air curtain electrical receptacle, air curtain micro-switch, heated window (frame and glass), door heater and sill heater is pre-wired and mounted on top near door section by manufacturer. Electrical Contractor supplies and installs power wiring to power supply box. Wiring for lights; door and sill heaters; heated viewport; heated vent (freezer); air curtain receptacle; and air curtain micro-switch must be identified. Design power supply box such that power can be terminated for service while allowing other accessories to continue to function. Each of the electrical components (heated view port, heated vent, door and sill heaters, lights, air curtain receptacle, air curtain micro-switch) is wired to a 4" x 4" junction box which is foamed in place in the center of the jamb. A short piece of PVC electrical conduit is installed out of the junction box to the top of the foam rail of the jamb for the walk-in. The conduit shall have a coupling on it in order to be mated up with the conduit coming through the ceiling panel out of the wiring box located on the top of the ceiling. After the walk-in is set-up, the wires are fed from the junction box through the conduit into the power supply box for final termination per the wiring schedule. Walk-in manufacturer pre-wires for incoming power source for air curtain inside front panel with recessed receptacle (115/60/1) foamed in place and located on front of box near top of air curtain. Incoming power connection for air curtain to be located in power supply box on top of each compartment.

TREADBRITE KICKPLATES:

Door shall have aluminum diamond treadbrite kickplates 48" high on the interior and exterior. Diamond tread kickplates shall be mounted with adhesive and sealed with silicone. No external fasteners such as screws or pop rivets shall be applied as fastening for the diamond tread kickplates.

LED LIGHT FIXTURES:

LED light fixtures shall be provided in quantity as required. (Energy efficient lighting required to meet 2009 Energy Code.) Must have switch with pilot light.

Contractor must furnish CORRECT LED BULBS as required Freezer.

Food Service Equipment Contractor shall install fixtures for Electrical Contractor to wire to junction box provided by manufacturer. LED light fixtures are mounted to ceiling panels where shown on the drawings and are connected to a three-way light switch with dual pilot light. Pilot light glows continuously inside and is on outside of box only when lights are on. Light switch is mounted on exterior and interior door section. Electrical service required is 120 volt, 60 cycle, 1-phase. Electrical Contractor provides and installs conduit and wiring on inside ceiling of boxes. See Installation Instructions this section for additional requirements.

HEATED PRESSURE RELIEF VENT:

Walk Ins shall be equipped with a two-way heated pressure relief vent to equalize pressure between the interior and exterior caused by defrost cycles and opening of door. Electrical service to be 115v/60/1 phase.

FLOOR CONSTRUCTION:

THERMO-KOOL DURA-FLOOR: For additional stationary floor load strength of up to 12,000 lbs. per square foot THERMO-KOOL's DURA-FLOOR shall be provided which shall consist of an interior surface of foamed-in-place 1/8"

Aluminum Treadplate with high density urethane support structures foamed-in place on interior of floor panel and firmly attached to a foamed-in-place plywood subfloor.

TRIM AND ENCLOSURES:

Supply 1/8" treadplate wainscot on all exposed exteriors to match doors.

Cove base is required around all exposed sides.

Supply minimum of five (5)" high cove base on exposed walls of same material walk in exterior panels are made. Cove base shall be mounted with adhesive and sealed with BUTYL RUBBER SEALANT, 368, on top and bottom to control moisture from seeping under the walk ins. No external fasteners such as screws or pop rivets shall be applied as fastening for the cove base.

NOTE: Mount cove base then wainscot over the base so that it is the same height at the treadplate on doors.

Supply and install trim made from material with same finish as exposed exterior where walk-in cooler/freezer is adjacent to walls; seal to walls and boxes for rodent, dirt and moisture protection. Attach trim to box and wall with non-corrosive fasteners and seal to wall and box with clear silicon caulking. Extend trim to height of dropped ceiling, or enclosure panel.

Enclosure Panel:

Supply and install enclosure (made from material with same finish as exposed exterior) panel or ceiling trim if height of box is lower than height of dropped ceiling. Enclosure panel to extend below seam between ceiling and wall panels of the walk-in. Attach panel to box with non-corrosive fasteners and seal to ceiling and box with clear silicon caulking. See Part 3, Installation Instructions, for type of clear silicon caulking to use.

Supply stainless steel hat channels to cover exposed control and refrigeration lines along building.

THRESHOLD:

A heavy gauge stainless steel threshold plate shall be provided with each door section.

THRESHOLD TO NOT EXCEED 15% ANGLE ON INTERIOR OR EXTERIOR

ALARM:

Walk-in shall be equipped with audio-visual alarm(s) that activate when temperature rises above desired setting. Alarm sensor is to be located in the return air stream of evaporator coil. Control panel shall be located at front of walk-in or at other pre-specified location. When temperature rises above predetermined setting a red light and buzzer activates. (Model (1) Thermo-Kool TK4700 walk-in monitor system with TK4 panic switch, motion detector, battery backups, dry contacts and thermostatically controlled heater wires).

REFRIGERATION:

Condensing units shall be factory assembled and UL approved. The condenser shall be air-cooled. Refrigerant for medium and low temperature systems shall be R448A

LLT42 (2 Systems) One temperature sensor is standard per unit. Additional sensors ordered as a separate line item. n Setup for 115V input control power (customizable to other control power) n NEMA 4 enclosure with viewing window n Box temperature adjustable from -30° F to 70° F n Ambient temperature: 15° F to 140° F n Relative humidity: < 90% and non-condensing n Alarm contacts: 240V 8A n Battery life: 10 year (program/data protection)

1 EA 2 HP, Remote Pre Assembled Refrig. System Model RFON200E4AEANT 208-230/60/3 Medium Temperature, base, weather hood, winter controls, Scroll, Air-cooled, R454A (9.6 Compressor RLA) w/ leak detection with 2 RAL6A081ADARSF 115/60/1 coil (0.8 amps) with Dual Speed EC motor and EcoNet 2.0 with Sporlan SER. Accessories: 2 ea A2L SSOV and CSOV Mitigation Valves (Shipped Loose For Field Install). 1 ea Suction line components: Sealed Filter.

2 EA 5 HP, Remote Pre Assembled Refrig. System Model RFON500L4AEA 208-230/60/3 Low Temperature, base, weather hood, winter controls, Scroll, Air-cooled, R454A, Std. Defrost Kit (17 Compressor RLA) w/ leak detection with RAL6E173DDARSF 208-230/60/1 coil (1.5 fan amps, 14.3 heater amps) with Dual Speed EC motor and EcoNet 2.0 with Sporlan SER. Accessories: 2 ea A2L SSOV and CSOV Mitigation Valves (Shipped Loose For Field Install). 2 ea Suction line components: Sealed Filter.

3EA Compressor warranties

Evaporators shall be forced air type with air flow parallel to the walk-in ceiling. Evaporators shall be a standard low profile series. (Electronically Comutated Motors required to meet 2009 Energy Code). All evaporator coil components shall be housed in heavy gauge aluminum housing. Units shall have drain pan with drain pipe connection.

Condensing unit voltage to be as specified by job site requirements.

Units shall have drain pan with drain pipe connection. Evaporators shall be equipped with an automatic electric defrost system including coil heaters, time clock, fan delay control, drain line heaters and liquid line solenoid.

The basic components shall be supplied for Remote Preassembled and shall include condensing unit, evaporator coil, control kit (pressure control, thermostat, liquid line drier, sight glass, suction line vibration eliminator, expansion valve and evaporator coil mounting kit), defrost timer, fan delay control and liquid line solenoid suction accumulator, and quick response controller (QRC). All parts shall be factory mounted. Provide factory mounted suction accumulators-field installed will not be accepted.

Remote Preassembled the system requires tubing, electrical hook-up, drain line and refrigerant charge supplied by qualified refrigeration, electrical and plumbing contractors.

A low ambient kit and weatherproof housing shall be supplied with condensing units. The low ambient kit shall consist of a crankcase heater and headmaster valve.

NOTE: Supply single point electrical connection for all accessories with labeled wiring through door panels to top of wall in, in foamed in place conduit.

Copeland compressor/condensing units and Bohn or Russell evaporator coils are required. All work and materials are in full accordance with Local and/or State ordinances.

INSTALLATION INSTRUCTIONS:

Electrical Contractor will supply and run conduit and power wiring to cooler condensing unit and conduit and power wiring to freezer evaporator coil.

Electrical Contractor will supply and run conduit and control wiring from all coils to refrigeration control system. .

Electrical Contractor to supply conduit and wiring and make connections to and supply boxes provided and installed by the manufacturer for all lights, heated windows, door and sill heaters. Lights are not mounted by the factory. Food Service Equipment Contractor or approved installer to mount additional lights located on ceiling after walk-in box has been erected. Conduit and wiring for lights are supplied and installed by Electrical Contractor on the inside ceiling of the box. Electrical Contractor to provide conduit suitable for moist conditions. Conduit seal-offs are required for all electrical connections. All fasteners, etc., must be non-corrosive and mastic provided between dissimilar metals to prevent rusting.

Food Service Equipment Contractor to supply and install refrigeration lines. Food Service Equipment Contractor is responsible for determining length of lines needed.

Condensation drain lines are supplied and installed by Food Service Equipment Contractor

or approved installer.

Condensate heat tape shall be 208/1 and supplied by Food Service Equipment Contractor and wired into freezer evaporator by Electrical Contractor.

Installation will be performed by the Food Service Equipment Contractor or an approved professional refrigeration company with experience in the installation of walk-in Cooler/Freezer refrigeration systems.

The installation includes, but is not limited to the following:

Building the box.

Setting the compressor/condensing unit assemblies.

Hanging the evaporator coils - verify locations.

Installation of all accessories unless indicated otherwise.

Installation of all refrigeration lines which includes supplying, running and connecting.

Installation of the drain lines - Verify locations; supply and install tubing.

Food Service Equipment Contractor seals and insulates all penetrations in the walk-in, regardless of who makes the penetration. Conduit seal-offs are required for all electrical connections and are supplied by the Electrical Contractor. Insulation and sealing is required between conduit and wiring and inside conduit where any type of connection or penetration is made. Food Service Equipment Contractor is responsible for informing and coordinating the use of conduit seal-offs by other contractors and for providing proper insulation and sealing for all other penetrations when conduit seal-offs cannot be used. Perform start-up, test, check, and adjust all components and accessories and pull to proper operating temperatures. Walk-in Cooler/Freezer refrigeration systems to run for five consecutive days prior to equipment demonstrations.

Calibrate thermometers, etc.

Box is to be cleaned before refrigeration is started up. Cleaning includes all inside and outside surfaces.

Hard copper is required for entire job. All refrigerant piping is ACR copper tubing, hard drawn. Wrought copper sweat fittings are used on the hard-drawn tubing. Slope suction line down in direction of flow 1/8" per foot. Where vertical risers of more than 5 feet occur in a suction line, the riser is trapped at the bottom.

Refrigeration system is set for four defrost cycles as a minimum (two defrost cycles for cooler) with each cycle in defrost 30 minutes as a minimum. Defrost times are set at times other than the initial arrival of the employees or periods of heavy usage during the morning and are identified in the Operation and Maintenance Manuals. Training on re-setting defrost times is provided to Owner during training.

System is ready for use when the Owner is prepared to occupy the operation.

General Contractor Information:

Steel reinforced concrete pad for walk-in box is prepared and supplied by General Contractor. See Food Service Equipment Contractor's supplied drawings and shop drawings for dimensions. Pad area must be transit level and trowel smooth and capable of sustaining weight of box and contents.

RECESSED TO BE DETERMINED BY TILE AND GROUT THICKNESS IN KITCHEN PLEASE CONFIRM WITH GENERAL CONTRACTOR.

Roof curbs (if required) are to be Food Service Equipment Contractor provided and install by the General Contractor.

All penetrations, including but not limited to, roof, wall and floor are provided by the General Contractor. Verification by the General Contractor with the Food Service Equipment Contractor as to location and size is required.

Sprinkler heads inside or over units must be loaded with a dry fire suppression substance.

Plumbing lines (supply, waste, drain, roof drain, sewer, condensation, slurry, etc.) cannot be routed over walk-in boxes.

WARRANTIES:

One-year parts, service, labor, mileage, time and transportation warranty on all parts supplied and all work performed.

Five-year non-prorated replacement warranty for the compressor/ condensing unit assemblies.

Five-year service and parts warranty.

APPROVED ALTERNATES IF MATCH DETAILED SPECIFICATIONS: ARTIC AIR, BALLY AND KOLPAK

ITEM 13 SPARE NUMBER

ITEM 14 COOLER SHELVING STATIONARY

QTY: 1-LOT

MANUFACTURER: METRO

MODEL: Super Erecta®

Description:

Four tier shelving bottom shelf is 8" AFF and other three shelves are evenly spaced. See drawing for sizes and location of shelving. "S" hooks are approved where shown on drawing.

Four tier shelving units with bottom shelf 8" above finished floor and shelving spaced evenly with top shelf even with top of posts.

Shelf, wire, XX"W x 21"D AND 18"D-SEE DRAWINGS, Metroseal™ Green epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, plastic split sleeves are included in each carton, NSF Model 74PK3 Quick Ship - Super Erecta® SiteSelect™ Post, 74-1/2"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3 Green epoxy coated corrosion-resistant finish with Microban® antimicrobial protection

APPROVED ALTERNATES IF MATCH THE DETAILED SPECIFICATIONS: AMCO and ULINE

ITEM 15: COOLER SHELVING MOBILE

QTY: 1-LOT

MANUFACTURER: METRO

MODEL: Super Erecta®

Description:

THREE tier shelving bottom shelf is 8" AFF and other three shelves are evenly spaced. See drawing for sizes

Four tier shelving units with bottom shelf 8" above finished floor and shelving spaced evenly with top shelf even with top of posts.

Shelf, wire, XX"W x 21"D AND 18"D-SEE DRAWINGS, Metroseal™ Green epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, plastic split sleeves are included in each carton, NSF Model 54PK3 Quick Ship - Super Erecta® SiteSelect™ Post, 54-1/2"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3 Green epoxy coated corrosion-resistant finish with Microban® antimicrobial protection

PROVIDE CASTERS FOR WALK IN CONDITIONS WITH BRAKES ON ALL NOTED MOBILE SHELVING-SEE DRAWINGS

APPROVED ALTERNATES IF MATCH THE DETAILED SPECIFICATIONS: AMCO and ULINE

*****SPECIAL NOTE: LOCATION OF MOBILE SHELVING IS TO ALLOW SERVICE TO THE COILS-IF COIL LOCATION ON SITE IS DIFFERENT THAN WHAT IS SHOWN ON FS DRAWINGS PLEASE REVISE LAYOUT TO ACCOMADATE THESE CHANGES IN THE FIELD*****

ITEM 16 FREEZER SHELVING STATIONARY

QTY: 1-LOT

MANUFACTURER: METRO

MODEL: Super Erecta®

Description:

Four tier shelving bottom shelf is 8" AFF and other three shelves are evenly spaced. See drawing for sizes and location of shelving. "S" hooks are approved where shown on drawing.

Four tier shelving units with bottom shelf 8" above finished floor and shelving spaced evenly with top shelf even with top of posts.

Shelf, wire, XX"W x 21"D AND 18"D-SEE DRAWINGS, Metroseal™ Green epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, plastic split sleeves are included in each carton, NSF Model 74PK3 Quick Ship - Super Erecta® SiteSelect™ Post, 74-1/2"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3 Green epoxy coated corrosion-resistant finish with Microban® antimicrobial protection
APPROVED ALTERNATES IF MATCH THE DETAILED SPECIFICATIONS: AMCO and ULINE

ITEM 17: FREEZER SHELVING MOBILE

QTY: 1-LOT

MANUFACTURER: METRO

MODEL: Super Erecta®

Description:

THREE tier shelving bottom shelf is 8" AFF and other three shelves are evenly spaced. See drawing for sizes and location of shelving. "S" hooks are approved where shown on drawing.

Four tier shelving units with bottom shelf 8" above finished floor and shelving spaced evenly with top shelf even with top of posts.

Shelf, wire, XX"W x 21"D AND 18"D-SEE DRAWINGS, Metroseal™ Green epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, plastic split sleeves are included in each carton, NSF Model 54PK3 Quick Ship - Super Erecta® SiteSelect™ Post, 54-1/2"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3 Green epoxy coated corrosion-resistant finish with Microban® antimicrobial protection

PROVIDE CASTERS FOR WALK IN CONDITIONS WITH BRAKES ON ALL NOTED MOBILE SHELVING-SEE DRAWINGS

APPROVED ALTERNATES IF MATCH THE DETAILED SPECIFICATIONS: AMCO and ULINE

SPECIAL NOTE: LOCATION OF MOBILE SHELVING IS TO ALLOW SERVICE TO THE COILS-IF COIL LOCATION ON SITE IS DIFFERENT THAN WHAT IS SHOWN ON FS DRAWINGS PLEASE REVISE LAYOUT TO ACCOMMODATE THESE CHANGES IN THE FIELD

ITEM 18 72" X 30" WORKTABLE

QTY: 1

MANUFACTURER: ACF

MODEL: CUSTOM

Description:

Work Tables, 72"W x 30"D x 41"H, 14/300 stainless steel top, backsplash, legs, undershelf & adjustable bullet feet, NSF

Accessories:

- 1 EA: Drawer, 20"W x 20"D x 5"H, roller bearing slides & stainless steel drop in pan, stainless steel construction, NSF SEE FS100 FOR LOCATIONS & AMOUNT.
- Casters, 5"H, (2) with brake (set of 4)
- SD: Sound Deadening.
- Dimensions: 20(h) x 72(w) x 12(d)

Shelf, cantilevered, 36"W x 12"D, 2" turn up at rear and both sides, 16/300 stainless steel construction, NSF Model MOD 2" with bull nose edging on front: SEE FS100 FOR LOCATION.

Fabricators which are pre-approved for construction of stainless-steel custom fabrication (serving line equipment excluded) are: Atlanta Custom Fabricators, Commercial Stainless Fabricators, Marietta, GA. Low Temp Manufacturing, Jonesboro, GA.; Titan Stainless, Pageland, SC and Advance Tabco

ITEM 19 SPARE NUMBER

ITEM 20 SPARE NUMBER

ITEM 21 PREP TABLE WITH SINKS

QTY 1

MANUFACTURER: ACF

MODEL: CUSTOM

Description:

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Work Table 120"W x 30"D x 41"H, 14/300 stainless steel top, backsplash, legs, undershelf & adjustable bullet feet, NSF WITH PROVISION FOR ITEM # 22 DISPOSER AND CONTROL PANEL. (VEGETABLE PREP SINK)

See drawing FS-500 for location of sinks, drawer, shelf and undershelves.

Accessories:

1. MARINE EDGE
2. 2 ea Sink Bowl, fabricated, 1 ea 20"W x 20" front-to-back x 14" deep bowl and 1 ea 20"W x 20" front-to-back x 7.25" deep bowl, 16/201 stainless steel construction
3. Model Lever Drain, twist handle, includes handle bracket, 2" drain (Provided and installed by ACF)
4. Sink Cover, fits 20" x 20" sink bowl, 1/2" poly construction
5. Holder for sink cover on right side of table
6. Drawer, 20"W x 20"D x 5"H, roller bearing slides & stainless steel drop in pan, stainless steel construction, NSF
7. Shelf, cantilevered, 48"W x 12"D, 2" rear up turn, 16/300 stainless steel construction, NSF
8. Higher Backsplash-to be 8"
9. Bullet Foot, stainless steel
10. Sound Deadening
11. SS panel for installation of disposer control panel.

Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are: Atlanta Custom Fabricators, Commercial Stainless Fabricators, Marietta, GA. Low Temp Manufacturing, Jonesboro, GA.; Titan Stainless, Pageland, SC and Advance Tabco

ITEM 21.1 PRE-RINSE FAUCET WITH ADD A FAUCET

QTY 1-LOT

MANUFACTURER: T & S BRASS

MODEL: B-0133-ADF10-B

Description:

Easy Install Pre-Rinse Unit, with wall bracket, wall mount base, 8" centers, 44" flexible hose with overhead spring body & B-0107 spray valve, 18" riser, add-on faucet with 10" swing nozzle, lever handles, 1/2" NPT female inlets, quarter-turn Eterna cartridges, low leaf

Accessories:

1. T&S Brass Model B-0230-K Installation Kit, (2) 1/2" NPT nipples, lock nuts & washers, (2) short "El" 1/2" NPT female x male

ITEM 22 DISPOSAL SYSTEM

QTY:1

MANUFACTURER: HOBART

MODEL: FD4/300+BUILUP

Disposer, basic unit only, 3 HP motor, steel housings, adjustable flange feet

- 1 ea Standard warranty - 1-Year parts, labor & travel time during normal working hours
- 1 ea Model FD4/300-ELE0KT 208-230/460v/60/3-ph & 208/415v/50/3-ph
- 1 ea Model CONTROL-GRP60KP Control Panel Group 6, 200-240v/50/3-ph & 200-240/440-480v/60/3-ph
- 1 ea Model ACCESS-GROUPB Disposer Accessory, GROUP B, includes: vinyl silver-saver splash guard ring, vacuum breaker, water swirl
- 1 ea Model ADAPTER-7INCH 7" I.D. stainless steel adapter for welding to sink or trough

APPROVED ALTERNATES INSINKERATOR AND SALVAJOR

ITEM 23 PREP TABLE WITH SINK

QTY 1

MANUFACTURER: ACF

MODEL: CUSTOM

Description:

96"W x 30"D x 41"H, 14/300 stainless steel top, backsplash, legs, undershelf & adjustable bullet feet, NSF

See drawing FS-500 for location of sinks, drawer, shelf and undershelves.

Accessories:

1. MARINE EDGE

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- Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are: Atlanta Custom Fabricators, Commercial Stainless Fabricators, Marietta, GA. Low Temp Manufacturing, Jonesboro, GA.; Titan Stainless, Pageland, SC and Advance Tabco

QTY 1

Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are: Atlanta Custom Fabricators, Commercial Stainless Fabricators, Marietta, GA. Low Temp Manufacturing, Jonesboro, GA.; Titan Stainless, Pageland, SC and Advance Tabco

QTY 2

2. T&S Brass Model B-0230-K Installation Kit, (2) 1/2" NPT nipples, lock nuts & washers, (2) short "Ell" 1/2" NPT female x male

Hand Sink, wall mounted, 14" wide x 10" front-to-back x 5" deep bowl, Deep Drawn™ sink bowl, 20 gauge 304 stainless steel, welded 7-3/4"H side splashes, heavy duty splash mounted gooseneck faucet, knee valve, basket drain, keyhole wall mount bracket, NSF, cCSAus

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Accessories:

1. 8 ea Model 7-PS-10 P-trap, heavy duty, 1-1/2", 17 gauge
BK RESOURCES IS APPROVED ALTERNATE

ITEM 26 WASTE CONTAINERS
MANUFACTURER: RUBBERMAID
MODEL: FG353600GRAY

QTY: 7 (5 SHOWN)

Description:

BRUTE® Container, square, without lid, 40 gallon, 23-1/2"D x 28-3/4"H, nesting handles, rounded corners & smooth contours, plastic construction, gray, NSF, Made in USA

Accessories:

- 7 ea Model FG353900GRAY BRUTE® Container Lid, square, 24"D x 2"H, for 3536 container, tight-fitting, gray, NSF, Made in USA
- 7 ea Model FG353000BLA BRUTE® Dolly, square, 17-1/4"D x 6-1/4"H, for 3526 and 3536 containers, 250 lb. capacity, black, NSF, Made in USA

VERIFY AT LEAST TWO TRASH CANS MUST FIT UNDER SOILED DISHTABLE
APPROVED ALTERNATES IF MATCH DETAILED SPECIFICATIONS: CARLISLE AND CAMBRO

ITEM 27 SPARE NUMBER

ITEM 28 84" X 30" WORKTABLE
MANUFACTURER: ACF
MODEL: CUSTOM
Description:

QTY: 1

Work Table, 84"W x 30"D x 41"H, 14/300 stainless steel top, 8" backsplash, SS legs, SS undershelf & adjustable bullet feet, NSF

Accessories:

- 1 EA: Drawer, 20"W x 20"D x 5"H, roller bearing slides & stainless steel drop in pan, stainless steel construction, NSF SEE FS100 FOR LOCATIONS & AMOUNT.
- Sound Deadening.

Fabricators which are pre-approved for construction of stainless-steel custom fabrication (serving line equipment excluded) are: Atlanta Custom Fabricators, Commercial Stainless Fabricators, Marietta, GA. Low Temp Manufacturing, Jonesboro, GA.; Titan Stainless, Pageland, SC and Advance Tabco

ITEM 29 HOT WATER DISPENSER
MANUFACTURER: HATCO
MODEL: AWD-12

QTY: 1

ELECTRICAL: Reference Project drawings for electrical requirements.

Description:

Atmospheric Hot Water Dispenser, countertop design, 12-gallon capacity, automatic fill, pushbutton portion control, low water cut-off, electronic temp. control with digital display, red & white granite powder coated body, stainless steel tank, shelf & base

Accessories:

1. Model AWD-PLUMB 3 ft. rubber drain hose with 10 ft. 1/4" inlet tubing
2. Model AWD-FILTER Water filtration system with 10' of 1/4" tubing & fittings

APPROVED ALTERNATES BLOOMFIELD AND BUNN

ITEM 30 MIXER
MANUFACTURER: HOBART
MODEL: HL200-1STD

QTY: 1

ELECTRICAL: Reference Project drawings for electrical requirements.

Description:

TRANSMISSION: Gear-driven. Gears are constant mesh heat-treated hardened alloy steel along with anti-friction ball bearings. Grease lubricants furnished to all gears and shafts.
Three Fixed Speeds plus Stir Speed

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Shift-on-the-Fly™ Controls
 Soft start Agitation Technology
 Magnetic contactor with thermal overload protection. Internally sealed "Start-Stop" push buttons. A 15-minute SmartTimer™ is standard. SmartTimer™ includes Automatic Time Recall, which remembers the last time set for each speed.
 Ergonomic Swing-Out Bowl
 Stainless Steel Bowl Guard
 Hobart Quick Release™ agitators allow for simple installation and removal from agitator shaft
 BOWL GUARD: Heavy-duty stainless steel wire front and solid rear portion. Front portion of guard rotates easily to add ingredients and install or remove agitator. It detaches in seconds for cleaning in dishwasher or sink. Rear portion of guard can be quickly cleaned in position. Guard must be in closed position before mixer will operate. Bowl support interlock provides further protection.
 BOWL LIFT: Ergonomic style, hand crank operated, self-locking in top and bottom position.
 FINISH: Metallic Gray Hybrid Powder Coat finish.
 ATTACHMENT HUB: Comes with front-mounted Hobart standard #12 taper attachment hub for use with Hobart #12 size attachments.

Accessories:

1. Stainless steel bowl
2. Aluminum "B" beater
3. Stainless steel "D" wire whip
4. Aluminum "ED" spiral dough arm
5. TABLEHW-HL2012 Mixer Table; 27"W x 32"D x 26"H, the top shelf is drilled for mounting an HL120 or HL200 mixer, includes 4 posts for storing attachments, a lower shelf for additional storage, & (4) locking 5" diameter wheels

ITEM 31-33 SPARE NUMBER

ITEM 34 PAN RACKS

QTY: 6

MANUFACTURER: NEW AGE

3 EACH MODEL 1655:

Description:

Mobile pan rack with 13 adjustable aluminum guides, bottom pans slides are welded in place. 4 ½" OC for 12 x 20 to 18 x 26 pans, 1 ½" centers, end loading, 5" platform swivel casters, NSF, MADE IN USA.

Lifetime warranty against rust and corrosion, 5 year workmanship and material defects warranty.

Accessories:

1. PS Pan Stop, aluminum strap welded to rear of unit (MUST BE FACTORY INSTALLED)

3 EACH MODEL 7331:

Description:

Bun pan rack, full height, open sides, with angle glides on 3" centers, capacity 20-18" x 26" sheet pans, all welded construction, end loading, 5" platform, NSF, MADE IN USA.

Lifetime warranty against rust and corrosion, 5 year workmanship and material defects warranty.

Accessories:

1. PS Pan Stop, aluminum strap welded to rear of unit (MUST BE FACTORY INSTALLED)
2. Provide SIX (6) vinyl rack covers for size rack specified. Provide covers as manufactured by Berner Corp. or Coverall, Division of Worcester Slitting and Manufacturing.
Provide full height window on panel that rises.

APPROVED ALTERNATES IF MATCH THE DETAILED SPECIFICATIONS: CHANNEL and CHOICE

ITEM 35 MOBILE WORKTABLES

QTY: 3

MANUFACTURER: ACF

MODEL: CUSTOM SEE BELOW

Description:

35A 1 EA DOUBLE SIDED-Work Table, 84"W x 30"D x 41"H, WITH CENTER MOUNTED 7' X 15' SINGLE SHELF 16/300 stainless steel construction, NSF

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MCKEE PROJECT NO. 25-160B

35B & 35C 2 EA DOUBLE SIDED-Worktable 60" X 30" X 41" WITH NO OVERSHELVES

ALL TABLES

14/300 stainless steel top, undershelf NSF

Accessories: (Per Table)

1. Drawer, 20"W x 20"D x 5"H, roller bearing slides & stainless steel drop in pan, stainless steel construction, NSF (2 per table): SEE FS100 FOR LOCATIONS & AMOUNT.
2. Bullnose edges
3. Casters, 5"H, (2) with brake (set of 4)
4. Sound Deadening.

SEE FS100 FOR LOCATION

Fabricators which are pre-approved for construction of stainless-steel custom fabrication (serving line equipment excluded) are: Atlanta Custom Fabricators, Commercial Stainless Fabricators, Marietta, GA. Low Temp Manufacturing, Jonesboro, GA.; Titan Stainless, Pageland, SC and Advance Tabco

ITEM 36-39 SPARE NUMBERS

ITEM 40 FULL SIZE MOBILE HEATED CABINET

QTY: 1

MANUFACTURER: F.W.E.

MODEL: C599-SDS-UA

Dimensions: 74.75(h) x 30(w) x 36.38(d)

Description:

C5™ 9 Series Controlled Humidity Heated Holding and Proofing Cabinet with 6.8" touch-screen controls, mobile, full height, insulated solid dutch doors, universal wire slides, capacity (17) 18" x 26" or (34) 12" x 20" x 2-1/2" pans, 3" O.C. (adjustable on 1-1/2" increments), stainless steel, 5" casters, polymer bumper & drip trough combination, 120v/60/1-ph, 2000 watts, 16.7 amps, NEMA 5-20P, cULus, NSF, Made in USA, ENERGY STAR®

1 ea 1 year warranty against manufacturing defects

1 ea Right hand hinging, standard

1 ea Model C5-STRPLG-20 Straight plug, 20 AMP, for C51, C53, C56, C58 & 59 series cabinet

APPROVED ALTERNATES IF MATCH DETAILED SPECIFICATIONS: WINSTON AND F.W.E.

ITEM 41 EXHAUST HOOD

QTY: 1-LOT

NOT IN CONTRACT BY OTHER TRADES

ITEM 41.1 UTILITY DISTRIBUTION SYSTEM (UDS)

QTY: 1

MANUFACTURER: CAPTIVEAIRE

MODEL: CUSTOM

ELECTRICAL: Reference Project drawings for electrical requirements.

Description:

A Utility Distribution System shall provided be as indicated on drawings. Systems shall have two vertical risers, one on each end, with one dedicated to electrical and the other to plumbing. The horizontal distribution raceway between the risers shall be separated into electrical and plumbing compartments and each shall be completely enclosed and water tight with removable access panels. The risers and raceway shall be constructed of 16 gauge, type 304 stainless steel, #4 finish. A circuit protected dual convenience outlet shall be provided on each riser. Service connections shall be located behind easily removable access panels.

Approvals: Unit(s) shall be ETL Listed to US and Canadian Standards, ETL Sanitation Listed, AGA and MA approved.

General Construction and Features

- Electrical Riser: Main power connection shall be made to the main circuit breaker which has a shunt trip and is mounted in the electrical riser.^[SEP]
- Wireway systems: Electrical power shall be fed through a main circuit breaker to a distribution panel which contains individual branch breakers. Each appliance is fed from the individual breakers which are wired to each receptacle located along the raceway.^[SEP]
- Plumbing Riser: The plumbing riser shall house manual (quarter-turn) shut-off valves for each incoming main supply line located in the UDS. The plumbing manifolds shall be provided with stub-outs along the

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raceway for the individual plumbing connections. Each stub-out shall be equipped with a manual (quarter-turn) shut-off valve. [L] [SEP]

- Expandability: All electrical systems are designed for additional capacity for future expansion or upgrade of connected appliances. [L] [SEP]
- Wireway: Electrical distribution panel located in the riser shall be equipped with branch circuit breakers and sized for expansion. [L] [SEP]
- Serviceability and Accessibility: Lift out doors shall provide easy access to risers without moving cooking equipment, in most cases. Removable panels provided along the length of the raceway shall allow access to either plumbing or electrical compartments. [L] [SEP]
- Electric Outlets and Cord Sets: All outlets shall provide moisture resistant covers and have been sized per NEMA standards. Each is supplied with a matching cord and plug set if these are not already supplied by the equipment manufacturer. Twist-lock sets are standard in island applications. All 120V, single phase 15 and 20 amp receptacles are DCO-GFI. [L] [SEP]
- Main Disconnect: One point disconnect through a main circuit breaker equipped with a 120 VAC rated shunt trip provided in the riser. [L] [SEP]
- Gas Solenoid Valve: Electrical or Mechanical. Electrical valves shall be provided with a manual reset button and time delay relay to prevent pilot lights from going out in momentary power outages.
- Shunt Trip: Shall be provided with each main breaker. [L] [SEP]
- Appliance Protection: Each electrical outlet connection shall be protected with an individual circuit breaker.

Electrical

- Wireway Systems: The electrical system shall consist of a main circuit breaker which feeds power to a distribution panel located in the electrical riser containing individual branch breakers. Each appliance is fed from the individual breakers which are wired to each receptacle located along the raceway and shall be completely isolated from the plumbing supply manifolds. The main circuit breaker shall be equipped with a built-in 120 VAC rated shunt trip and shall be located in the electrical riser requiring a single point incoming connection. Terminal block connections shall be provided for field interconnection between the shunt trip and the fire protection system for power shut-off in the event of a fire. All outlets shall be equipped with grounding type receptacles having specific NEMA polarized configurations and located on the under side (Model UDI) or front side (Model UDW) of the raceway at each equipment location. Outlets are matched to the cord and plug sets supplied with equipment. On the Model UDI, all 120V, single phase 15 and 20 AMP receptacles are DCO-GFI. Twist lock cord and plug sets are provided for equipment supplied without cords. On the Model UDW, straight blade cord and plug sets are provided for equipment supplied without cords. [L] [SEP]
- Main Circuit Breaker: 120/208/3 50 AMP

Plumbing

- The plumbing compartment shall be completely isolated from the electrical with all piping labeled. [L] [SEP]
- Hot and cold water and steam supply and return manifolds shall be insulated. [L] [SEP]
- All incoming service connections shall be provided with 1/4 shut-off valve. Each branch connection shall be provided with 1/4 shut-off valve, with color coded hoses, and located at each equipment location. [L] [SEP]
- Color coded quick disconnect hoses are provided for connection to equipment. [L] [SEP]
- Hot and cold water piping, including branch connections, shall be type "L" copper tubing. All fittings will be copper sweat soldered (95-5 type). [L] [SEP]
- Gas and steam piping, including branch connections, shall be threaded black iron. There shall be a drip tee on the incoming gas end. The gas manifold shall be furnished with either an electrical or mechanical gas valve which shall be field interlocked with the fire protection system to shut off fuel sources in the event of a fire. Electrical gas valves shall be furnished with a manual gas reset button and time delay relay to prevent pilot lights from going out in momentary power outages, located in the UDS riser. [L] [SEP]
- Gas manifolds are sized for an inlet pressure of 7" WC for natural gas or 11" WC for LP.

Gas Equipment

All gas equipment shall conform to local-Code requirements

- Manifold (looped): 3/4" to 3" IPS. [L] [SEP]
- 1/4 turn manual shut-off valve on manifold. [L] [SEP]
- Quick disconnect hoses: 1/4" to 1-1/4", up to 6' long. [L] [SEP]
- Quick disconnect fittings: 1/4" to 1-1/4" with 1/4 shut-off valves

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Hot and Cold Water-

- Manifold: 3/4"
- 1/4 turn manual shut-off valve on manifold
- Quick disconnect hoses: 1/4" to 1", up to 6' long
- Quick disconnect fittings: 1/4" to 1" with 1/4 shut-off valves

Options

- Remote Status Indicator Panel: Lighted panel indicates status of receptacles in wireway system.
- Electric Outlets & Cord Sets: Water tight pin and sleeve outlets and cords.
- Light & Fan Switches located in riser.
- Hood Control Panel built into riser.
- Swivel Connectors for gas equipment.
- Plumbing Fixtures: Pre-plumbed and installed faucets, mixing valves, hose reels, water filtration systems. YES THERE WILL BE ONE REQUIRED TO BE INCLUDED IN THE UDS. SEE ITEM 50 COMBINATION OVENS WITH WATER FILTER
- Cable Restraints: Available for mobile equipment.
- Temperature/Pressure Gauges for hot/cold water main.

Factory Tested

Unit(s) shall be operated, tested and set at the factory using job-site conditions for electrical and gas input. All operating and safety controls shall be tested and set at the factory.

Service and Parts

The supplier shall furnish gas piping schematics, as built wiring connection and control-circuit diagrams, dimension sheets and a full description of the unit(s). Service manuals showing service and maintenance requirements, shall be provided with each unit.

ITEM 42 SPARE NUMBER

ITEM 43 40 GALLON TILTING SKILLET, GAS

QTY: 1

MANUFACTURE: CLEVELAND

MODEL: SGL40T1

Dimensions: 39(h) x 49.88(w) x 41(d)

Description

PowerPan™ Tilting Skillet, gas, 40-gallon capacity, bead blasted cooking surface, 10° tilt cooking feature, with easy manual hand tilt, spring-assisted cover with vent, gallon & liter markings, stainless steel construction with open leg frame, 200,000 BTU, CE, NSF

- 1 ea 1-year parts & labor warranty, standard
- 1 ea Extended Warranty, not to exceed 36 months from date of installation (K-12 Schools only)
- 1 ea 10 Year Pan warranty (K-12 Schools only)
- 1 ea Performance start-up included at customer request after equipment is installed (Free Water Quality Check included) (contact Cleveland Sales Representative for details)
- 1 ea Natural Gas
- 1 ea 120v/60/1-ph, 1.4 amps, NEMA 5-15P, standard
- 1 ea Standard controls, temperature control dial, LED ON indicator light, main power switch with standard and high power setting, standard
- 1 ea Model PT2 Power Tilt, with hand tilt override
- 1 ea Model TD2SK 2" tangent draw-off valve, front mounted left side
- 1 ea Model PCS Pan Carrier, for floor models
- 1 ea Model PRSS H/C Pre-Rinse Spray Head with hose (P/N B-0113)
- 1 ea Model FBST1 Faucet Bracket for T1 series floor model skillets
- 1 ea Model FSSK Food Strainer, 30 & 40 gallon, for braising pans

**SPECIAL NOTE: FSC MUST SUPPLY INLINE VACCUM BREAKER AS CODE REQUIRES

Model FL FOOTKIT 4 Flanged Feet, for all BPM & BPP models (set of 4)

APPROVED ALERNATES IF MATCH THE DETAILED SPECIFICATIONS: VULCAN AND GROEN

ITEM 44-45 SPARE NUMBER

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ITEM 46 DOUBLE STACK CONVECTION OVENS, GAS
MANUFACTURE: BLODGETT
MODEL: DFG-100 DBL

QTY: 3 STACKS

Description:

Dimensions: 70.63(h) x 38.25(w) x 36.88(d)
Convection Oven, gas, double-deck, standard depth, capacity (5) 18" x 26" pans per compartment, (SSD) solid state digital controls, 2-speed fans, interior light, simultaneous operated doors with glass, stainless steel front, sides & top, 6" stainless steel legs, flue connector, (2) 1/2 HP, 55,000 BTU each, cETL, NSF, CE
3 year parts, 2 year labor and 2 additional year door warranty (parts only), standard
1 year additional labor only warranty (per section) (MUST be purchased at time of original equipment order)
Start-Up option to all the convection and deck ovens (Does not included assembly or installation of any components)
Natural gas
115v/60/1-ph, 6.0 amps, 1/2 hp, 2-wire with ground, NEMA 5-15P (per deck), standard
Model SSD Top Oven: Solid State digital with Pulse Plus® and Cook & Hold, standard
Model SSD Bottom Oven: Solid State digital with Pulse Plus® and Cook & Hold, standard
Draft diverter
6" legs, adjustable, stainless steel (set), standard

ITEM 47 COMBINATION OVENS

QTY: 1 STACK

MANUFACTURER: VULCAN

MODEL: ABC7G-NAT

Dimensions: 35(h) x 42.2(w) x 42.4(d)

Description:

Combi Oven/Steamer, natural gas, boilerless, (7) 18" x 26" full size sheet or (14) 12" x 20" full size hotel pan capacity, (3) knobs with LED displays for temperature, timer & humidity, auto-adjustment of humidity with temperature selection, auto-reversing fan with electronic braking system, cool to touch glass door, flashing door light & audible alert, (4) Grab n Go wire racks, stainless steel interior & exterior, 80,000 BTU, 120v/60/1-ph, engineered & assembled in USA, UL EPH Classified, cULus

- 1 ea NOTE: Item qualifies for a no charge equipment check out after the unit has been fully installed & put into service. contact your Vulcan Representative for more details
- 1 ea 1 year limited parts & labor warranty, standard
- 1 ea K-12 School Nutrition extended warranty extends the warranty for 12 months beyond the 12 month Original Equipment Warranty, not to exceed 24 months from date of installation
- 1 ea Filtration System
- 1 ea Model CB30K-SYSTEM Single Hollow Carbon Filter System, with 30,000 gallon capacity, for chlorine & chloramine reduction, sediment, bad tastes & odors, total organic compounds, tannins & trihalomethanes, ANSI/NSF 42 & 53
- 1 ea Opted out of Reverse Osmosis System
- 1 ea Model STACK-ABC/G Stacking Kit, gas, for (2) ABC7G Combi, includes: vent kit, spray hose, drip tray & casters
- 1 ea Model V-SPRAY V-SPRAY Standard Spray Hose Kit, provided with ABC Stand or Stacking Kits, includes: sprayer, hose, fittings, and mounting bracket

ITEM 48 FLOOR TROUGH

QTY: 1

MANUFACTURER: IMC/TEDD7

MODEL: ASFT-1836-SG

Description:

Dimensions: 12.25(h) x 36(w) x 18(d)
ASFT Anti-Spill Floor Trough, 36"W x 18"D, 6" deep receptacle, (1) 4" OD tailpiece, stainless steel beehive strainer, 14/304 stainless steel, brushed satin finish, (SG) subway grating, NSF, Made in USA
Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are: Low Temp Manufacturing, Jonesboro, GA.; Titan Stainless, Pageland, SC and Advance Tabco.

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ITEM 48.1 FLOOR TROUGH
MANUFACTURER: IMC/TEDD7
MODEL: ASFT-1236-SG

QTY: 1

Description:

Dimensions: 12.25(h) x 36(w) x 12(d)

ASFT Anti-Spill Floor Trough, 36"W x 12"D, 6" deep receptacle, (1) 4" OD tailpiece, stainless steel beehive strainer, 14/304 stainless steel, brushed satin finish, (SG) subway grating, NSF, Made in USA

Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are: Low Temp Manufacturing, Jonesboro, GA.; Titan Stainless, Pageland, SC and Advance Tabco.

ITEM 49 CONVECTION STEAMER, GAS
MANUFACTURE: CLEVELAND
MODEL: Model 24CGA10.2ES

QTY: 2

Dimensions: 68.94(h) x 24(w) x 33.13(d)

Description:

Steamcraft® Gemini™ 10 Convection Steamer, pressureless, gas, 2 compartments with individual generators, (5) 12 x 20 x 2-1/2 pans/compartment capacity, SureCook controls, easyTimer 90-minute timer with dial and LED digital readout in minutes and seconds, includes SureCook load compensating thermostat, manual cooking mode and descale indicator, left-hand hinged door, controls on right, 1 standard treated & tap water connection, stainless steel construction, 6" adjustable legs with flanged feet, 100,000 BTU total, ENERGY STAR®

- 1 ea 1-year parts & labor warranty, standard
- 1 ea Extended warranty, not to exceed 24 months from date of installation (for K-12 schools only)
- 1 ea 5 year pro-rated parts warranty on boilers & steam generators
- 2 ea 3 year Convection Steamer Door Warranty, standard
- 1 ea Performance start-up included at customer request after equipment is installed (Free Water Quality Check included) (contact Cleveland Sales Representative for details)
- 1 ea Model FLT0040 Optipure Water Treatment System, dual-cartridge, reduces sediments over 0.5 microns, reduces chlorine, includes (1) CTOS-Q10 Catalytic Carbon Filter & (1) CTOS-QCR activated carbon filter
- 1 ea Second year limited warranty on water related parts only when purchasing a steamer and filter from Cleveland. Must include a completed Performance Start-Up (See Cleveland warranty statement for details)
- 1 ea Model FLT0014 Optipure CTO-Q10 Water Treatment Cartridge, activated carbon filter, for QT11-CR
- 1 ea Model WBT-CTOS-QCR Optipure CTOS-QCR Water Treatment Cartridge, catalytic carbon filter, for CT11-CR
- 1 ea Natural Gas
- 1 ea (VOS115) 120v/60/1-ph, 2 blowers & controls, 150 watts each (DO NOT connect to GFI outlet)
- 1 cs Model DISSOLVE Descaling Solution, (6) one-gallon containers with quart markings (P/N 106174)
- 1 ea Model BDPK1 Boiler Descaling Pump Kit, for SteamCraft atmospheric generators (P/N 1071421)

ITEM 50 TABLE AT PASS THRU WINDOW
MANUFACTURER: ACF
MODEL: CUSTOM

QTY: 2

Description:

Dimensions: 41(h) x 66(w) x 24(d) MODIFIED TO FIT THE SPACE

Cabinet Base Table , approximately 66"W x 30"D, 14/300 stainless steel top, middle shelf, stainless steel legs & adjustable bullet feet, 16/304 stainless steel body, NSF

Accessories:

1. Bull Nose Edge-FRONT AND BACK
2. Hinged doors with locks BOTH SIDES of cabinet
3. Sound deadening

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4. Kickplate on Serving Room side only

Supply telescoping pass thru frame, before roll down door is installed. Provide and install 22 gauge, Type 304, 18-8 stainless steel picture frame with 3" overlay on all sides on customer and operator sides to seal any gaps between units and wall cap. Corners must be welded and ground smooth. Trim is sealed to boxes with clear silicon caulking. Use clear silicon caulking described in this section under Installation. Purpose of trim and caulking is to provide a complete seal between the wall cap and boxes and to close crevices against dirt and vermin. Reference page FS-500 for detail SEE FS-501)

ITEM 51 SINGLE DOOR PASS THRU HEATED CABINET

QTY: 6

MANUFACTURER: TRAUlsen

MODEL: RHF132WP-FHG Dimensions: 83.25(h) x 29.88(w) x 39(d)

Spec-Line Heated Cabinet, Pass-thru, one-section, stainless steel exterior and interior, standard depth cabinet, full-height glass doors, with EZ-Clean Gaskets, (3) clear coated adjustable shelves per section, microprocessor controls, 6" adjustable stainless steel legs, cETLus, ETL-Sanitation

6 ea 6-year parts & labor, standard. Visit www.traulsen.com for details

6 ea 208/115v/60/1-ph, 7.7 amps, standard

6 ea Thermometer side door: hinging to be determined

Door hinging to be determined-SEE DRAWINGS

Accessories:

1. PER CABINET: 10 UNIVERSAL TRAYSLIDES PER SECTION

2. GLASS DOORS ON KITCHEN SIDE ONLY

APPROVED ALTERNATES IF MATCH DETAILED SPECIFICATIONS: VICTORY

ITEM 52 SINGLE DOOR PASS THRU REFRIGERATED CABINET

QTY: 3

MANUFACTURER: TRAUlsen

MODEL: RHT132WPUT-FHG

Dimensions: 83.25(h) x 29.88(w) x 37.94(d)

Description:

Spec-Line Refrigerator, Pass-thru Display, one-section, self-contained refrigeration, StayClear™ Condenser, variable speed compressor, stainless steel exterior and interior, standard depth, wide full-height glass door on both sides with EZ-Clean Gaskets, interior lights, (3) adjustable wire shelves per section, microprocessor controls, 6" adjustable stainless steel legs, R-290 Hydrocarbon refrigerant, 1/2 hP, cETLus, ETL-Sanitation, ENERGY STAR®

3 ea 6-year parts & labor and 7 year compressor, standard. Visit www.traulsen.com for details

3 ea 115v/60/1-ph, 8.3 amps, cord with NEMA 5-15P, standard

Door hinging to be determined-SEE DRAWINGS

Accessories:

1. PER CABINET: 10 UNIVERSAL TRAYSLIDES PER SECTION

2. GLASS DOORS KITCHEN SIDE ONLY

APPROVED ALTERNATES IF MATCH DETAILED SPECIFICATIONS: VICTORY

ITEM 53-55 SPARE NUMBERS

ITEM 56,57 and 58

QTY 3-LOTS

MANUFACTURER: ATLANTA CUSTOM FABRICATORS

MODEL: CUSTOM

ELECTRICAL: Reference Project drawings for electrical requirements.

Special Instructions:

• Supply the following smallwares per instructions below:

12 ea Carlisle 2618FGQ004 Black Market Trays per Cold Food Counter (**Total of 36**)

2 ea Volrath 19186 Sheet Pan Adapters per Cold Food Counter (**Total of 6**)

2 ea Volrath 19186 Sheet Pan Adapters per Hot Food Counter (**Total of 6**)

SERVING LINES ARE TO BE DELIVERED UNCRATED AND SET IN PLACE AND ALL COMPONENTS

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INCLUDING INTERNAL WIRING TO BE COMPLETED AND INSTALLED BY KITCHEN EQUIPMENT CONTRACTOR (KEC). KEC RESPONSIBLE FOR ALL CLEANING AND REMOVAL OF DEBRIS FROM SITE. SPECIAL NOTE FOR ALL COUNTER SPECIFICATION THAT IS NOT INCLUDED BELOW BUT SHALL BE PROVIDED: STAINLESS STEEL STAND OFFS WITH ACRYLIC DECORATIVE/CUSTOM PANELS AND BACK LIGHTING

Specification for stone counter tops:

Material Thickness: Product Type 063 - 1.18 inch (3 cm), nominal

Material Weight: 15 lbs./ft2 for 3 cm thick surfacing.

Color and Pattern: Selected by Food Service Director

FABRICATION

A. Fabricate components in shop, to greatest extent practicable, in sizes and shapes indicated according to approved shop drawings and Wilsonart Quartz Fabrication Manual.

B. Form joint seams between quartz surfacing components with specified seam adhesive. Completed joints inconspicuous in appearance and without voids. Provide joint reinforced if required by manufacturer for installation conditions.

C. Provide holes and cutouts for plumbing fixtures and accessories indicated on approved shop drawings. Rout cutouts and finish edges smooth.

ACCESSORY MATERIALS

A. Joint Adhesive: Methacrylate-based adhesive for chemically bonding quartz surfacing seams. Color complementary to quartz surfacing sheet material. UL 2818

GREENGUARD Gold certified and complies with SCAQMD Rule 1168.

1. Basis of Design: "Wilsonart Hard Surface Adhesive."

2. Other Acceptable Products: Pigmented knife grade adhesives suitable for use with quartz surfacing are also acceptable.

B. Elastomeric Sealant: Mildew-resistant silicone sealant for filling gaps between countertops and terminating substrates in wet environment applications. Complies with ASTM C 920, Type S (single component), Grade NS (nonsag).

1. Product: Acceptable to countertop manufacturer.

2. Color: [Complementary to quartz surfacing color] [Clear] [Selected from sealant manufacturer's standard offerings].

C. Siliconized Acrylic Sealant: Siliconized acrylic latex sealant. For general applications to fill gaps between countertops and at terminating substrates. Complies with ASTM C 834, Type OP, Grade NF, and SCAQMD Rule 1168.

1. Product: "Wilsonart Color Matched Caulk".

2. Color: [Complementary to quartz surfacing color] [Clear] [Selected from sealant manufacturer's standard offerings].

QUALITY ASSURANCE

A. Qualifications:

1. Manufacturing Facility Qualifications: Quartz surfacing materials produced in an ISO 9001 certified facility.

2. Fabricator Qualifications: Minimum of five years documented experience in fabricating quartz surfacing countertops similar in scope and complexity to this Project, using water-cooled cutting tools. Currently certified by the manufacturer as an acceptable fabricator.

3. Installer Qualifications: Minimum of five years documented installation experience for projects similar in scope and complexity to this Project, and currently certified by the manufacturer as an acceptable installer.

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ITEM 56A, 57A, 58A & 56B, 57B, 58B CUSTOM COUNTER
MANUFACTURER: ATLANTA CUSTOM FABRICATORS
MODEL: CUSTOM
ELECTRICAL: Reference Project drawings for UTILITY requirements.

QTY 3-LOTS

Description:

HOT/COLD FOOD COMBINATION COUNTER (EACH)

Provide and install where shown, THREE (3) only Hot Food Counters with the following features:

Length as shown on drawing x 34" HIGH (ADA)

Counter-Top to be fabricated from WilsonArt Quartz, Material Thickness: Product Type 063 - 1.18 inch (3 cm), nominal

Material Weight: 15 lbs./ft² for 3 cm thick surfacing.

Color and Pattern: Selected by Erin Miller, Child Nutrition Director

Fabricate components in shop, to greatest extent practicable, in sizes and shapes indicated according to approved shop drawings and Wilsonart Quartz Fabrication Manual.

Form joint seams between quartz surfacing components with specified seam adhesive.

Completed joints inconspicuous in appearance and without voids. Provide joint reinforced if required by manufacturer for installation conditions.

Provide holes and cutouts for plumbing fixtures and accessories indicated on approved shop drawings. Rout cutouts and finish edges smooth.

AND EXTENDED 10" IN LIEU OF TRAY SLIDES, Counter Base to be fabricated using 18 Gauge Stainless Steel Galvanized Metals will not be accepted

Counter Bodies will be built standard unitized construction

Top to be braced with Stainless Steel Hat Channel 14 or 16 Gauge Fully Welded Corners Ground Smooth and Polished

All Stainless Steel Construction-430 or Impo.ted Stainless Steel will not be accepted
Unit to be NSF & UL labeled and approved

Raised Acrylic panels. LED Lighting to highlight routed graphic. (color/design to be approved by Erin Miller)

4-Pan Hot Food Drop In-To be rated NSF-7-manufactured by Altoshaam, dry heat, hot wells should be individual wells and wells should be individually switched.

3-Pan Hot Food Drop In-To be rated NSF-7-manufactured by Altoshaam, dry heat, hot wells should be individual wells and wells should be individually switched.

SEE FS600 FOR DETAILS-NOTE EXTRA SPACE BETWEEN HOT WELLS.

1st- Sneeze-guard Length of all Hot Food Wells AND COVERING FLAT SPACE BETWEEN HOT WELLS TO SLIDE TRAYS TO STUDENTS, Deluxe Single Service Protector Shield, Vertical Style-Fabricated from 1" O.D. 16 Gauge Tubing, 3/8" Tempered Glass, Glass Enclosure 1/4" Tempered Glass at Ends, All parts to be brushed stainless steel, sneeze-guard MUST BE ADJUSTABLE WITH LED LIGHTS.

6 Well Refrigerated Cold Pan Drop-In to be rated NSF-7 and fabricated-Digital or Dial Controls
Accepted-Manufacturer Altoshaam

- (1) 2nd- Sneezeguard Length of Cold Food Well Drop-In, Deluxe Fully Adjustable Single Service Protector Guard- LED Display Lights-Fabricated from 1" O.D. 16 Gauge Tubing, 3/8" Tempered Glass, Adjustable Glass Enclosure 1/4" Tempered Glass at Ends, all parts (moving & fixed to be brushed stainless steel only)

Please submit a full set of shop drawings matching all specifications at time of bid if alternate fabricator not listed is being submitted

Fabrication company must have 10 years' experience in Fabricating Custom Serving Lines, must be a NSF & UL approved shop & all equipment to have NSF & UL labels

ITEM 56C, 57C & 58C CASHIER STAND

QTY: 3

MANUFACTURER: ATLANTA CUSTOM FABRICATORS

MODEL: CUSTOM

ELECTRICAL: Reference Project drawings for electrical requirements.

CASHIER COUNTER (1)

Provide and install where shown, THREE Cashier Counters with the following features: 32" long x 32" Wide - see drawing for location

Counter-Top to be fabricated from WilsonArt Quartz, Material Thickness: Product Type 063 - 1.18 inch (3 cm), nominal

Material Weight: 15 lbs./ft² for 3 cm thick surfacing.

Color and Pattern: Selected by Erin Miller, Child Nutrition Director

Fabricate components in shop, to greatest extent practicable, in sizes and shapes indicated according to approved shop drawings and Wilsonart Quartz Fabrication Manual.

Form joint seams between quartz surfacing components with specified seam adhesive.

Completed joints inconspicuous in appearance and without voids. Provide joint reinforced if required by manufacturer for installation conditions.

Provide holes and cutouts for plumbing fixtures and accessories indicated on approved shop drawings. Rout cutouts and finish edges smooth.

AND EXTENDED 10" IN LIEU OF TRAY SLIDES, Counter Base to be fabricated using 18 Gauge Stainless Steel Galvanized Metals will not be accepted

Counter Bodies will be built standard unitized construction

Top to be braced with Stainless Steel Hat Channel 14 or 16 Gauge Fully Welded Corners Ground Smooth and Polished

All Stainless Steel Construction-430 or Imported Stainless Steel will not be accepted Unit to be N F & UL labeled

LED Lighting below tray slide

Raised Acrylic panels routed from rear side with hand painted school mascot and wording. LED Lighting to highlight routed graphic. On both sides.

Sound Deadening Mastic Applied Between Metals

Hole in Top with Grommet for Cords and Cables

Undershelf

Cash Drawer with Lock

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MCKEE PROJECT NO. 25-160B

Duplex receptacle below counter
 NEMA Cord and Plug with 6' cord Sound
 deadening mastic between metals 5" Swivel
 Casters with Locks
 Counter height to be 36"
 Approved Manufacturers: Atlanta Custom Fabricators
 Please submit a full set of shop drawings matching all specifications at time of bid if alternate fabricator
 not listed is being submitted
 Fabrication company must have 10 years' experience in Fabricating Custom Serving Lines, must be
 a NSF & UL approved shop & all equipment to have NSF & UL labels

ITEM 56D, 57D & 58D CONDIMENT STANDS QTY 1
 MANUFACTURER: ATLANTA CUSTOM FABRICATORS
 MODEL: CUSTOM
 ELECTRICAL: Reference Project drawings for electrical requirements.
UTENSIL/CONDIMENT COUNTER (1)

Provide and install where shown, one (1) only Condiment Counter with the following features: 62"

Long x 32" Wide - see drawing for location
 Counter height to be 36"
 Counter-Top to be fabricated from WilsonArt Quartz, Material Thickness: Product Type 063 - 1.18
 inch (3 cm), nominal
 Material Weight: 15 lbs./ft2 for 3 cm thick surfacing.
 Color and Pattern: Selected by Erin Miller, Child Nutrition Director
 Fabricate components in shop, to greatest extent practicable, in sizes and shapes
 indicated according to approved shop drawings and Wilsonart Quartz Fabrication
 Manual.
 Form joint seams between quartz surfacing components with specified seam adhesive.
 Completed joints inconspicuous in appearance and without voids. Provide joint
 reinforced if required by manufacturer for installation conditions.
 Provide holes and cutouts for plumbing fixtures and accessories indicated on approved
 shop drawings. Rout cutouts and finish edges smooth.
 AND EXTENDED 10" IN LIEU OF TRAY SLIDES Counter Base to be fabricated using 18 Gauge
 Stainless Steel-No Galvanized Accepted Counter Bodies will be built standard unitized
 construction.
 Counter top to be turned down on all sides
 Fully Welded Corners Ground Smooth and Polished
 All Stainless Steel Construction-430 or Imported Stainless steel will not be accepted Unit
to be NSF & UL labeled
 Tray slide- Flat Type 10" wide, Counter Length, on all sides to be mounted at 35" height full length
 of counter
 Raised Acrylic panels, color to coordinate with Cashier Counters Sound
 Deadening Mastic Applied Between Metals
 3 Cutouts in Top for Full Size Hotel Pans to Drop-In and Contain Condiments or Utensils Small
 space at end

1 Set of Hinged Doors at Front of Counter Bottom

Shelf in Cabinet Base

5" Swivel Casters with Locks Unit must

be NSF Labeled

SUPPLY 3 EACH VOLRATH MODEL: 97240 CUTLERY DISPENSER-HOLD FOUR CYLINDERS,
INCLUDE 4 EACH STAINLESS STEEL CYLINDERS PER DISPENSER

Approved Manufacturers: Atlanta Custom Fabricators

All Food Guards to be fabricated by Atlanta Custom Fabricators, Brass Smith or VersaGuard

LED Lighting below tray slide

(I) Cord & Plug 5-15P plug with 6' Cord for each Hot Food & Cold Food Units (all electrical to be
verified by the KEC awarded the bid prior to fabrication)

Sound deadening mastic between metals

Access Panel, full length removable by use of tools located at front or rear of counter 5"

Swivel Casters with Locks

Bottom Shelf where possible Counter

height to be 34"

(I) Bolted joint acceptable on the combination counter if needed to allow unit to fit through door

Approved Manufacturers: Atlanta Custom Fabricators.

Please submit a full set of shop drawings matching all specifications at time of bid if alternate fabricator
not listed is being submitted

Fabrication company must have 10 years' experience in Fabricating Custom Serving Lines, must be
a NSF & UL approved shop & all equipment to have NSF & UL labels

ITEM 59 MILK BOXES

QTY: 3

MANUFACTURER: TRUE

MODEL: TMC-58-S-DS-SS-HC

Dimensions: 41.63(h) x 58(w) x 33(d)

Description:

Mobile Milk Cooler, forced-air, (16) 13" x 13" x 11-1/8" crate capacity, dual sided stainless steel drop front/hold-
open flip-up lids with locks, 33 - 38°F temperature range, (3) heavy-duty floor racks, digital thermometer, stainless
exterior, stainless steel interior & floor, 4" castors, R290 Hydrocarbon refrigerant, 1/5 HP, 115v/60/1-ph, 2.7 amps,
NEMA 5-15P, cULus, UL EPH Classified, Made in USA, ENERGY STAR®

3 ea 7 year compressor warranty, 7 years parts warranty, 7 year labor warranty, standard. Visit
www.truemfg.com for specifics.

3 ea Self-contained refrigeration standard

3 ea 4" Castors, standard

APPROVED ALTERNATE IF MATCH DETAILED SPECIFICATIONS: TRAUlsen

ITEM 60 DISPLAY CASE, REFRIGERATED, SELF-SERVE

QTY: 3

MANUFACTURER: Structural Concepts

MODEL: MD685R

Dimensions: 85.5(h) x 74.25(w) x 37.12(d)

Description

Fusion® Self-Service Refrigerated Display Case, 74-1/4"W x 37-1/8"D x 85-1/2"H, open reach-in front, LED top &
shelf lights, self-contained refrigeration, stainless steel rear exterior, powder coated silver/san black, ETL-
Sanitation

3 ea Warranty: 1 year parts & labor warranty, standard

3 ea Exterior Color: Laminate standard color 909-58 Black

3 ea Model GRAIN DIRECTION Standard laminate grain directions (when applicable):

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- Front Panels (Upper Header and Lower Panels): Horizontal grain direction
- End Panels: Vertical grain direction
- Blend & Reveal Cases Only: Horizontal grain direction on front and end panels

3 ea Interior Color: Powder coated SCC Standard Silversan Black (FDA compliant)

3 ea Lower Front Panel Color: Powder coated SCC Standard Silversan Black (FDA compliant), standard

3 ea Base Support: Casters (self-cont.), standard

3 ea Bumper Front: 1" Boston bumper (specify color), standard

3 ea Bumper Front: 1" Boston bumper - Black, standard

3 ea Bumper Left End: None, standard

3 ea Bumper Right End: None, standard

3 ea End Panel Left: Full end panel, standard

3 ea End Panel Right: Full end panel, standard

3 ea Flat header (*Standard flat configuration)

3 ea Price Tag Molding: None, standard

3 ea Rear doors: Rear Doors: Solid rear swinging door(s) with lock

3 ea Shelving: (5) Lighted solid shelves, standard

3 ea Lights: LED 3500K with frost lens, standard

3 ea Electrical Connection: 6' NEMA 6-30P, 208-240v/60/1-ph straight blade power cord, standard

3 ea Refrigeration: Breeze self-contained refrigeration, standard

3 ea Thermometer: Digital fahrenheit thermometer, standard

3 ea Vinyl Graphics: None, standard

3 ea Night curtain, retractable, non-locking

ITEM 61 REFRIGERATED MERCHANDISER QTY:3

MANUFACTURER: True Mfg.

MODEL: Specialty Display Model TVM-30-HC~VM03

Dimensions: 54.88(h) x 30.88(w) x 23.88(d)

Description

Visual Refrigerated Merchandiser, two-section, visual merchandiser version 03, (2) glass hinged doors, (4) PVC coated adjustable wire shelves, LED interior lights, black powder coated exterior, white interior with stainless steel floor, leg levelers, R290 Hydrocarbon refrigerant, 1/5 HP, 115v/60/1-ph, 2.1 amps, NEMA 5-15P, cULus, UL EPH Classified, Made in USA

3 ea 7 year compressor warranty, 7 years parts warranty, 7 year labor warranty, standard. Visit www.truemfg.com for specifics.

3 ea Self-contained refrigeration standard

3 ea Exterior: Black powder coated steel, standard

3 ea Interior: White aluminum, standard

3 ea Illuminated sign decal: S-TS-02 "TRUE Stripe" graphic, standard

ITEM 62-68 SPARE NUMBERS

ITEM 69 HOSE REEL QTY: 2

T&S Brass Model B-2339-02

Hose Reel Assembly, enclosed, with 3/8" x 30' ft. hose., flush mount stainless steel control cabinet with locking latch, 1/2" in-line check valves, dual check valve backflow preventer, shut-off valve with 4-arm handle, bi-metallic thermometer with 3" dia. dial face, continuous pressure vacuum breaker, ratcheting system, high flow stainless steel water gun with rubber cover & front style trigger, water hammer arrestor, includes multi-fit bracket, (2) 1/2" NPT female union inlets, 1/2" NPT outlet

ITEM 70-73 SPARE NUMBERS

ITEM 74 ICE MACHINE AND DISPENSER QTY: 2

MANUFACTURER: HOSHIZAKI

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MODEL: DCM-271-BAH

ELECTRICAL: Reference Project drawings for electrical requirements.

Description:

Dimensions: 31.75(h) x 16.63(w) x 24.25(d)

Ice Maker/Water Dispenser, Cubelet-Style, air-cooled, self-contained condenser, production capacity up to 257 lb/24 hours at 70°/50° (196 lb AHRI certified at 90°/70°), 10 lb built-in storage capacity, counter model, (2) sets of LED touch buttons (upper and lower), 10-1/4" cup clearance, protected with H-GUARD Plus Antimicrobial Agent, R-404A refrigerant, 4" legs, 115v/60/1-ph, 8.5 amps, cord & NEMA 5-15P, NSF, UL, ADA Compliant

Warranty: 3-Year parts & labor on entire machine

Warranty: 5-Year parts on compressor, air-cooled condenser

Accessories:

1. Model LP-4 LEG Leg Package, (4) x 4" stainless steel legs

APPROVED ALTERNATES IF MATCH DETAILED SPECIFICATIONS: MANITOWAC

ITEM 74.1 FILTER FOR ICE MACHINE

QTY: 2

MANUFACTURER: HOSHIZAKI/EVERPURE

MODEL: H9320-51 and 9795-80

Description:

Water Filtration System, single configuration, 18.4" H (manifold & cartridge)

Pre-Filter System, E-10 Prefilter, NSF

Accessories:

1. Supply 2 ea replace filters and pre-filter

ITEM 75 BEVERAGE COUNTER

QTY 2

MANUFACTURER: ATLANTA CUSTOM FABRICATORS

MODEL: CUSTOM

ELECTRICAL: Reference Project drawings for electrical requirements.

Description:

Length as shown on drawing x 60" Wide - see drawing for location

Counter height to be 34"

Counter Top to be fabricated using 14 Gauge Stainless Steel WITH 10" EXTENDED TOP IN LUIE OF TRAYSLIDE

Top to be braced with Stainless Steel Hat Channel 14 or 16 Gauge

Counter Base to be fabricated using 18 Gauge Stainless Steel-No Galvanized Accepted Counter

Bodies will be built standard unitized construction

Counter top to be turned down on all sides

Raised Acrylic panels, color to coordinate with Cashier Counters Sound

Deadening Mastic Applied Between Metals

Hole cut in top and fitted with grommet for cords and ice machine drain Duplex receptacle below counter

1 Set of Hinged Doors with Locks at Front of Counter Bottom &

Intermediate Shelves in Cabinet Base

6" SS LEGS WITH BULLET FEET

Unit must be UL & NSF Approved & Labeled

Please submit a full set of shop drawings matching all specifications at time of bid if alternate fabricator not listed is being submitted

Fabrication company must have 10 years' experience in Fabricating Custom Serving Lines, must be a NSF & UL approved shop & all equipment to have NSF & UL labels

ITEM 76 TRAY DRYING RACKS

QTY: 4

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MCKEE PROJECT NO. 25-160B

MANUFACTURER: METRO

MODEL: MAX4-PR48VX4

Description:

MetroMax® 4 Mobile Drying Rack Unit, 48"W x 24"D x 68"H, 4-tier, for trays/cutting boards/sheet pans & steam pans, includes: (4) open shelf frames, (4) 63" mobile posts, (2) cutting board/tray drying racks, (2) pan racks, (4) polymer swivel casters (2 with brakes), built in Microban® antimicrobial product protection, NSF

ITEM 77 SOILED DISHTABLE "L" SHAPED

QTY: 1

MANUFACTURER: ACF

MODEL: SEE DRAWING

Dimensions: SEE DRAWING FS100

Description:

Soiled Dishtable, corner design, " end to corner, L-shaped, left to right operation, WITH LANDING LEDGE THROUGH ROLL DOWN DOOR OPENING, 20" x 20" x 8"D pre-rinse sink, 14/300 stainless steel top, stainless steel H-frame legs, NSF

DISPOSER PROVSION AND PANEL FOR CONTROLS ITEM 79

14/300 stainless steel construction

Capped and Finished Endspalsh, 30" front-to-back, includes end splash

8" Backsplash

Extra Faucet Holes (Set) MODIFIED LOCATION

Landing Ledge

Raised Rolled Edge

Scrap Block, 6-1/2" dia., rubber

Model BF-S Bullet Foot, stainless steel

Model SD Sound Deadening (priced per linear foot)

Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are: Atlanta Custom Fabricators, Commercial Stainless Fabrication, Marietta, GA, Low Temp Manufacturing, Jonesboro, GA., and Advance Tabco.

ITEM 78 HOSE REEL

QTY: 1

MANUFACTURER: FISHER

MODEL: 29851

Description:

Hose Reel Assembly, closed reel rinse wall mounted with spray valve, powder coated steel construction, 30 feet of 3/8"ID, 3 ply hose, working pressure of 200 psi, withstands 160° F water temperature, 1/2" NPT Female garden hose inlet

Accessories:

1. Model 28231 Reel Rinse Installation Kit, wall-mounted

APPROVED ALERNATES IF MATCH THE DETAILED SPECIFICATIONS: T AND S BRASS

ITEM 79 DISPOSAL SYSTEM

QTY:1

MANUFACTURER: HOBART

MODEL: FD4/500+BUILDDUP

Disposer, basic unit only, 5-HP motor, steel housings, adjustable flange feet

1 ea Standard warranty - 1-Year parts, labor & travel time during normal working hours

1 ea Model FD4/500-ELE0KT 208-230/460v/60/3-ph & 208/415v/50/3-ph

1 ea Model CONTROL-GRP60KP Control Panel Group 6, 200-240v/50/3-ph & 200-240/440-480v/60/3-ph

1 ea Model ACCESS-GROUPB Disposer Accessory, GROUP B, includes: vinyl silver-saver splash guard ring, vacuum breaker, water swirl

1 ea Model ADAPTER-7INCH 7" I.D. stainless steel adapter for welding to sink or trough

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MCKEE PROJECT NO. 25-160B

ITEM 80 DISHMACHINE
MANUFACTURER: HOBART
MODEL: CL66-DWR+BUILDDUP

QTY: 1

ELECTRICAL: Reference Project drawings for electrical requirements.
WATER AND WASTE: Reference Project drawings for all requirements.
Description:

Dimensions: 68.5(h) x 44.75(w) x 31.25(d)

Conveyor Dishwasher, single tank with power scrapper; Drain Water Energy Recovery with factory-installed drain water tempering kit; (202) racks/hour, .45 gallon/rack, Complete Delime with Booster Guard, Touch Screen Controls with diagnostics, troubleshooting, and SmartConnect App, capless wash arms, NSF Pot & Pan mode, pumped rinse, insulated hinged doors, cULus, NSF, ENERGY STAR®, Free factory startup for installations within a 100 mile radius of a Hobart service office; installation beyond 100 miles will be charged at the quoted rate by the local Hobart service office

Accessories and Options to be included:

- 1 ea Standard warranty - 1-Year parts, labor & travel time during normal working hours within the USA
- 1 ea Model CL66DWR-HTE15K Electric tank heat 15kW
- 1 ea Model CL66DWR-ELE0CD 480v/60/3-ph
Single point connection standard (field convertible to dual point)
- 1 ea Model CL66DWR-HGTSTD Standard Height 19.5"H x 22"W opening, fits full-sized sheet pan,
horizontal
- 1 ea Model CL66DWR-ERH18K With 18 kW Booster (default)
- 1 ea Model CL66DWR-DIR0LR LEFT TO RIGHT operation
- 1 ea NOTE: For water of 3-grains of hardness or more, Hobart suggests adding a water softener.
- 2 ea Model VNTHD/E-ADJ E-series vent hood domestic (adjustable)
- 8 ea Model DISHRAK-PEG20 Peg Rack
- 3 ea Model DISHRAK-COM20 Combination Rack
- 3 ea Model RACK-HOTEL Hotel Pan Rack, holds (2) 12" x 20" x 4" deep hotel / steam pans; fits
standard height openings of CLEN units
- 3 ea Model BUNPAN-RACK Rack, bun pan
- 3 ea Model SHTPAN-RACK Rack, 6 sheet pan
- 1 ea Model PRESREG-1/20BR 1/2" brass pressure regulator
- 2 ea Model 1/2INSHK-ABSRBR Water Shock Absorber Kit (2 required - 1 each incoming hot and cold
water lines)
- 1 ea Model TBLLIM-CL Table limit switch for CL & CLEN series
- 1 ea Model CURTAIN-KITSTD KIT CURT'N SPLASH Standard E-SERIES
- 1 ea Model CL66EN-BASFETSTD Standard feet
- 1 ea WS40 Water Softening System, 2,527 grains/lb capacity, 5 gallons regeneration volume, & salt
alarm, holds 1 bag of salt
- 2 ea BAGS OF SALT

INSTALLATION OF HOBART DISH MACHINE AND WATER SOFTENER

Description:

CL66 WITH ALL ACCESSORIES. EQUIPMENT TO BE DELIVERED, UNCRATE AND SET IN PLACE BY FOOD SERVICE DEALER AND HOBART SERVICE SHALL SUPPLY FINAL CONNECTIONS.

UTILITY CONNECT: Hobart Service will complete all final utility connections including electrical, water and drains. All properly sized utilities MUST BE located at the final connection with-in 4 feet of the point by the GENERAL CONTRACTOR.

SUPPLIES Electrical/Plumbing misc/supplies are to be included by Hobart Service including any vacuum breakers required by code.

DEMO: Demonstration of proper use and care by a factory authorized sales representative.

START UP: Start up and adjust dish machine by Hobart Service

WARRANTY: Warranty on the machine to be extended to 18 months from date of startup - Dish machine ONLY; this does not include any other accessory, only the dishmachine.

ITEM 81 PANT LEG DUCT
MANUFACTURER: ACF

QTY: 1

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MCKEE PROJECT NO. 25-160B

MODEL: CUSTOM

Description:

S/S Pant Leg Duct with Trim Collar for Dish Machines exceeding 66", 16/300 S/S

Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are: Atlanta Custom Fabricators, Commercial Stainless Fabrication, Marietta, GA, Low Temp Manufacturing, Jonesboro, GA., and Advance Tabco.

ITEM 82: CLEAN DISHTABLE

QTY: 1

MANUFACTURER: ACF

MODEL: CUSTOM

Description:

Clean Dishtable, straight design, 102"W, right to left operation, 14/300 stainless steel top, stainless steel H-frame legs, NSF

Accessories:

1. Tubular Undershelf, 1-5/8" dia. tubular stainless steel construction (priced per foot)
2. Bullet Foot, stainless steel
3. Sound Deadening
4. Removable undershelf

Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are: Atlanta Custom Fabricators, Commercial Stainless Fabrication, Marietta, GA, Low Temp Manufacturing, Jonesboro, GA., and Advance Tabco.

ITEM 83 AMBIENT TRAY DRYER

QTY: 1

MANUFACTURER: SAN-AIRE INDUSTRIES

MODEL: PD-100-M

ELECTRICAL: Reference Project drawings for electrical requirements.

UTILITIES REQUIRED:

ELECTRICAL: 120v/60/1, 4.33amps, 500w, cord with NEMA 5-15P

Description:

PowerDry™ 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

Accessories

1. Wall mounted bracket
2. Model FILTERX4 (SAN206) Filter Set, 6" x 20" x 3/8", washable, for PD-100M/100MCORR/100F, set of 4
3. Model RD-101 RapiDrain™ Kitchenware Drainer, stainless steel construction, 1" x 3/16" flat bar with openings for water flow, 3/8" round rod cross bars, 16 ga. formed ends, 1-1/2" 90° lip
4. Model 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

ITEM 84 SPARE NUMBER

ITEM 85: THREE COMPARTMENT SINK

QTY: 1

MANUFACTURER: ADVANCE TABCO

MODEL: 94-83-60-36RL-FAB-X

Description:

Dimensions: 45(h) x 139(w) x 36(d)

Regaline Sink, 3-compartment, with left & right-hand drainboards, 28" front-to-back x 20"W sink compartments, 14" deep, with 11"H backsplash, stainless steel legs with adjustable left-to-right and front cross rails, 36" drainboards, 1" adjustable bullet feet, 14 gauge 304 stainless steel, overall 36" F/B x 139" L/R, NSF

Accessories:

3 ea Model K-40 Lever Drain, all stainless steel, 2"

3 ea Model K-4 Support Bracket, for lever waste drain handle, (1) support required for each lever drain

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MCKEE PROJECT NO. 25-160B

Supply 3' of removable undershelf on both sides under the drainboards for rack and chemical storage.

6 ft Model FAB-X Undershelf, stainless steel, (per linear foot)-

6 ft Model TA-94 16 gauge 304 stainless steel undershelf upgrade (per linear foot)

PROVIDE PROVISION FOR ITEM 94 HATCO SINK HEATER MODEL 3CS-9-208-3-QS

Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are: Atlanta Custom Fabricators, Commercial Stainless Fabrication, Marietta, GA, Low Temp Manufacturing, Jonesboro, GA., and Advance Tabco.

ITEM 86: FAUCET & PRE-RINSE W/ADD A FAUCET

QTY: 2

MANUFACTURER: FISHER

MODEL: SEE BELOW

Description:

1. Fisher Model 34460

Pre-Rinse Unit, spring style, backsplash mount, 8" centers, 16" riser, 36" hose, 1.15 GPM Ultra-Spray™ PLUS spray valve with built-in spray handle clip & dish guard bumper, lever handles with color coded indexes, add-on faucet with 12" swing spout, includes wall bracket, 1/2" NPT male inlets, brass, ADA Compliant

2. Model 3253 Faucet, wall mount, 8" adjustable centers, 12" swing spout, lever handles with color coded indexes, 1/2" NPT female inlets, brass, ADA Compliant

1 year warranty against defects in materials or workmanship, standard

APPROVED ALTERNATE IF MATCH DETAILED SPECIFICATIONS: T & S BRASS

ITEM 87 STAINLESS STEEL WALL PANELS (DISHROOM)

QTY: 2-LOT

MANUFACTURER: APPROVED FABRICATORS

MODEL: CUSTOM

Description:

1. Provide and install Type 304, 18-8, 22 gauge stainless steel panels on walls as shown on drawings.
2. Attach panels to masonry partitions with mastic cement (liquid nail) and stainless steel fasteners appropriate for walltype.
3. Caulk around panel edges and butt joints with clear silicon sealant.
4. Reference drawing FS501.

ITEM 88 SAFETY LADDER

QTY: 1

MANUFACTURER: ULINE

MODEL: H-3834*

Description:

Safety angel 50 degree incline with 4 each, 24" wide expanded metal steps, 450lb capacity; with 4" diameter casters, 2 swivel-spring loaded and 2 rigid.

Fabricators which are pre-approved for construction of stainless steel custom fabrication (serving line equipment excluded) are: Low Temp Manufacturing, Jonesboro, GA.; Titan Stainless, Pageland, SC and Advance Tabco.

ITEM 89 STAINLESS STEEL WALL PANELS (DINING ROOM)

QTY: 2-LOT

MANUFACTURER: APPROVED FABRICATORS

MODEL: CUSTOM

Description:

1. Provide and install Type 304, 18-8, 22 gauge stainless steel panels on walls as shown on drawings.
2. Attach panels to masonry partitions with mastic cement (liquid nail) and stainless steel fasteners appropriate for walltype.
3. Caulk around panel edges and butt joints with clear silicon sealant.
4. Reference drawing FS501.

ITEM 90 SS PICTURE FRAME FOR DISHROOM
MANUFACTURER: APPROVED FABRICATORS
MODEL: CUSTOM
Description:

QTY: 1-LOT

Provide and install 22 gauge, Type 304, 18-8 stainless steel picture frame with 3" overlay on all sides on customer and operator sides to seal any gaps between units and wall cap. Corners must be welded and ground smooth. Trim is sealed to boxes with clear silicon caulking. Use clear silicon caulking described in this section under Installation. Purpose of trim and caulking is to provide a complete seal between the wall cap and boxes and to close crevices against dirt and vermin. Reference page FS-500 for details

ITEM 91 SS PICTURE FRAME FOR PASS THRU UNITS
MANUFACTURER: APPROVED FABRICATORS
MODEL: CUSTOM
Description:

QTY: 1-LOT

Provide and install 22 gauge, Type 304, 18-8 stainless steel picture frame with 3" overlay on all sides on customer and operator sides to seal any gaps between units and wall cap. Corners must be welded and ground smooth. Trim is sealed to boxes with clear silicon caulking. Use clear silicon caulking described in this section under Installation. Purpose of trim and caulking is to provide a complete seal between the wall cap and boxes and to close crevices against dirt and vermin. Reference page FS-500 for detail (SPECIAL NOTE: IF OWNER PREFERS GAP BETWEEN WALL AND TRIM A SPACE OF THREE INCHES IS REQUIRED FOR CLEANING-SEE DETAIL FS-500 AND 501)

ITEM 92 STAINLESS STEEL WALL CAP
SEE FS501 FOR DETAILS
MANUFACTURE: APPROVED FABRICATORS
MODEL: CUSTOM

QTY: 4

Size: Size and shape as shown on drawings. Cap to be approximate length and width of CMU walls. Cap to be one piece all welded construction.

Description:

1. Cap to be constructed of 16 gauge stainless steel with 3" square turn down on all sides.
2. All corners to be fully welded, ground and polished.
3. Full perimeter #7 hi-lite finish around the top of the wall cap.
4. Cap to be one piece all welded construction.
5. Seal to wall with clear silicon sealant.
6. Reference drawing FS600.

ITEM 93A SMART WALL SHELVING

QTY: 1-LOT

Description:

Smart Wall G3 MetroSeal™ Gray

Provide the following 11'-0" Unit on Tall Wall:

1 ea SW40K4	Wall Track
2 ea SW56K4	Wall Track
6 ea SWU45K4	Uprights
6 ea SWS18K4	18" Shelf Supports
6 ea SWS14K4	14" Shelf Supports
2 ea WG1848K4	18" x 48" Grid
1 ea WG1836K4	18" x 36" Grid
2 ea1848NK4	18" x 48" Metroseal Shelves
1 ea1836NK4	18" x 36" Metroseal Shelves
2 ea 1448NK4	14" x 48" Metroseal Shelves
1 ea 1436NK4	14" x 36" Metroseal Shelves

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Accessories:

8) HK26C	Double Hooks
18) PGHK6K4	Pronged Hooks
5) H210K4	Wire Basket
6) PBA-GSDK4	Light-Duty Shelf

All Items to be packaged together, separate from any other items and marked with the Item number
Below is a sample layout for the accessories for this set up.



ITEM 93B SMART WALL SHELVEING

QTY: 2-LOT

DOUBLE SET UP OVER PREP AREA DOUBLE QUANTITIES BELOW

1 ea	Metro Model WG2436K4 Dimensions: 36(w) x 24(d) SmartWall Wire Grid, 36" x 24", Metroseal Gray epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
1 kt	Model SWGB2 Quick Ship - SmartWall Grid Mounting Bracket Kit for Direct Wall Mount; type 304 Stainless Steel, kit consists of (6) brackets to connect grid to the wall, (1) required per grid
3 ea	Model PGHK6K4 Quick Ship - SmartWall Prong Hook, 6", Metroseal Gray epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection
1 ea	Model H209K4 Quick Ship - SmartWall Storage Basket, 13-3/8"W x 5"D x 7"H, Metroseal Gray epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, NSF
1 ea	Model IWA-12K4 SmartWall Large Utensil Holder, 10-3/8"W x 10-1/2"D, Metroseal Gray epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection epoxy finish
1 ea	Model GBHHK4-S Glove Box Holder, horizontal, (1) box capacity, Metroseal 4 Gray
2 ea	Model HK25C Quick Ship - SmartWall Snap-On Hook, 3-1/2"H, chrome, style B - large, multi-purpose

All Items to be packaged together, separate from any other items and marked with the Item number

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MCKEE PROJECT NO. 25-160B

ITEM 94 SINK HEATEER QTY: 1

MANUFACTURER: HATCO

MODEL: 3CS-9-208-3-QS

Dimensions: 12.63(h) x 6.75(w) x 16.88(d)

Description:

Sink Heater, electric, undersink design, electric operation, stainless steel front, for over 21" square sink area, 9kW, 208v/60/3 delta, NSF, cULus, Made in USA

ITEM 95 ICE MACHINE AND BIN QTY: 1

MANUFACTURER: HOSHIZAKI

MODEL: Model KMD-705MAJ

Description:

Dimensions: 26(h) x 30(w) x 24(d)

Ice Maker, Cube-Style, 30"W, air-cooled, self-contained condenser, production capacity up to 721 lb/24 hours at 70°/50° (620 lb AHRI certified at 90°/70°), stainless steel finish, crescent cube style, R-404A refrigerant, 115v/60/1-ph, 14.3 amps, NSF, UL (Replaces KML-700MAJ)

Warranty: 3-Year parts & labor on entire machine

Warranty: 5-Year parts & labor on evaporator

Accessories:

1 ea Model B-800SF Ice Bin, 48"W, top-hinged front-opening door, 800-lb ice storage capacity, for top-mounted ice makers, stainless steel exterior, painted legs included, protected with H-GUARD Plus Antimicrobial Agent, ETL, ETL-Sanitation

1 ea Warranty: 3-Year parts & labor for bin

1 kt Model HS-2034 Top Kit, 14", ABS

1 kt Model HS-2032 Top Kit, 4", ABS

1 ea Model HS-2131 Top kit extension, for KMD, KMS or FD application on B-800 bins

1 pk Model LP-6 LEG Leg Package, (4) x 6" stainless steel legs

1 ea Model HS-5429 Bin Door Catch (purchase as a service part)

1 ea Model HS-5607 Scoop Holder Kit

APPROVED ALTERNATES IF MATCH DETAILED SPECIFICATIONS: MANITOWAC

ITEM 95.1 FILTER FOR ICE MACHINE QTY: 1

MANUFACTURER: HOSHIZAKI/EVERPURE

MODEL: H9320-51 and 9795-80

Description:

Water Filtration System, single configuration, 18.4" H (manifold & cartridge)

Pre-Filter System, E-10 Prefilter, NSF

Accessories:

1. Supply 2 ea replace filters and pre-filter

ITEM 96 PAPER GOODS STORAGE ROOM SHELVEING QTY: 1-LOT

MANUFACTURER: METRO

MODEL: Super Erecta®

Description:

Four tier shelving units with bottom shelf 8" above finished floor and shelving spaced evenly with top shelf even with top of posts.

Shelf, wire, XX"W x 24"D, Metroseal™ Green epoxy-coated corrosion-resistant finish with Microban® antimicrobial protection, plastic split sleeves are included in each carton, NSF

Model 74PK3 Quick Ship - Super Erecta® SiteSelect™ Post, 74-1/2"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3 Green epoxy coated corrosion-resistant finish with Microban® antimicrobial protection

APPROVED ALERNATES IF MATCH THE DETAILED SPECIFICATIONS: AMCO and ULINE

ITEM 97 BREAK TABLE WITH CHAIRS

QTY: BY OWNER

ITEM 98 & 99 SPARE NUMBERS

ITEM 100: MENU SCREENS/TV

QTY: 3

MANUFACTURER: SAMSUNG

MODEL 55INCH COMMERCIAL 4K UHD DISPLAY, 500 NIT

SUPPLY FIVE YEAR GEEK SQUAD WARRANTY

PROGRAMMING IS NOT INCLUDED

PURCHASE THROUGH BEST BUY OR SIMILAR

ITEM 101: DECORATIVE CROWD CONTROL

QTY: 5-LOTS

MANUFACTURER: PALMER HAMILTON

MODEL Q-LINE SYSTEM

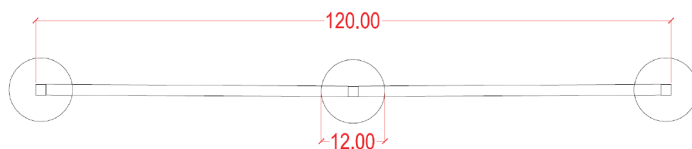
Description:

Custom metal 11-gauge steel with welding joints, powder coated with clear finish with grout-in permanent installation. Laser cut out steel panels. SEE FS100 FOR LENGTHS REQUIRED

Architect/Owner to choose power coat colors of black, gold or sparkle silver.

Architect/Owner to determine artwork and provide to manufacturer for design into panels.

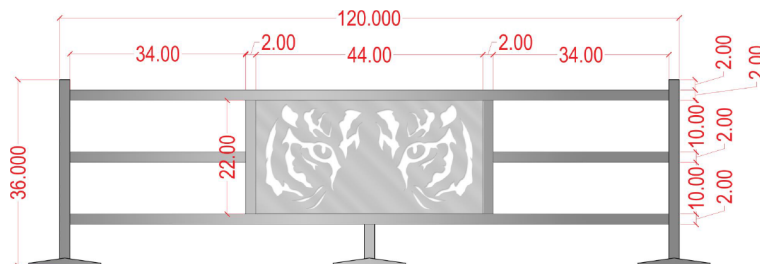
BELOW IS SAMPLE DESIGN-LOGO WILL BE DIFFERENT THAN SHOWN TO MATCH SCHOOL MASCOT OR NAME



DE1-2
Freestanding metal queue rail with custom laser cut-outs.
Each side to have clear acrylic mounted over the cut-out
to protect students from sharp edges. Entire unit
powdercoated in Silver Sparkle

Overall Size: See dimensions on diagrams
Overall Size of Laser Panel: 44"W x 22"H

Quantity: 2



Laser panel – both sides covered with clear acrylic,
mounted to metal laser-cut panel with stainless caps.

ITEM 102: CAN OPENER

QTY: 2 (1 EACH)

MANUFACTURER: EDLUND

MODEL:270/115V

Dimensions: 11.5(h) x 6.75(w) x 10(d)

Can Opener, electric, for heavy volume, 2-speed motor, knife and gear assemblies that are removable for cleaning, recommended for up to 200 cans per day, cULus, CE, NSF certified, 115v/60/1-ph, 1.5 amp

1 ea 3 year limited warranty, standard

MODEL:1S

Can Opener, manual, #1™ with stainless steel base (for cans up to 11" tall) "Old Reliable"™

1 ea 1 year limited warranty, standard

1 ea Model ST-93 Rustproof Can Opener Cleaning Tool, stainless steel bristles and stainless scraper

Improvements to Fairhope High School
Baldwin County Schools
Fairhope, Alabama

FOOD SERVICE EQUIPMENT
114000
58

MCKEE PROJECT NO. 25-160B

ITEM 103 TRAY CARTS-NOT SHOWN ON PLANS
MANUFACTURER: METRO
MODEL: SSD16

QTY: 5

Description

Polymer Dish & Tray Cart, side-load, 38-15/16" x 31-7/8" x 20", holds up to (60) dishes or (80) trays per column, recessed handles, vinyl dust/splash cover, 5" neoprene swivel casters (2 with brakes) polymer construction, Microban® antimicrobial product protection, NSF

END OF SECTION 11 40 00

SECTION 12320 – MEDIA CENTER CASEWORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including General and Special Conditions and Division 1 Specification sections apply to work of this section.
- B. Section Includes:
- C. Furnish and install plastic laminate casework and accessories, instrument storage casework and specialty casework as shown and listed on drawings and specified herein. Includes all countertops, sink cutouts, splashes, supports, shelving, and filler panels necessary for a complete casework installation.
- D. Related Requirements to be Performed by Others:
 - 1. Division 06 Section: "Rough Carpentry" for blocking within walls to adequately support casework.
 - 2. Division 06 Section: "Finish Carpentry"
 - 3. Division 09 Section: "Resilient Base and Accessories" for resilient base applied to manufactured casework.
 - 4. Division 15 Section: "Plumbing" for furnishing, installation, and hook-up of sinks, fixtures, outlets, strainers, tailpieces, traps, vacuum breakers, and stops shall be performed by the plumbing contractor to state and local codes. In all cases, sink cutouts shall be by the casework contractor.
 - 5. Division 16 Section: "Electrical" for the electrical contractor to state and local codes shall perform electrical furnishing, installation, and final connections of wiring, conduit, and/or electrical items within casework.

1.2 REFERENCES

- A. ANSI-A135: for all hardboard.
- B. ANSI-A161.2-1998: for performance of fabricated high-pressure decorative laminate countertops.
- C. ANSI-A208.1-2009: for grade M-3 mat-formed wood particleboard.
- D. BHMA A156.9: for grade-1 hinge requirements.
- E. NEMA 3 LD-2005: for performance requirements of high pressure laminates.
- F. SEFA 8PL Recommended Practices: for cabinet construction.
- G. AWS: American Woodworking Standards, Edition 2.

1.3 DEFINITIONS

- A. Exposed: In casework, surfaces visible when drawers and opaque doors (if any) are closed; behind clear glass doors; bottoms of cabinets 42" or more above finished floor; and tops of cabinets less than 78" above finished floor.
- B. Semi-Exposed: In casework, surfaces that become visible when opaque doors are open or drawers are extended; bottoms of cabinets more than 30" or tops of cabinets less than 42" above finished floor.

1.4 SUBMITTALS

- A. Shop Drawings:
 - 1. Comply with Division 1.
 - 2. Submit three sets of laser quality, 11 x 17 shop drawings consisting of:

- a. Finish, hardware, construction options selection sheet.
 - b. Small scale floor plan showing casework in relation to the building.
 - c. Large scale elevations and plan views.
 - d. Cross-sections; service runs; locations of blocking within walls (blocking is done by others); rough-in requirements and, sink centerlines
 3. Approved shop drawings to be returned to manufacturer at least 60 days before production.
 4. Project Architect and Construction Manager must approve all items prior to fabrication and delivery of casework.
 5. Manufacturer and/or Manufacturer's rep verifies all critical building dimensions prior to fabrication.
- B. Samples:
1. Submit one set of laminate color brochures from standard laminate manufacturers Wilsonart, Formica, Pionite, and Nevamar.
 2. Submit one edge color sample chain and one set of interior colors samples.
 3. Submit catalog showing construction details, material specifications and hardware specifications of all items used.
- C. Warranty: Provide sample warranty document stating specified terms as referenced herein.

1.5 QUALITY ASSURANCE

- A. Unless otherwise indicated, comply with AWI, for grades of interior architectural woodwork, construction, finishes and other requirements:

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Acceptance Requirements:
1. Deliver casework once painting, and similar requirements have been completed that will not damage casework. This includes ensuring spaces are enclosed and weather tight.
 2. All casework shall be blanket wrapped for protection during shipping.
- B. Storage and Handling:
1. Casework must be protected from dust, dirt and/or other trades.
 2. Countertops are stacked, properly supported and spaced evenly to avoid warping. Large pieces are stacked first on the pallets with shorter pieces stacked on top.

1.7 SITE CONDITIONS

- A. Ambient Conditions:
1. Do not deliver or install the casework until concrete, masonry, and drywall/plaster work is dry; ambient relative humidity is maintained between 25 – 55% prior to delivery and throughout the life of installation; and the temperature is controlled above 55°F.
 2. Casework shall not be stored or installed in non-climate controlled conditions.
 3. If ambient conditions are not met at the time of requested delivery, the general contractor or owner must provide the manufacture a letter releasing manufacturer from any liability and responsibility from any warranty or damage resulting from not complying with required ambient conditions.

1.8 WARRANTY

- A. Manufacture shall offer a one year warranty to the original owner against defective material and workmanship.

1. The warranty specifically does not cover any product or hardware, which has been incorrectly installed, including poor climate conditions, exposed to excessive loads or abuse.
2. All non-casework items supplied, but not manufactured at the manufacture shall be covered under the original manufacturers' warranty.

PART 2- PRODUCTS

2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 1. Case Systems (Basis of Design), 2700 James Savage Road, Midland, Michigan 48642 (989) 496-9510
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect not less than Ten (10) days prior to scheduled bid opening.

2.2 MATERIALS

- A. Provide Plastic Laminate Faced Cabinets Manufactured with:
 1. Particleboard Core:
 - a. All particleboard shall be Grade M-3i and shall meet or exceed all requirements as set by ANSI-A208.1-2016.
 - i. Modulus of Rupture 2176 psi
 - ii. Modulus of Elasticity 362600 psi
 - iii. Internal Bond 73 psi
 - iv. Linear Expansion 0.40%
 - v. Thickness Tolerance+/- 0.008"
 - vi. Face Screw Holding 225 pounds Min
 2. MR (Moisture Resistant)/FSC® Core shall be:
 - a. Interior-Grade moisture resistant particleboard.
 - b. Meet or exceed M-3i Grade, according ANSI-A208.1-2016.
 3. Low Emitting Core shall be:
 - a. ULEF/FSC® (No added Urea Formaldehyde) M-2 Particleboard:
 - i. For casework core having recycled content.
 - ii. For casework core being manufactured without the use of urea formaldehyde.
 - iii. For products having chain-of-custody certificates certifying that the wood used in the casework complies with FSC® requirements.
 - b. ULEF/FSC® (No added Urea Formaldehyde) Plywood:
 - i. Plywood that meets or exceeds the standards set forth by the APA for structural use panels.
 - ii. For casework core being manufactured without the use of urea formaldehyde.
 - iii. For products having chain-of-custody certificates certifying that the wood used in the casework complies with FSC® requirements.
 - c. FSC® M-3i Particleboard:
 - i. For products having chain-of-custody certificates certifying that the wood used in the casework complies with FSC® requirements.

- d. FSC® Plywood:
 - i. For products having chain-of-custody certificates certifying that the wood used in the casework complies with FSC® requirements.
- B. Cabinet Joinery:
 - 1. Concealed Interlocking Mechanical Fasteners or Dowel construction: For cabinet body components. Manufacturer's discretion on best suited joinery method for project.
 - 2. Construction: Meets requirements in AWS Manual, Edition 2, including errata and appendix section.
- C. Surface Material:
 - 1. Acceptable laminate color, pattern, and finish as either scheduled or otherwise indicated on drawings or as selected by Architect from manufacturer's standards types and nominal thickness including:
 - a. Vertical surface decorative grade VGS.
 - a. General purpose decorative grade HGS.
 - b. Cabinet decorative liner grade CLS.
 - c. Non-decorative backer grade BKH.
 - d. Thermally fused melamine laminate.
 - e. Chemical resistant decorative laminate.
- D. Edge banding:
 - 1. PVC
 - a. Shall be applied utilizing hot melt adhesive and radiused by automatic trimmers. Edging shall be available in a variety of color options.
- E. Adhesives:
 - 1. PVA
 - a. Adhesive shall be mechanically applied.
 - b. ULEF, no VOC
 - 2. EVA
 - a. Adhesive shall be mechanically applied.

2.3 FABRICATION

- A. General Cabinet Body Construction:
 - 1. Cabinet Box Style shall be [Standard: Reveal Overlay] or [Flush Inset Fronts].
 - 2. Cabinet Box Core shall be [Standard: Particleboard] or [ULEF/FSC® Plywood] or [MR/FSC® Board] or [ULEF/FSC® Particleboard] or [FSC® Particleboard] or [FSC® Plywood].
 - 3. Bottoms and ends of cabinets, and tops of tall cabinets and tops and bottoms of wall cabinets (all structural components) shall be ¾"-inch thick.
 - 4. All panels shall be manufactured with balanced construction.
 - 5. Fixed interior components such as fixed shelves, dividers, and cubicle compartments shall be full ¾" thick and attached with concealed interlocking mechanical fasteners.
 - 6. Cabinet body exterior surfaces shall be: [Standard: VGS] or [Tango Thermally Fused] or [Thermally Fused] or [Decorative Thermally Fused] or [HGS] or [Chemical Resistant Laminate].
 - 7. Cabinet finished interior options shall be: [Standard: Finished] or [Finished at All] or

8. [Finished Where Noted] or [Finished At Opens].
 9. Cabinet body interior surfaces shall be: [Standard: Thermally Fused] or [Tango Thermally Fused] or [Decorative Thermally Fused] or [Cabinet Liner Grade CLS] or [VGS] or [HGS] or [Chemical Resistant Laminate].
 10. Cabinet body front edge shall be: [Standard: .020" PVC] or [3mm PVC]. Mounting stretchers are 3/4" thick structural components fastened to end panels and back by mechanical fasteners, and are concealed by the cabinet back.
 11. When the rear of a cabinet is exposed, a separate finished 3/4" thick decorative laminate back panel may be specified.
 12. Backs of cabinets are 1/2" thick surfaced both sides for balanced construction and fully captured on both sides and bottom.
 13. A 5mm diameter row hole pattern 32mm (1-1/4") on center shall be bored in cabinet ends for adjustable shelves. This row hole pattern shall also serve for hardware mounting and replacement and/or relocation of cabinet components.
- B. Base Cabinet Construction:
1. All base cabinets, except sink cabinets, shall have a solid 3/4" thick sub-top of core (as specified above), fastened between the ends with interlocking mechanical fasteners.
 2. Sink cabinets with a split removable back panel shall have a formed metal front brace, and steel corner gussets shall be utilized to support and securely fasten top in all four corners. Front brace shall be powder coated black.
- C. Tall Cabinet Construction:
1. All tall cabinets shall be provided with an intermediate fixed shelf to maintain internal dimensional stability under heavy loading conditions as well as an intermediate 3/4" thick stretcher located behind the back panel and be secured between the cabinet ends with mechanical fasteners. The stretcher shall be secured to the shelf through the back with #8 x 2" plated flat head screws.
- D. Wall Cabinet Construction:
1. A lower 3/4" thick stretcher shall be located behind the back panel and attached between the end panels with mechanical fasteners. The stretcher is also secured through the back and into the cabinet bottom. Wall cabinets over 36" in width shall receive a fixed intermediate partition.
 2. All wall cabinet exterior bottoms shall be: [Standard: Match Standard Interior] or
 3. [Match Exterior Surface].
 4. All wall cabinet tops shall be: [Standard: 3/4-inch] or [1-inch].
- E. Tall and Wall Cabinet Top Edges shall be: [Standard: Raw] or [.020" PVC at Top of End Panels, Stretchers & Back].
- F. Tall, Wall and Hutch Exterior Top Finish shall be: [CLS to Match Standard Interior] or [HPL to Match Exterior Surface] or [Material Match Standard Interior].
- G. Base, Tall, Wall and Hutch Upper Door Reveal shall be: [Standard: 15mm Reveal] or [3mm (1/8") Reveal].
- H. Toe Base of Cabinet:
1. Individual bases shall be constructed of: [Standard: Particleboard] or [MR/FSC® Board] or [ULEF/FSC® Particleboard] or [FSC® Particleboard] or [ULEF/FSC®
 2. Plywood] or [Pressure Treated Plywood] or [Raw Exterior Glue Plywood] or [FSC® Pressure Treated Plywood] or [FSC® Raw Exterior Glue Plywood] factory

3. applied to base and tall cabinets and shall support and carry the load of the end panels, and the cabinet bottom, directly to the floor. The base shall be let in from the sides and back of the cabinet to allow cabinets to be installed tightly together and tight against a wall, also to conceal the top edge of applied vinyl base molding (not supplied by casework manufacturer). There shall be a front to back center support for all bases over 30" wide.
 4. Toe Base Height [Standard: 96mm] or [102mm] or [152mm] or [Other: As Specified].
 5. Toe Base Options [Standard: Attached] or [3/4" Raw Loose Base Strips] or [No Base].
- I. Drawer Fronts and Solid Doors:
1. All drawer fronts and solid door components shall be: [Standard: Particleboard] or [ULEF/FSC® Plywood] or [MR/FSC® Board] or [ULEF/FSC® Particleboard] or [FSC® Particleboard] or [FSC® Plywood] surfaced both sides for balanced construction.
 2. Options shall be: [Standard: HPL Door and Drawer Front Exterior and Grade CLS on Interior] or [HPL Door Interior and Exterior (both sides match front surface color)] or [HPL Door Interior and Exterior (inside surface match interior color)] or [HPL Door and Drawer Interior and Exterior (both sides match front surface color)] or [Corkboard Doors] or [True 3/4" Core].
 3. Surfaces shall be: [Standard: HPL Grade VGS] or [HPL Grade HGS] or [Thermally Fused] or [Decorative Thermally Fused] or [Chemical Resistant].
 4. Door and drawer front edge shall be: [Standard: 3mm PVC] or [.020" PVC].
- J. Drawer Boxes:
1. Drawer box constructed with a full 1/2" thick core shall be: [Standard: Particleboard] or [ULEF/FSC® Plywood] or [MR/FSC® Board] or [ULEF/FSC® Particleboard] or [FSC® Particleboard] or [FSC® Plywood] or [Pre-finished Hardwood Veneer Plywood] non-racking, non-deflecting platform bottom that is carried directly by "L" shaped, bottom mount drawer glides.
 2. Drawer box at finished interiors shall be: [Standard: Surface to Match Standard Interior] or [Surface to Match Finished Interior] or [Hardwood Veneer Plywood] or [Cabinet Liner Surface to Match Standard Interior].
 3. [Standard: Slides are secured with 1-1/4" long screws driven through the platform and into the sides. Drawer box sides, backs, sub-front, and bottom shall be 1/2". The top edge shall be nominal 1mm (.020") PVC matching the drawer color. Drawer box corners shall be joined with fluted hardwood dowels and glue spaced at a minimum of 32mm on center. Drawer box fronts shall be removable and attached to drawer box sub-front with screws from inside of drawer. Horizontal parting rails between drawers shall be 3/4" thick core, with balanced surfaces, secured to and further reinforcing cabinet ends. File drawer box shall have full-height sides supporting a heavy-duty support rail for hanging file folders] or [Full-height sides and back on all drawer boxes] or [Pre-finished dovetail drawer boxes – if selecting this drawer box construction, drawer box core must be pre-finished hardwood veneer plywood].
- K. Doors:
1. Solid Doors shall be: [Standard: 3/4" thick core].
 2. Glazed Doors, Framed shall be:
 - a. Hinged or sliding 3/4" thick, framed doors shall be: [None] or [Standard: Clear Acrylic Panels] or [Safety Glass Panels] or [Smoked Safety Glass Panels] or [Tempered Glass Panels] or [Smoked Tempered Glass Panels]. Panels must be 1/4" thick. Glazing panel shall be set into the doorframe without the use of a separate molding. Glazing shall be held in place with removable stops.
 3. Glazed Doors, Frameless shall be:
 - a. Sliding, 1/4" thick tempered glass panels. All edges to be radius ground and polished.
 4. Sliding Doors shall be:

- a. Extruded aluminum upper track with anodized finish. All tall cabinets shall receive two hanging brackets per door with two rollers per bracket. All other cabinets shall receive two hanging brackets per door with one roller per bracket. The bottom of door shall be captured in a retainer to prevent doors from swinging in or out.
- 5. Pocket Doors shall be:
 - a. Zinc plated, self-closing, three-way adjustable geometric door hinge with precision steel ball bearing slides.
- 6. Grille Doors shall be:
 - a. Powder coated platinum finish, grille doors where shown or noted with model number shall have individual lock hasps and number plates.
 - b. Single wide grille doors where shown or noted shall have individual, zinc plated stay-close wire door latches. The wire door latch is a robust, door/side- mounted design made of 13-gauge cold rolled steel. A self-latching lever smoothly travels over the hasp and falls into a positive latched, stay-close position. For security, the door can be locked with a padlock. This option is not available on cabinets with double door configurations.
- L. Shelves:
 - 1. Adjustable:
 - a. Adjustable shelves shall be: [Standard: Particleboard] or [ULEF/FSC Plywood] or [MR/FSC® Board] or [ULEF/FSC® Particleboard] or [FSC® Particleboard] or [FSC® Plywood] core, with balanced surfaces.
 - b. Adjustable shelves in closed cabinets shall be: [Standard: ¾" Shelves, 1" for Shelves Over 36" Wide and Open Cabinets] or [¾" Shelves, 1" for Shelves Over 33" Wide] or [¾" Shelves, 1" for Shelves Over 30" Wide] or [¾" Shelves, 1" for Shelves Over 27" Wide] or [¾" Shelves, 1" for Shelves Over 24" Wide] or [1" for All Shelves].
 - c. All adjustable shelves in open cabinets shall be: 1" thick, except for special use cabinets such as mail, cubical, instrument or locker type units.
 - d. Adjustable shelf edge on open cabinets shall be: [Standard: .020" Match Edge at Front] or [.020" PVC at Front Edge] or [.020" PVC at Front and Back Edges] or [.020" PVC on All Four Edges] or [3mm PVC on Front Edge] or [3mm on Front and Back Edges] or [3mm on Front and Back Edges, .020" on Sides] or [3mm on Front, .020" on Back and Sides] or [3mm on All Four Edges].
 - e. Adjustable shelf edge on closed cabinets shall be: [Standard: .020" Match Edge at Front] or [.020" PVC at Front Edge] or [.020" PVC at Front and Back Edges] or [.020" PVC on All Four Edges] or [3mm PVC on Front Edge] or [3mm on Front and Back Edges] or [3mm on Front and Back Edges, .020" on Sides] or [3mm on Front, .020" on Back and Sides] or [3mm on All Four Edges].
 - f. Adjustable shelf shall be set back [Standard: 15mm from the front] or [23mm setback option when locks are used].
 - 2. Fixed:
 - a. Fixed shelves shall be: [Standard: Particleboard] or [ULEF/FSC® Plywood] or [MR/FSC® Board] or [ULEF/FSC® Particleboard] or [FSC® Particleboard] or [FSC® Plywood].
 - b. Fixed shelves shall be: [Standard: ¾" Shelves, 1" at Opens] or [¾" Shelves, 1" for Shelves Over 36" Wide and Open Cabinets] or [¾" Shelves, 1" for Shelves Over 33" Wide] or [¾" Shelves, 1" for Shelves Over 30" Wide] or [¾" Shelves, 1" for Shelves Over 27" Wide] or [¾" Shelves, 1" for Shelves Over 24" Wide] or [1" for All Shelves].
 - c. Fixed shelf surfaces on closed cabinets shall be: [Standard: Match Interior Selections] or [Grade CLS on Both Sides] or [VGS HPL on Both Sides] or [HGS on Both Sides] or [Chemical Resistant Laminate].

- d. Fixed shelf surfaces on open cabinets shall be: [Standard: Match Interior Selections] or [Grade CLS on Both Sides] or [VGS on Both Sides] or [HGS on Both Sides] or [Chemical Resistant Laminate].
 - 3. Wall shelving selections for model numbers R204, R205, R206 only shall be:
 - a. [Standard: .020" PVC] or [3mm PVC].
 - b. [Standard: Particleboard] or [ULEF/FSC® Plywood] or [MR/FSC® Board] or
 - c. [ULEF/FSC® Particleboard] or [FSC® Particleboard] or [FSC® Plywood].
 - d. [Standard: Thermally Fused] or [Decorative Thermally Fused] or [Grade VGS] or [Grade HGS] or [Chemical Resistant Laminate].
 - 4. Wire Shelves shall be white, plastic coated.
 - 5. Hardboard Shelves shall be ¼" thick tempered hardboard. All hardboard shall have a "S2S" surface finish.
- M. Specialty Products:
- 1. Rail Mounted Cabinets:
 - a. Wall mounted continuous support rail and cabinet mounted interface hooks shall be an anodized finished extruded aluminum.
 - b. Wall mount support shall come factory pre-drilled 8" on center for mounting to 16" or 24" on center studs and in-wall blocking. Blocking is required per manufacturers' recommendations and is supplied and installed by other specified trade.
 - c. Cabinet interface hooks shall be pre-mounted at the factory with deep thread 7mm x 70mm specialty screws. Screws shall not be visible in cabinet interior. Hook styles shall be available for single and triple height adjustment based on the cabinet model number.
 - d. Cabinet lower leveling bar shall be adjustable from cabinet interior and shall allow for plus or minus 3/8" plumb adjustment without additional materials.
 - e. Recommended maximum load capacity for base cabinets with a 1-1/8" standard laminate countertop, wall cabinets and tall cabinets shall be 100 lbs per linear foot.
 - f. Rail mounted casework shall be vertically (dependent on model #) and horizontally adjustable.
 - g. Core material only available in grade M3 particleboard core.
 - h. [Optional Leg Supports shall be Available to Accommodate Heavier Loads for Tall and Base Rail Cabinets].
 - 2. Music Cabinets:
 - a. Shelves:
 - i. Core shall be: [Standard: Particleboard] or [Plywood] or [MR/FSC® Board] or [ULEF/FSC® Particleboard] or [ULEF/FSC® Plywood] or [FSC® Particleboard] or [FSC® Plywood].
 - ii. Surface shall be: [Heavy-Duty Shelves shall be core (specified above) with tempered hardboard top and bottom sandwich type construction. Front edge of shelves and cabinet end panels shall be: high impact radiuses 3mm PVC] or [Top Surface Thermoplastic Shelves shall be core (specified above) heavy-duty continuous thermoplastic, permanently bonded to core and tight fitting to cabinet back and end panels. Front edge of shelves and cabinet end panels shall be high impact radiused 3mm PVC] or ["Caseliner™" Shelf shall be melamine faced, charcoal grey and
 - iii. ¾" thick core (specified above). Shelf top shall have drainage grooves running from back to front with a radiused top front edge. Top surface of shelf and front

shall be coated with a Polyurethane/Polyurea Elastomer coating to provide superior impact resistance and to allow top and front surface of shelf to be waterproof]. Plywood core is not available with this surface.

b. Doors:

- i. [Grille doors shall have individual lock hasps, number plates and be powder coated with a platinum finish] or [Grille doors where shown or noted shall have individual stay-close wire door latches. This wire door latch is a robust, door/side-mounted design made of 13-gauge cold rolled steel in a zinc finish. A self-latching lever smoothly travels over the hasp and falls into a positive latched, stay-close position. For security, the door can be locked with a padlock. This option is not available on cabinets with double door configurations] or [Grille doors shall be powder coated with a platinum finish and shall be attached to cabinet end panels by means of thru bolting].
- ii. $\frac{3}{4}$ " thick Solid Core Door shall be: [Standard: Particleboard] or [Plywood] or [MR/FSC Board] or [ULEF/FSC® Particleboard] or [ULEF/FSC® Plywood] or [FSC® Particleboard] or [FSC® Plywood], with HPL front and CLS liner back used for balanced construction. Doors shall be provided with individual lock hasps.
- iii. [Optional: Sliding latch on Solid Core Door Only].

c. Instrument Cabinet Interior Surface shall be: [Standard: Match Standard Interior] or [Match Finished Interior].

3. Mobiles:

- a. Mobile top shall have 3mm edging and shall have an overhang at front, sides and rear to act as a bumper. Mobile top shall be available in a variety of colors. Mobile unit shall be constructed of a $\frac{3}{4}$ " thick core, as specified, and a 1" thick core platform with 3mm edging. Sides, back and casters will be securely fastened using mechanical fasteners.
- b. Mobile units shall be available with either 4" or 6" nominal height casters.
- c. Mobile back shall be 1" thick specified core.
- d. Mobile unit shall have a maximum load rating of 500 pounds.
- e. Mobiles will have a $\frac{3}{4}$ " thick finished top with material as specified below.
- f. [Standard: VGS laminate] or [No Top] or [HGS laminate] or [Chemical Resistant Laminate].

4. Sloped Tops shall be a separate unit from the cabinet and set at a 30° angle.

5. Locker construction shall match general casework section with the exception that all fixed shelves are $\frac{3}{4}$ " thick.

- a. Locker top finish shall be: [Standard: Unfinished] or [Finished Edge and Surface].

6. Library Furniture shall be:

- a. Fully modular and moveable construction.
- b. All uprights and shelves shall be: 1" thick components.
- c. Laminated shelves shall have 3mm PVC radiused edges.
- d. Drawer boxes shall be: non-racking, non-deflecting platform drawer box with $\frac{1}{2}$ " thick bottoms.
- e. $\frac{1}{2}$ " thick inset and finished backs.
- f. Thermally Fused laminate, which exceeds ANSI/NEMA LD3- 2005 for GP-28 performance.

- g. 1" thick work surfaces with high-pressure finish.
 - h. Materials:
 - i. Finish of surfaces:
 - i. All interior and exterior surfaces shall be: laminated with [Standard: Decorative Thermally Fused Melamine] or [All VGS] which meets the performance standards of ANSI/NEMA LD3-2005 for GP-28. All panels shall be balanced construction.
 - j. Edges:
 - i. All leading edges shall be 3mm PVC. The PVC shall be machine applied utilizing hot melt adhesive and radiused by automatic trimmers. All four-end panel edges shall be edged for true modularity.
 - ii. Other edges utilizing PVC shall be machine applied with EVA adhesive and .020" PVC.
 - k. Construction:
 - i. All bookshelves shall be of starter/adder design. Units shall be easily assembled and disassembled for ease of modularity. All bookshelves shall be constructed with finished backs and end panels for use as free standing or wall mounted. Modular construction shall allow Owner to move or reuse for either location.
 - ii. Bookshelf body panels to be assembled using thru-bolt design.
 - iii. All bookshelf end panels shall be 1" thick. All work surfaces shall be 1" thick.
 - iv. All back panels shall be 1/2" thick particleboard, finished both sides.
 - v. Shelves shall be adjustable 32mm (1-1/4") on center utilizing nickel plated shelf clips or optional anti-tilt, twin pin locking clips.
 - vi. Shelving shall not deflect in excess of 1/4", when loaded at 40 lbs/sq. ft., maintaining a maximum cabinet width of 36".
 - vii. Drawer boxes shall be constructed with full 1/2" thick non-racking, non-deflecting platform bottom which is carried directly by "L" shaped, self closing, bottom mounted drawer glides with life time warranty by the slide manufacturer.
 - viii. Table frames shall be furniture construction type with solid oak legs with adjustable feet.
 - ix. Circulation desk shall be fully modular for owner's ease of re-design.
 - x. All library shelving units shall ship knockdown.
7. Countertops:
- a. High-pressure decorative laminate, nominal [1-1/8" thick solid core] or [1" thick solid core] or [3/4" thick solid core] or [1-1/2" thick buildup], conforming to NEMA Standard LD3-2005 and ANSI A161.2-1998.
 - i. General Purpose [Standard: HGS] or [Chemical Resistant Laminate]
 - i. on horizontal surface.
 - ii. Laminate bonded to M-2 [Standard: Particleboard] or [ULEF Plywood] [MR/FSC® Board] or [ULEF/FSC® Particleboard] or [FSC® Particleboard] or [FSC® Plywood – available with 3/4" or 1-1/2" thick buildup] core with PVA rigid adhesives. Core shall be balanced with backing Grade BKL.
 - iii. All joints shall be secured with biscuits for alignment and tight joint fasteners.
 - iv. Provide 4" high back splashes with thickness matching countertop thickness where shown and at all ends abutting walls and adjacent cabinets.

- v. Provide edges [Standard: 3mm] or [Self edge of the same material as top].
- vi. The maximum lengths of HPL buildup particleboard tops is 12' and the maximum lengths of HPL buildup plywood tops is 8'.
- b. Epoxy Resin:
 - i. Top shall be 1" thick with 1/32" chamfer on finished Epoxy edges and shall be provided with drip grooves on under side of finished top at exposed edges.
- c. Phenolic Resin:
 - i. Shall be: [3/4"] or [1"] thickness with 1/8" radius edge and drip groove on underside of top.
 - ii. Shall be made of thermosetting resins, homogeneously reinforced with wood based fibers, manufactured under high heat and high pressure.
 - iii. Non-porous, water resistant with anti-microbial properties without the use of coatings or additives.

2.4 ACCESSORIES

A. Hardware:

1. Hinges:

- a. [5-Knuckle Hinges / Reveal Overlay: Standard: Hinges shall be: .095" thick steel five-knuckle hospital-tip, institutional Grade (Grade 1 per ANSI/BHMA A156.9) quality with .187" diameter tight pin. Each hinge shall be secured with a minimum of nine No. 8 screws. Hinge shall permit door to swing 270 degrees without binding. Doors less than 48" in height shall have two hinges. Doors over 48" in height shall have three hinges] or [Concealed Hinges: Hinges shall be: fully concealed, nickel-plated, self-closing, 170 degree swing European style with six way adjustment. Hinge shall be: a minimum of Grade 2 per ANSI/BHMA A156.9. Hinge shall permit door to swing 170 degrees without binding. Doors under 36" high shall have two hinges; 36"-72" high shall have three hinges; over 72" high shall have four hinges] or [3 Knuckle Hinges: Hinges shall be: nickel-plated semi-concealed, self-closing, 270-degree swing, 3-knuckle style with four-way adjustment. Hinge shall be: a minimum of Grade 1 per ANSI/BHMA A156.9. Hinge shall permit door to swing 270 degrees without binding. Doors under 36" high shall have two hinges; 36"-72" high shall have three hinges; over 72" high shall have four hinges] or [Flush Inset 5 Knuckle Hinge: Hinges shall be: .083" thick steel, five-knuckle hospital-tip institutional Grade (Grade 1 per ANSI/BHMA A156.9) quality with .187" diameter tight pin. Each hinge shall be: secured with a minimum of eight No. 8 screws. Hinge shall permit door to swing 270 degrees without binding. Doors less than 48" in height shall have two hinges. Doors over 48" in height shall have three hinges].

2. Pulls:

- a. One pull shall be: located at the centerline of the drawer, regardless of width, to ensure ease of operation and maximize drawer slide life.
- b. [Standard: Anodized aluminum wire pull, 8mm diameter with 96mm
- c. O.C. mounting holes] or [Standard: Plastic contour pull, surface mounted, 35mm x 116 mm overall size with 96mm O.C. mounting
- d. holes] or [Epoxy coated wire pull, 8mm diameter with 96mm O.C. mounting holes] or [Brass core wire pull, 8mm diameter with 96mm
- e. O.C. mounting holes] or [Stainless steel wire pull, 8mm diameter with 96mm O.C. mounting holes] or [Semi recessed, 110mm x 32mm with 96mm O.C. mounting holes] or [Semi recessed, oversized, 134mm x 43mm with 117.5mm O.C. mounting holes] or [No Drill/No Pull] or [Drill/No Pull] or [Custom Pull: As Specified].

3. Drawer Slides:

- a. [Standard drawer: Self-closing, bottom mount epoxy coated with captive roller and positive in stop. Slide shall have 100 lb. load rating, must be: self-closing and must prevent drawer fronts from contacting the cabinet body. Drawer slides must meet or exceed Grade 1 requirements per ANSI A156.9/BHMA with full extension slides on file and paper storage] or [Full extension Bottom Mount Slides on All] or [KV8400 at Standard Drawers, KV8500 at six increment Drawers and Deeper] or [KV8400 at All Drawers] or [KV8400 at Standard Drawers and KV8500 at File Drawers] or [Accuride 3832 at Standard Drawers and 4032 at 6 Increment Drawers and Deeper] or [Accuride 3832 at All Drawers] or [Accuride 3832 at Standard Drawers and 4032 at File Drawers]. There may be product limitations depending on choice of drawerslide. Please consult your Case Systems dealer for the best drawerslide solution for your project.
- b. File drawer: Full extension, bottom mount epoxy coated with captive roller and positive in stop. Slide shall have 100lb. load rating, must be: full extension, and prevent drawer fronts from contacting the cabinet body. Drawer slides must meet or exceed Grade 1 requirements per ANSI/BHMA.

4. Wall Shelving Hardware:

- a. [Standard duty wall shelving hardware, including standards and brackets, are available in an anochrome finish] or [Heavy-duty wall shelving hardware, including standards and brackets, are available in an anochrome finish].
- b. Bracket Mounted Shelf Core shall be: [Standard: Particleboard] or [MR/FSC® Board] or [ULEF/FSC® Particleboard] or [ULEF/FSC® Plywood] or [FSC® Particleboard] or [FSC® Plywood].
- c. Bracket Mounted Shelf Edge shall be: [020"] or [3mm].
- d. Bracket Mounted Shelf Surface shall be: [VGS laminate] or [HGS laminate] or [Chemical Resistant Laminate] or [Decorative Thermally Fused] or [Thermally Fused].

5. Shelf Clips:

- a. [Standard: Plastic]
 - i. Shelf clips shall be injected molded clear plastic, with a double pin engagement 32mm on center and shall have 3/4" and 1" anti-tip locking tabs as approved in AWI 400B-T-9 for premium Grade.
 - ii. iShelf clips shall be: single pin plastic shelf clip with anti-tip locking tabs, used for all 1/4" hardboard shelves.

6. Coat Hooks shall be Zinc plated, single prong and double prong.

7. Closet Rods shall be Zinc plated rod, 1" diameter with captive sockets.

8. Mirrors:

- a. Teacher wardrobe mirrors to be 8" x 10".

9. Label Holders shall be on [Standard: None] or [All Drawers] or [All Doors] or [All Doors and All Drawers] or [File Drawers Only] or [Left Door Only] or [Right Door Only] or [Standard Drawers Only].

10. Locks (where shown or noted only):

- a. Lock Locations:
 - i. [Standard: No Locks] or [Selected Cabinets Shown on Drawings] or [Locks at All] or [Lock Bottom Drawers Only] or [Locks at Doors Only] or [Locks at All Drawers Only] or [Locks at File Drawers Only] or [Locks on Top Drawers Only].

b. Lock Type:

- i. [Standard Lock: Five disc tumbler cam locks, chrome plated steel faceplate. All locks keyed alike or keyed differently by room and master keyed. Shall permit a minimum of 50 keying options. Lock core is removable permitting owner to easily change lock arrangements. Inactive door of base and wall cabinets shall be: secured by using an elbow catch, or a chain pull for tall cabinets] or [Five pin lock, pin tumbler, trim ring provided, special cams required] or [Dead bolt style] or [Best – 5E] or [Olympus - #100DR for Doors and Olympus #200DW for Drawers]. There may be product limitations depending on choice of lock. Please consult your Case Systems dealer for the best lock solution for your project.

11. Casters:

- a. Shall be available in both 4" (3" diameter wheel) and 6" (5" diameter wheel) nominal heights. 4" casters must have a minimum load rating of 165 lbs per caster and the 6" casters must have a minimum load rating of 200 lbs per caster. Shall be ball bearing with 360° swivel. Shall have non-marring wheels available in both locking and non-locking.

12. Catches:

- a. Chain Pulls shall be zinc plated, spring loaded door catch used to hold door securely shut.
- b. Chain Stops shall be zinc plated, looped chain used to limit door swing as specified, mounting plate at each end of chain shall use (4) #7 x 5/8" screws to secure to cabinet door and end panel. They shall be on cabinets at adjoining walls and where casework and countertops can interfere with the door swing of the tall cabinet.
- c. Elbow Catch shall be chrome plated, spring loaded, used to hold non-locking door securely shut.
- d. Roller Catch, (not used with self-closing hinges) shall have: heavy-duty, spring-loaded roller, with molded plastic bumper mounted at door top to keep door securely shut.
- e. Magnetic Catch, (not used with self-closing hinges) shall have: white plastic housing with two 32mm spaced, elongated holes for screw-attachment to allow adjustability.
- f. Catches shall be: [Standard: Magnetic at Base and Wall, 1 Roller at Tall] or [1 Roller at All] or [Magnetic at Base and Wall, 2 Roller at Tall] or [1 Roller at All, 2 Rollers at Talls] or [Standard: None for 3 Knuckle or Concealed Hinges].

13. Tote Tray shall be tan, high impact resistant polystyrene, with label holder permanently attached to face of tray. Supported by individual polycarbonate channels mounted to cabinet ends and partitions with two integral 5mm diameter pins and secured with one- euro style screw. Height adjustable on 32mm (1-1/4") centers.

14. Countertop Supports:

- a. Powder coated, formed metal supports. Must provide attachment points between countertop and wall.

2.5 FINISHES

A. Plastic Laminate Casework Colors:

1. High Pressure Laminate is available in non-premium, non-specialty and manufacturers' standard suede finishes from our select laminate manufacturers, including:
 - a. [Standard: Wilsonart® in a "60" or "38" matte finish] and [Standard: Nevamar® in a "T" textured finish] and [Standard: Formica in a "58" finish] and [Standard: Pionite in an "SD" finish].
 - b. Color: Specialty and other manufacturer finishes are available with additional cost and longer lead times.

2. Thermally Fused Melamine Laminate that meets performance requirements of ANSI/NEMA 3 LD – 2005 for GP-28.
 - a. [Standard: Light Beige (Tango D30)] or [Standard: Fashion Grey (Tango D381)] or [Standard: Frosty White (Tango 1573)]
 3. Thermally Fused Melamine Decorative Laminate available, but will result in additional cost when used for casework.
 - a. [TrytoSavatre (Tango WC105 Timberline)] or [Afternoon Nap (Tango WA120 Wood Essence)] or [Wedding Cake (Tango WT790 Wood Essence)] or [Tranquility (Tango WA 3000 Wood Essence)] or [Bailey (Tango FB2030 Wood Essence)] or
 - b. [Negotiating in Geneva (Tango PFA60 Metallic Luster)] or [Second Light (Tango HP302 Wood Essence)] or [Macchiato (Tango HP689 Wood Essence)] or
 - c. [Stout Walnut (Tango WW3100 Wood Essence)] or [Antoccino (Tango WK0022 Wood Essence)] or [Untold Journey (Tango WW4400 Wood Essence)] or [Bankers Gray (Tango SG214 Satin)] or
 - d. [Pralines & Cream (Tango WW160 Timberline)] or
 - e. [Kona Blend Tango WZ0028 Timberline] [Sunset Tango HP336 Wood Essence]
 - f. [Backwoods Sycamore Tango HP689 Wood Essence] [Antochino Tango WK0022 Wood Essence] [Sunbeam Tango WW9000 Wood Essence]
 - g. [Little Black Dress Tango AE100 Metallic Luster] [Black Tango 1595 Satin]
 - h. [Light Beige Tango D30 Satin] [Frosty White Tango 1573 Satin]
 - i. [Black (1595 Wood Essence)]
 4. Cabinet Liner .020" thick, high-pressure cabinet liner conforming to ANSI/NEMA 3 LD
 - a. 2005, Grade CLS. Surface texture shall be similar to exterior finish. Color shall match interior.
 - b. [Standard: Light Beige] or [Standard: Fashion Grey] or [Standard: Frosty White].
- B. Music Shelves:
1. Heavy-Duty Shelves:
 - a. [Select an edge from our 52 standard colors].
 2. Thermoplastic Shelves:
 - a. Select a top surface standard color [Grey] or [White] or [Light Beige].
 - b. [Select an edge from our 52 standard colors].
 3. Caseliner Shelves:
 - a. Charcoal grey
- C. Decorative laminate Library furniture shall feature:
1. Finish of surfaces standard in:
 - i. [TrytoSavatre (Tango WC105 Timberline)] or [Afternoon Nap (Tango WA120 Wood Essence)] or [Wedding Cake (Tango WT790 Wood Essence)] or [Tranquility (Tango WA 3000 Wood Essence)] or [Bailey (Tango FB2030 Wood Essence)] or
 - ii. [Negotiating in Geneva (Tango PFA60 Metallic Luster)] or [Second Light (Tango HP302 Wood Essence)] or [Macchiato (Tango HP689 Wood Essence)] or
 - iii. [Stout Walnut (Tango WW3100 Wood Essence)] or [Antoccino (Tango WK0022 Wood Essence)] or [Untold Journey (Tango WW4400 Wood Essence)] or [Bankers Gray (Tango SG214 Satin)] or

- iv. [Pralines & Cream (Tango WW160 Timberline)] or [Kona Blend Tango WZ0028 Timberline]
- v. [Sunset Tango HP336 Wood Essence]
- vi. [Backwoods Sycamore Tango HP689 Wood Essence] [Antochino Tango WK0022 Wood Essence] [Sunbeam Tango WW9000 Wood Essence]
- vii. [Little Black Dress Tango AE100 Metallic Luster] [Black Tango 1595 Satin]
- viii. [Light Beige Tango D30 Satin] [Frosty White Tango 1573 Satin] [Black (1595 Wood Essence)]

2. Edges:

- a. [Select color from 20 Tango standard color options].

D. Plastic Laminate Countertop Colors:

- a. [Standard: Wilsonart® in a "60" matte finish] or [Standard: Nevamar® in a "T" textured finish] or [Standard: Formica in a "58" finish] or [Standard: Pionite in an "SD" finish].
- b. Color: Specialty and other manufacturer finishes are available with additional cost and longer lead times.

E. Epoxy Resin Countertops shall be: [Standard: Black].

F. Phenolic Resin Countertop shall be: [Standard: Black].

G. Accessories:

1. Fixtures

- a. All laboratory service fixtures (except fitting inside fume hoods) and safety equipment shall be:
 - i. Colored epoxy finish: fixtures shall be furnished with epoxy/polyester hybrid powder coated finish in [White] or [Tan] or [Gray].
 - ii. Polished chrome plated with clear epoxy coating: fixtures shall be furnished with a polished chrome plated finish with clear epoxy coating.
 - iii. Satin Chrome Plated with Clear epoxy coating: fixtures shall be furnished with a satin chrome plated finish with clear epoxy coating.

2. Hinges:

- a. 5-Knuckle Hinge / Reveal Overlay: Three finishes are available as standard in epoxy powder coat: [Black] or [Almond] or [Platinum] and at an additional charge for [Brushed Chrome] or [Stainless].
- b. Inset 5-Knuckle Hinge: Three finishes are available as standard in: [Black] or
- c. [Almond] or [Platinum].
- d. 3-Knuckle Hinge shall be nickel-plated.
- e. Concealed Hinge shall be nickel-plated.

3. Pulls:

- a. [Aluminum Wire]
- b. [96mm Stainless Steel]
- c. Brass Core Wire Pull shall be available as standard in: [Dull Chrome] or [Polished Chrome] or [Dull Brass] or [Polished Brass].
- d. Plastic Contour Pulls shall be available as standard in: [Almond] or [Greystone] or [Black].

- e. Epoxy Coated Wire Pulls shall be available as standard in: [Almond] or [Platinum] or [Black].
- f. ABS Semi Recessed Pulls shall be available as standard in: [Black] or [Almond] or [Greystone].
- g. Semi Recessed, Oversized Pulls shall be available as standard in: [Black] or [Almond] or [Grey].
- h. [Custom Pull: Must Specify Brand and Model Number].
- H. Glazed Door Trim shall be one of our standard colors: [Black] or [White] or [Almond] or [Grey].
- I. Countertop Supports shall be in one of our standard colors: [Light Grey] or [Light Neutral] or [Black] or [White].
- J. Round Grommet shall be in one of our standard colors: [Black] or [Almond] or [Grey] or [White].
- K. Round Grommets shall be in one of our standard colors: [Black] or [Almond] or [Grey] or [White].

PART 3 – EXECUTION

3.1 INSTALLERS

- A. Installation shall be: by casework manufacturer's authorized representative.

3.2 INSTALLATION

- A. Casework shall not be installed until concrete, masonry, and drywall/plaster work is dry.
- B. Casework shall be installed plumb and true and is to be securely anchored in place.
- C. The casework contractor shall verify all critical building dimensions prior to fabrication of casework.
- D. Provide all labor for unloading, distribution, and installation of casework and related items as specified.
- E. All casework shall be: securely anchored to horizontal wall blocking, not to plaster lathe or wall board.
- F. The casework manufacturer shall re-configure the casework arrangements to dimensions requiring 2-1/2" or less of filler at each end of wall-to-wall elevations, and to ensure a complete and satisfactory installation.
- G. The casework installer shall remove all debris, sawdust, scraps, and leave casework spaces clean.
- H. All casework must be installed by casework installer plumb and level, adjust all doors, drawers and hardware to comply with manufacturers specifications and operate properly.

END OF SECTION

SECTION 13120 - PRE-ENGINEERED BUILDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions and Division 1 Specifications sections apply to work specified in this Section.

1.2 SUMMARY

- A. Extent of pre-engineered buildings work is shown on drawings.
- B. Building Type: The pre-engineered building system shown is a single story, rigid frame type metal building of the nominal length, width, eave height and roof pitch indicated.
 - 1. Manufacturer's standard components may be used, providing components, accessories, and complete structure conform to architectural design appearance shown and to specified requirements.
 - 2. Concrete floor and foundations and installation of anchor bolts are specified in a Division 3 section. Provide anchor bolts (including sizes and lengths) and anchor bolt plan to Contractor for work by others.
 - 3. Sealants and caulking are specified in Division 7 section.
 - 4. Blanket Insulation under roof and inside walls as indicated on drawings and specified in this section.
 - 5. Prefinished Metal Roof Panels as indicated on drawings and specified in this section.
 - 6. Interior and Exterior Wall Panels as indicated on drawings and specified in this section.
 - 7. Provide prefinished fascia, vented/non-vented soffit systems, flashing, drip edge, trim, gutters and downspouts as indicated on drawings and specified in Section 07600, Flashing and Sheet Metal.

1.3 DESCRIPTION

- A. Provide all materials, labor, equipment and services, and perform all operations in connection with the furnishing and installing of pre-engineered building, in accordance with the drawings and specifications, including, but not limited to, the following:
 - 1. Metal Framing Components
 - 2. Metal Building Accessories
 - 3. Preformed Metal Roofing
 - 4. Metal Wall Panels
 - 5. Roof & Wall Insulation
 - 6. Flashing, Gutters and Downspouts
 - 7. Workmanship
 - 8. Inspection of Surfaces
 - 9. Protection
 - 10. Delivery, Samples and Shop Drawings
 - 11. Guarantee and Warranty

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1.4 SUBMITTALS

- A. Any deviation (deletions, additions or revisions thereof) 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 in 'RED' and, in a letter transmitting the Submittal to the Architect, the Supplier and Contractor shall direct the Architect's attention to, and request specific approval of, the **specific** deviations. Otherwise, the Architect's approval of a Submittal does not constitute approval of any deviation from the requirements of the Contract Documents contained in the Submittal. Should any deviation be found at a later date, the Supplier and Contractor shall bear the responsibility and cost of all corrections required.
- B. Product Data: Submit manufacturer's product information, specifications and installation instructions for building components and accessories. Submit sample warranty.
- C. Shop Drawings: Submit complete erection drawings showing anchor bolts settings, sidewall, endwall, and roof framing, transverse cross sections, covering and trim details, and accessory installation details to clearly indicate proper assembly of building components.
1. The shop drawings **MUST** be submitted as an "overlay" drawing to the Architectural drawings.
 2. The Contractor/supplier **MUST** provide the "overlay" drawings **including** the Architectural drawings in the complete submittal.
 3. The "overlay" drawings must be submitted in 'RED' with the Architectural drawings in 'BLACK'.
- D. Samples: The contractor shall submit samples for review as required thru-out this specification section. Samples will be used to evaluate the quality of the finished product/system.
- E. Certification: Submit written Certification and all structural calculations prepared and signed by a Professional Engineer, registered to practice in the State where building is to be erected, verifying that building design meets indicated loading requirements and codes of authorities having jurisdiction. Calculations shall clearly show all loads used for the design of each member. All column reactions at the foundation shall be provided for verification of the foundation design.

1.5 QUALITY ASSURANCE

- A. Design Criteria:
1. All items below shall be designed within the architectural design furring spaces. Refer to submittal requirements above for deviations made from the requirements of the Contract Documents.
 2. Structural Framing: Design primary and secondary structural members and exterior covering materials for applicable loads and combinations of loads in accordance with the Metal Building Manufacturers Association's (MBMA) "Design Practices Manual".
 3. Structural Steel: For design of structural steel members, comply with requirements of the American Institute of Steel Construction's (AISC) "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" for design requirements and allowable stresses.
 4. Light Gage Steel: For design of light gage steel members, comply with requirements of the American Iron and Steel Institute's (AISI) "Specification for the Design of Cold Formed Steel Structural Members" and "Design of Light Gage Steel Diaphragms" for design requirements and allowable stresses.

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5. Welded Connections: Comply with requirements of the American Welding Society's (AWS) "Standard Code for Arc and Gas Welding in Building Construction" for welding procedures.
 6. Impact Resistance: Roof coverings installed on low-slope roofs (roof slope $<2:12$) shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the "Resistance to Foot Traffic Test" FM 4470.
- B. Design Loads: Building shall meet all applicable Codes.
1. Basic design loads include live load, wind load and up-lift, in addition to the dead load. Minimum acceptable design loads and deflection criteria are shown on the drawings.
 2. Design each member to withstand stresses resulting from combinations of loads that produce the maximum allowable stresses in that member as prescribed in MBMA's "Design Practices Manual".
- C. Manufacturer's Qualifications: Provide pre-engineered metal buildings as produced by a manufacturer with not less than 5 years successful experience in the fabrication of pre-engineered metal buildings of the type and quality required. Manufacturer will be a member of the MBMA.
- D. Erector's Qualifications: Pre-engineered building shall be erected by a firm that has not less than 5 years successful experience in the erection of pre-engineered buildings similar to those required for this project, and that has been licensed by the manufacturer of the building system.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store prefabricated components, sheets, panels and other manufactured items so they will not be damaged or deformed.
- B. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight ventilated covering. Store metal sheets or panels so that water accumulations will drain freely. Do not store sheets or panels in contact with other materials which might cause staining.

1.7 WARRANTIES

- A. The Contractor Must provide ALL Warranties as indicated thru-out this specification section.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 1. ACI Building Systems
 2. American Buildings Company
 3. Bigbee Steel Buildings, Inc.
 4. Butler Buildings Company
 5. Ceko Building Systems
 6. Nucor Building Systems
 7. Varco-Pruden Building System
 8. Whirlwind Steel
 9. Ascent Buildings

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2.2 MATERIALS

- A. Hot-Rolled Structural Shapes: Comply with requirements of ASTM A36 or A529.
- B. Tubing or Pipe: Comply with requirements of ASTM A500, Grade B, ASTM A501, or A53.
- C. Members Fabricated from Plate or Bar Stock: Provide 42,000 psi minimum yield strength. Comply with requirements of ASTM A529, A570 or A572.
- D. Members Fabricated by Cold Forming: Comply with requirements of ASTM A607, Grade 50.
- E. Bolts for Structural Framing: Comply with requirements of ASTM A307 or A325 as necessary for design loads and connection details.

2.3 PRIMARY FRAMING

- A. Rigid Frames shall be fabricated from hot-rolled structural steel. Provide built-up "I-beam" shape rigid frames consisting of either tapered or parallel flange beams and straight columns. Provide frames factory welded and shop painted. Furnish frames complete with attachment plates, bearing plates and splice members. Factory drill frames for bolted field assembly.
 - 1. Provide length of span and spacing of frames indicated. Slight variations in length of span and frame spacing may be acceptable if necessary to meet manufacturer's standard, and if approved by the Architect.
 - 2. Provide rigid frames at endwalls where indicated.
- B. End Wall Columns: Provide factory welded, shop painted endwall columns built-up "I" shape welded plate.
- C. Wind Bracing: Provide horizontal and adjustable wind bracing at roof only using diagonal cables or threaded steel rods; comply with requirements of ASTM A36 or A572, Grade D.

2.4 SECONDARY FRAMING

- A. The spacing of all purlins as shown on the drawings is diagrammatic, therefore, the Registered Professional Engineer for the Pre-Engineered Building shall be responsible for the design of the roof structure to support the framing to meet all state, federal and local code restrictions and structural requirements set forth by the structural engineer. It shall be the responsibility of the Pre-Engineered Building manufacture to coordinate with the Bidding Contractor the amount of erection required for the roof framing before bidding.
- B. Provide not less than 16-ga. shop painted rolled formed sections for the following secondary framing members unless shown otherwise on structural contract drawings.
 - 1. Purlins.
 - 2. Eave struts.
 - 3. Endwall rafters.
 - 4. Flange bracing.
 - 5. Sag bracing.
- C. Provide not less than 14-ga. cold-formed galvanized steel sections for the following secondary framing members:
 - 1. Base channels.
 - 2. Sill angles.
 - 3. Endwall structural members (except columns and beams).

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4. Purlin spacers.
- D. Bolts: Provide ASTM A307 bolts, at secondary structural connections. Provide zinc-plated or cadmium-plated bolts when structural framing components are in direct contact with roofing and siding panels. Primary structural connections to be made with ASTM A325 bolts.
- E. Shop Painting: Clean surfaces to be primed of loose mill scale, rust, dirt, oil, grease, and other matter precluding paint bond. Follow procedures of SSPC-SP3 for power tool cleaning, SSPC-SP7 for brush-off blast cleaning, and SSPC-SPI for solvent cleaning.
 1. Prime structural steel primary and secondary framing members. See Structural Steel 05500 page 3 - Structural Steel Prime Paint and page 5 - Shop Painting.
 2. Prime galvanized members, after phosphoric acid pretreatment with manufacturer's standard zinc dust-zinc oxide primer.

2.5 PREFORMED METAL ROOFING

A. Description of Work

1. The work under this section consists of all preformed metal roofing, underlayment, ridge vent system, sheet metal, roof drainage accessories and all related items necessary to complete the roofing system work indicated on the drawings and herein specified including but not limited to the following:
 - a. Formed Roof Panels for Standing Seam Installation
 - b. Workmanship
 - c. Inspection of Surfaces
 - d. Protection
 - e. Delivery, Samples and Shop Drawings

B. Quality Assurance

1. The Contractor shall engage the services of a Professional Roof Consultant. The Consultant must hold a minimum title of Registered Roof Observer (RRO) through the International Institute of Building Enclosure Consultants (IIBEC) and provide evidence of adequate insurance as required below. The Consultant should perform three (3) inspections during the installation of each new roof system type (1 – Start up inspection; 2 – Interim inspection; 3 – Final inspection). The Consultant must document all site visits with photographs and written reports. All reports shall be forwarded to the Architect with documentation of the roofing progress and any deficiencies noted during the inspections. Upon completion of all punch list items, the Consultant should provide a letter of roof completion advising the new roof systems meet and/or exceed the project requirements. ***(Note: Although the contractor will be paying the roof consultant from their proceeds, the roof consultant will be considered an agent of the owner and architect throughout the project and will perform the required inspections on behalf of the owner and architect. The above specification shall be applied to individual facilities when multiple site locations are included in the project.)***
 - a. Roof Consultant Insurance Requirements:
 - i. Gen. Liability - \$1,000,000 each occurrence - \$2,000,000 General Aggregate / Auto. Liability - \$1,000,000 / Umbrella Liability. - \$1,000,000 / Workers Compensation - \$1,000,000 per statute / Professional Liability - \$1,000,000
 - b. Approved Roof Consulting Firm:

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- i. Roof Asset Management, Inc. | David Lee, RRO, CIT, FAA-107 | 4950 Woodfield Drive, Millbrook, Alabama 36054 | (334) 590-7999.
 - ii. Substitutions: Roof consulting firms must be pre-approved by the Architect. Requests for a substituting firm must be submitted "In writing" 10 (Ten) days prior to the bid opening.
 2. Performance Test Standards: Provide preformed panel systems which have been pretested and certified by manufacturer to provide specified resistance to air and water infiltration and structural deflection and failure when installed as indicated and when tested in accordance with AAMA 501, "Methods of Test for Metal Curtain Walls".
 3. Field Measurements: Where possible, prior to fabrication of prefabricated panels, take field measurements of structure or substrates to receive panel system. Allow for trimming panel units where final dimensions cannot be established prior to fabrication.
 4. Impact Resistance: Roof coverings installed on low-slope roofs (roof slope <2:12) shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the "Resistance to Foot Traffic Test" FM 4470.
 5. Compatibility: Provide products which are recommended by manufacturers to be fully compatible with indicated substrates or provide separation materials as required to eliminate contact between incompatible materials.
- C. Submittals
1. Product Data: Submit manufacturer's product specifications, standard details, certified product test results, installation instructions and general recommendations, as applicable to materials and finishes for each component and for total system of preformed panels.
 2. Samples: Submit 2 samples 12" square, of each exposed finish material.
 3. Shop Drawings: Submit small-scale layouts of panels on roofs, and large-scale details of edge conditions, joints, corners, custom profiles, supports, anchorages, trim, flashings, closures, and special details. Distinguish between factory and field assembly work.
- D. Roofer's Qualifications
1. Installation of the metal roofing and roof related accessories shall be performed by **Certified / Preferred Roofers** authorized by the manufacturer as trained and qualified to erect the manufacturer's product.
 2. The Contractor shall submit a letter from the manufacturer of the metal roofing system, certifying the date of certification from the Manufacturer and the dates and year the Roofing Contractor attended school, prior to full certification that this Roofing Contractor is a certified roofer.
- E. Roofing Warranties and Guarantee
1. Weather Tightness Warranty
 - a. The entire installation (sub-framing, clips, panels, fasteners, rakes, eave, ridge, valley flashing conditions, roof to wall conditions as-well-as all materials specified as supplied by the manufacturer) shall be guaranteed weather tight for a minimum of **Twenty (20) years (NO Dollar Limit NDL)**. Provide written warranty, signed by metal roofing manufacturer and his authorized installer, agreeing to replace/repair defective materials and workmanship during the warranty period, certified by the third-party inspection firm as stated under QUALITY ASSURANCE. This warranty shall be identified as neither Non-Depreciating, Non-Pro-Rated, nor have exclusions that identify, valleys, curbs, and

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flashings. The warranty shall be signed by the Manufacturer of the roofing materials and the authorized installer.

2. Manufacturer's Warranty

- a. **Manufacturer's roofing warranties which contain language regarding the governing of the warranty by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such warranties.**
- b. Roof Panels: Durability of the metallic coated and unpainted roof panels due to rupture, structural failure or perforation shall be warranted for a period of **Twenty (20) years** by the manufacturer.
- c. Color Finish:
 - i. The exterior color finish for painted panels shall be warranted by the Manufacturer for **Twenty-five (25) years** against blistering, peeling, cracking, flaking, chalking and shipping.
 - ii. Excessive color change and chalking shall be warranted for **Twenty-five (25) years**.
 - 1) Color change shall not exceed 5 NBS units per ASTM D2244.68T, chalking shall not be less than a rating of 6 (white) or 8 (other colors) per ASTM D-659.
- d. The roofing manufacture shall be required to provide documentation certifying that the roof design provided complies with the performance requirements as set forth in IBC Chapter 15, Section 1504. The documentation shall be attached to the roof warranty at the close out of the project.

3. Contractor's Roofing Guarantee

- a. Contractor shall furnish Contractors 5 Year Alabama Division of Construction Management Roofing Guarantee. This roofing guarantee is included in the front end documentation of this project manual.
4. All roof warranties/guarantees shall be provided to the Owner, by the Contractor at the Final Inspection to obtain the Substantial Completion.

F. Materials

1. All materials shall be from a single source.
2. **Standing Seam II** with Kynar 500 Finish by American Buildings Company/A Nucor Company.
 - a. Standing seam roof panel shall have a configuration consisting of 2 inch high vertical rib spaced on 16 inch centers. The panel shall have flush horizontal and vertical surfaces to facilitate sealing at terminations. Panel configurations which create voids requiring supple metal closure devices shall not be considered acceptable. Panels shall be joined at the sidelap with an interlocking seam mechanically locked by a seaming machine after installation. The female panel seam shall have a factory applied sealant, in compliance with UL90.
 - b. The panel shall be **24 gauge (minimum)** commercially pure aluminum coated steel meeting military specification MIL-C-4174A Type II, Galvalume or G90 galvanized. Minimum yield strength shall be 80,000 PSI.
 - c. Deviations in appearance from the quality standard manufacturer's panel must be

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approved by the owner before acceptance.

- d. Changes in framing or variations in loading to the existing structure caused by alternate roof systems shall be subject to review and all costs for any modifications shall be the responsibility of the General Contractor.
- e. System Description: The roof system is a concealed fastener interlocking standing seam system. ***Panel must not be roll formed on site, nor use a portable roll former whereby the contractor manufactures the panel versus a single sourced manufacturer providing the finished materials with a single sourced warranty.***
- f. Roof panels shall be standing seam interlocking design and secured to the supports with a concealed structural fastening system. UL certification must appear on the panel if so requested.
- g. The concealed attachment system shall eliminate all through penetration of the exposed roofing surface into structural supports and allow the roof covering to move independently of any differential thermal movement by the framing system.
- h. The panel to structural clip shall be designed to provide +/- one inch of thermal movement. It shall incorporate a self centered feature to assure one inch of movement in both directions.
- i. The standing seam shall have integral male and female interlocking ribs with a factory applied, non-hardening sealant, and the seams shall be continuously locked or crimped together by mechanical means during installation.
- j. Roof panels shall be fastened to the support framing members with a concealed clip or backing device of steel having a protective metallic coating. Through penetration of the roofing surface by exposed fasteners shall occur only for non-structural connection at panel termination and roof perimeter flashing location.
- k. Panel termination and perimeter flashing (attached to roof panels) shall be sealed with sealants recommended by the manufacturer.
- l. Required closures shall be metal. Non-metal closures shall not be acceptable.
- m. Provide thermal blocks at all roof to purlin connection points/deck supports.

G. Metal Finishes

- 1. General: Apply coating either before or after forming and fabricating panels, as required by coating process and as required for maximum coating performance capability. Protect coating promptly after application and cure, by application of strippable film or removable adhesive cover and retain until installation has been completed.
- 2. Color Finish on Roof Panels and Trim: *(Applies to Metal Wall Panels, Flashings, Facia, Metal Building Accessories, Gutters and Downspouts)*
 - a. Panels shall have a factory color finish on the exposed side. The exposed finish shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning.
 - b. Color of the exterior roof panels and trim shall be selected from manufactures standard color pallet After Bid Date.

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- c. The exterior color finish shall meet or exceed the performance requirements specified below.
 - i. Paint Color Test:
 - 1) Test: Film Thickness; Test Method: ASTM D-1005; Performance: 0.2 mil primer 0.8-0.9 mil topcoat
 - 2) Test: 60° @ under 10 low gloss; Test Method: ASTM D-523; Performance: 25-35
 - 3) Test: IR Reflectivity; Test Method: ASTM D-4803-97; Performance: Must meet 25% Minimum (exceeds)
 - 4) Test: Pencil Hardness; Test Method: ASTM D-3363; Performance: HB-H
 - 5) Test: Flexibility, T-Bend; Test Method: ASTM D-4145; Performance: 2-T Galvalume Steel
 - 6) Test: Adhesion; Test Method: ASTM D-3359; Performance: No adhesion Loss
 - 7) Test: Reverse Impact; Test Method: ASTM D-2794; Performance: No cracking or loss of adhesion
 - 8) Test: Abrasion, Falling Sand; Test Method: ASTM D-968; Performance: 65-85 1/mil
 - 9) Test: Mortar Resistance; Test Method: ASTM C-267; Performance: No effect
 - 10) Test: Detergent Resistance; Test Method: ASTM D-2248 3% 72 hrs. @ 100°F; Performance: No effect
 - 11) Test: Acid Pollutants; Test Method: ASTM D-1308 10% Muriatic Acid (15 min) 20% Muriatic Acid (15 min); Performance: No effect, AAMA 605.2 <5units color change
 - 12) Test: Acid Rain Test; Test Method: Kesternich; Performance: 15 cycles minimum, no objectionable color change
 - 13) Test: Alkali Resistance; Test Method: 20% Sodium Hydroxide (1hr); Performance: No effect
 - 14) Test: Salt Spray Resistance 5% @ 95° F; Test Method: ASTM B-117; Performance: 1000 hrs Galvalume steel
 - 15) Test: Humidity Resistance 100% @ 100° F; Test Method: ASTM D-2247; Performance: Passes 1000 hrs Galvalume Steel
 - 16) Test: South Florida exposure; Test Method: ASTM D-2244; Performance: <5 units color change
 - 17) Test: UVB (313 bulbs); Test Method: ASTM G-53; Performance: Passes 3000 hrs
 - 18) Test: Chalk Resistance; Test Method: ASTM D-4214; Performance: Rating of 8 min
- 1. Colors must meet the following: The solar reflectance for a steep-sloped roof must be a minimum of 25%, dropping no less than to 15% after three years. Low sloped roofs (below 2:12) must be a minimum of 65% dropping to no less than 50% after three years.

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H. Roof Panels

1. General: Provide roofing sheets formed to the general profile or configuration indicated. All roof panels shall be full length, no end laps allowed.
2. Zinc-Coated Steel Sheets: Provide structural quality hot-dip galvanized steel sheets, complying with requirements of ASTM A446, Grade C, with G90 coating complying with ASTM A525.
3. Aluminum Coated Steel Sheets: Provide drawing quality aluminum coated steel sheets, complying with requirements of ASTM A463, with T1-40 coating.
 - a. Metal thickness not less than 24 ga. (0.0179").
4. Accessories: Provide the following sheet metal accessories factory formed of the same material and finish as the roofing and siding.
 - a. Flashings.
 - b. Fillers.
 - c. Metal expansion joints.
 - d. Facias
 - e. Ridge covers.
 - f. Cover exposed structural and secondary members at exterior.
5. Fasteners:
 - a. Provide self-tapping screws, bolts, nuts, self-locking rivets, self-locking bolts, end welded studs, and other suitable fasteners as standard with the manufacturer designed to withstand design loads.
 - b. Provide metal-backed neoprene washers under heads of fasteners bearing on weather side of panels.
 - c. Use stainless steel fasteners for exterior application and galvanized or cadmium plated fasteners for interior applications.
 - d. Locate and space fastenings in true vertical and horizontal alignment. Use proper type fastening tools to obtain controlled uniform compression for positive seal without rupture of neoprene washer.
 - e. Provide fasteners with heads matching color of roofing sheets by means of plastic caps or factory-applied coating.
6. Flexible Closure Strips: Provide closed-cell, expanded cellular rubber, self-extinguishing flexible closure strips. Cut or premold closure strips to match corrugation configuration of roofing and siding sheets. Provide closure strips where indicated or necessary to ensure weathertight construction.
7. Sealing Tape: Provide pressure sensitive 100 percent solids isobutylene tripolymer compound sealing tape with release paper backing. Provide permanently elastic, non-sag, non-toxic, non-staining tape not less than 1/2" wide and 1/8" thick.
8. Joint Sealants: Provide one-part elastomeric polyurethane polysulfide or silicone rubber sealant as recommended by the building manufacturer.

I. Miscellaneous Materials

1. Internal Panel Framing: Manufacturer's standard.

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2. Fasteners: Manufacturer's standard noncorrosive types, with exterior heads gasketed.
3. Accessories: Except as indicated as work of another specification section, provide components required for a complete roofing/siding system, including:
 - a. Trim, Copings, Fascias, Gravel stops, Mullions, Sills, Corner Units, Ridge Closures, Clips, Seam Covers, Battens, Flashings, Gutters, Downspouts, Louvers, Sealants, Gaskets, Fillers, Closure Strips, All similar items.
 - i. Match materials/finishes of preformed panels.
4. Bituminous Coating: Cold-applied asphalt mastic, SSPC paint 12, compounded for 15 mil dry film thickness per coat.

J. PRE-ROOFING CONFERENCE

1. A pre-roofing conference is required before any roofing materials are installed. This conference shall be conducted by a representative of the Architect and attended by representatives of the Owner, Division of Construction Management Inspector, General Contractor, Roofing Contractor, Sheet Metal Contractor, Roof Deck Manufacturer (if applicable), and the Roofing Materials Manufacturer (if warranty is required of this manufacturer). If equipment of substantial size is to be placed on the roof, the Mechanical Contractor must also attend this meeting. Provide at least 72 hours advance notice to participants prior to convening pre-roofing conference.
2. The pre-roofing conference is intended to clarify demolition and application requirements for work to be completed before roofing operations can begin. This would include a detailed review of the specifications, roof plans, roof deck information, flashing details, and approved shop drawings, submittal data, and samples. If conflict exists between the specifications and the Manufacturer's requirements, this shall be resolved. If this pre-roofing conference cannot be satisfactorily concluded without further inspection and investigation by any of the parties present, it shall be reconvened at the earliest possible time to avoid delay of the work. In no case should the work proceed without inspection of all roof deck areas and substantial agreement on all points.
3. The following are to be accomplished during the conference:
 - a. To review all Factory Mutual and Underwriters Laboratories requirements listed in the specifications and resolve any questions or conflicts that may arise.
 - b. To establish trade-related job schedules, including the installation of roof-mounted mechanical equipment.
 - c. To establish roofing schedule and work methods that will prevent roof damage.
 - d. Require that all roof penetrations and walls be in place prior to installing the roof.
 - e. To establish those areas on the job site that will be designated as work and storage areas for roofing operations.
 - f. To establish weather and working temperature conditions to which all parties must agree.
 - g. To establish acceptable methods of protecting the finished roof if any trades must travel across or work on or above any areas of the finished roof.
4. The Architect shall prepare a written report indicating actions taken and decisions made at this pre-roofing conference. This report shall be made a part of the project record and copies furnished the General Contractor, the Owner, the Division of Construction Management, and the Division of Construction Management Inspector.

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K. Installation

1. General: Comply with panel fabricator's and material manufacturer's instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal/structural movement.
 - a. Install panels with concealed fasteners.
2. Installation Tolerances: Shim and align panel units within installed tolerance of 1/4" in 20'-0" on level/plumb/slope and location/line as indicated, and within 1/8" offset of adjoining faces and of alignment of matching profiles.
3. Joint Sealers: Install gaskets, joint fillers and sealants where indicated and where required for weatherproof performance of panel systems. Provide types of gaskets and sealants/fillers indicated or, if not otherwise indicated, types recommended by panel manufacturer.
4. Refer to other sections of these specifications for product and installation requirements applicable to indicated joint sealers.
5. Water shall be prevented from entering the building during the work. This shall involve keeping penetrations sealed, planning the work to reroof sections and sealing new to old or other precautionary and effective safeguards.

2.6 METAL WALL PANELS

A. Description of Work

1. Extent of each type of preformed wall panels/siding is indicated on the drawings and by provisions of this section. Preformed wall panels/siding is hereby defined to include panels which are structurally capable of spanning between supports spaced as indicated.
2. Types of materials required include the following:
 - a. Exterior Wall Panel
 - b. Workmanship
 - c. Inspection of Surfaces
 - d. Protection
 - e. Delivery, Samples and Shop Drawings

B. Quality Assurance

1. Performance Test Standards: Provide preformed panel systems which have been pretested and certified by manufacturer to provide specified resistance to air and water infiltration and structural deflection and failure when installed as indicated and when tested in accordance with AAMA 501, "Methods of Test for Metal Curtain Walls".
2. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum of five years of experience in manufacture of similar products in successful use in similar applications.
3. Field Measurements: Where possible, prior to fabrication of prefabricated panels, take field measurements of structure or substrates to receive panel system. Allow for trimming panel units where final dimensions cannot be established prior to fabrication.

C. Submittals

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1. Product Data: Submit manufacturer's product specifications, standard details, certified product test results, installation instructions and general recommendations, as applicable to materials and finishes for each component and for total system of preformed panels.
2. Samples: Submit 2 samples 12" square, of each exposed finish material.
3. Shop Drawings: Submit small-scale layouts of panels, and large-scale details of edge conditions, joints, corners, custom profiles, supports, anchorages, trim, flashings, closures, and special details. Distinguish between factory and field assembly work.

D. Materials - EXTERIOR PANELS / INTERIOR PANELS

1. **"Architectural" (Reverse Rib)** Panel by American Buildings Company/A Nucor Company.
 - a. The panel shall have major ribs 1 ¼" high. Spaces 12" on center for an even shadowed appearance. The panels are to be reinforced between the ribs for added strength. Each panel shall provide 36" net coverage in width.
 - b. Panels shall conform to one of the following:
 - I. Panel material as specified shall be 24 gage zinc-coated(galvanized) steel, coating designation G90, conforming to the requirements of ASTM A 653, Grade 80. Minimum yield strength shall be 80,000 psi.
 - c. Fasteners for Wall Panels:
 - I. Shall be manufacturer's fastener with hex washer head, cadmium or zinc plated.
 - II. Shall be assembled with an EPDM washer.
 - III. The fasteners shall be color coordinated with a premium coating system which protects against corrosion and weathering.
 - d. Metal Finishes
 - i. General: Apply coating either before or after forming and fabricating panels, as required by coating process and as required for maximum coating performance capability.
 - ii. Protect coating promptly after application and cure, by application of strippable film or removable adhesive cover, and retain until installation has been completed.
 - iii. Durability: Provide coating which has been field tested under normal range of weathering conditions for minimum of 20 years without significant peel, blister, flake, chip, crack or check in finish, and without chalking in excess of 8 (ASTM D 659), and without fading in excess of 5 NBS units.
 - iv. Color Finish on All Trim and All Wall Panels: Panels shall have a factory color finish on the exposed side. The exposed finish shall consist of a 70% KYNAR 500 resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than 0.8 mil. exclusive of the primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. The color finish shall meet or exceed the performance requirements specified in Section 2.5 paragraph G above.
 - 1) Provide all trims, fasteners, sealants to match selected colors.
 - 2) Color of the panels shall be selected by the Architect from manufactures Standard Color pallet After Bid Date.

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- v. Internal Panel Framing: Manufacturer's standard.
- vi. Fasteners: Manufacturer's standard noncorrosive types, with exterior heads gasketed.

E. Wall Panel Fabrication

1. General: Fabricate and finish panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, and as required to fulfill indicated performance requirements which have been demonstrated by factory testing. Comply with indicated profiles and dimensional requirements, and with structural requirements.
2. Metal Gages: Thicknesses required for structural performances, but not less than manufacturer's recommended minimums for profiles and applications indicated, and not less than 22 gauge.
3. Required Performances: Fabricate panels and other components of wall system for the following installed performances.
4. Water Penetration: No significant, uncontrolled leakage at 4 lbs. per sq. ft. pressure with spray test.
5. Air Infiltration: 0.02 cfm per sq. ft. for gross roof/wall areas, with 4 lbs. per sq. ft. differential pressure.
6. Sound Transmission: STC rating of 28.
7. Sound Absorption, Interior Surfaces: Coefficient of 0.75.
8. Apply bituminous coating or other permanent separation materials on concealed panel surfaces where panels would otherwise be in direct contact with substrate materials which are noncompatible or could result in corrosion or deterioration of either material or finishes.
9. Fabricate panel joints with captive gaskets or separator strips, which provide a tight seal and prevent metal-to-metal contact in a manner which will minimize noise from movements within panel system.
10. Condensation: Fabricate panels for control of condensation, including vapor inclusion of seals and provisions for breathing, venting, weeping and draining.

F. Wall Panel Installation

1. General: Comply with panel fabricator's and material manufacturer's instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal/structural movement.
2. Install panels with concealed fasteners.
3. Installation Tolerances: Shim and align panel units within installed tolerance of 1/4" in 20'-0" on level/plumb/slope and location/line as indicated, and within 1/8" offset of adjoining faces and of alignment of matching profiles.
4. Joint Sealers: Install gaskets, joint fillers and sealants where indicated and where required for weatherproof performance of panel systems. Provide types of gaskets and sealants/fillers indicated or, if not otherwise indicated, types recommended by panel manufacturer.
5. Refer to other sections of these specifications for product and installation requirements applicable to indicated joint sealers.

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6. Joint Sealers: Refer to other sections of these specifications for post-installation requirements on joint sealers; not work of this section.

2.7 FASCIA, SOFFIT, FLASHING, DRIP EDGE, TRIM, GUTTERS AND DOWNSPOUTS

A. Facia, Soffit, Flashings, Drip Edge and Trims

1. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage thick base metal, shop pre-coated with PVDF (Polyvinylidene Fluoride) coating.
2. Finish: The exposed finish on all exposed metals and similar items shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning,
 - a. Colors: As selected by Architect after Bid Date, from manufacturer's standard colors including white.

B. Gutters

1. Gutters: Provide flat shapes, no rolled formed stiffeners or ribbed allowed. Form gutters in "continuous" sections not less than 8 feet in length, complete with end pieces, outlet tubes and other special pieces as may be required. Join sections with riveted and soldered or sealed joints. Provide expansion-type slip joint at center of runs.
 - a. Furnish gutter supports spaced at 36" on center constructed of same metal as gutters.
2. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage thick base metal, shop pre-coated with PVDF (Polyvinylidene Fluoride) coating.
3. Finish: The exposed finish on all exposed metals and similar items shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning,
 - a. Colors: As selected by Architect after Bid Date, from manufacturer's standard colors including white.

C. Downspouts

1. Downspouts: Form downspouts in sections approximately 10 feet long (**no corrugated sections**), complete with elbows and offsets. Join sections with not less than 1-1/2" telescoping joints. Provide fasteners, designed to securely hold downspouts not less than 1" away from walls; locate fasteners at top and bottom and equally spaced at approximately 5 feet on center in between.
2. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage thick base metal, shop pre-coated with PVDF (Polyvinylidene Fluoride) coating.
3. Finish: The exposed finish on all exposed metals and similar items shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning,
 - a. Colors: As selected by Architect after Bid Date, from manufacturer's standard colors including white.

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2.8 METAL BUILDING INSULATION

- A. See Section 07200 – Insulation.
 - 1. Thermal Breaks:
 - a. Provide thermal blocks/breaks at all roof to purlin connections points.
 - b. 1/8 inch (3 mm) thick by 3 inch (76 mm) wide white, closed-cell polyethylene foam with pre-applied adhesive film and peel-off backing.
 - c. Polystyrene Snap-R snap-on thermal blocks.

2.9 FABRICATION

- A. General: Design prefabricated components and necessary field connections required for erection to permit easy assembly and disassembly. Fabricate components in such a manner that once assembled, they may be disassembled, repackaged and reassembled with a minimum amount of labor.
 - 1. Clearly and legibly mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams and instruction manuals.
- B. Structural Framing: Shop fabricate structural framing components to the indicated size and section complete with base plates, bearing plates and other plates required for erection, welded in place. Provide required holes for anchoring or connections either shop drilled or punched to template dimensions.
 - 1. Shop Connections: Provide power riveted, bolted or welded shop connections.
 - 2. Field Connections: Provide bolted field connections.

PART 3 - EXECUTION

3.1 ERECTION

- A. Framing: Erect structural framing true to line, level and plumb, rigid and secure. Level base plates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use a non-shrinking grout to obtain uniform bearing and to maintain a level base line elevation. Moist cure grout for not less than 7 days after placement.
- B. Purlins and Girts: Provide rake or gable purlins with tight fitting closure channels and fascias. Locate and space wall girts to suit door and window arrangements and heights. Secure purlins and girts to structural framing and hold rigidly to a straight line by sag rods.
- C. Bracing: Provide Temporary Cross Bracing as required for full height of bays. Temporary cross bracing shall be removed upon completion of final cross bracing.
- D. Final Cross Bracing shall be as shown and described on the Structural Drawings. The Contractor shall furnish and install cross bracing as directed by the Structural Engineer – no exceptions. Portal frames are not permitted.
- E. Framed Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical or electrical work. Securely attach to building structural frame.

END OF SECTION

Site Improvements and Interior Alterations to
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SECTION 13670 - EXTRUDED ALUMINUM WALKWAY COVER (FLAT CANOPY)

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. **Flat Canopy:** The work covered by this section shall include design, fabrication and installation of a complete Flat Extruded Aluminum Canopy System (roll formed not acceptable) with decking and fascia in accordance with the drawings and this specification. The canopy shall consist of structural aluminum panels bound by a framework of fascia which also acts as a water collecting gutter. All components shall be as required to support design loads in accordance with engineering prints and calculations provided by the manufacturer. Sizes shown on the drawings are for diagrammatical purposes only. Water shall drain from deck into the beams and out at grade level of columns through drain holes.
- B. **Pitched Canopy:** The work covered by this section shall include design, fabrication and installation of a complete Pitched Extruded Aluminum Canopy System (roll formed not acceptable) with welded drain beams, trusses, decking, fascia and roof panels in accordance with the drawings and this specification. All components shall be as required to support design loads in accordance with engineering prints and calculations provided by the manufacturer. Sizes shown on the drawings are for diagrammatical purposes only. Water shall drain from deck into the beams and onto adjacent roofs of flat canopies.
- C. The extent of aluminum walkway covers is shown on the drawings and as specified herein.

1.3 REFERENCES

- A. Aluminum Design Manual 2000, Specifications & Guidelines for Aluminum Structures.
- B. ASCE 7, Minimum Design Loads for Buildings and Other Structures.
- C. American Architectural Manufacturers Association (AAMA)
- D. American Society for Testing and Materials (ASTM)

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product information, specifications and installation instructions for components and accessories.
- B. Shop Drawings: Submit complete erection drawings showing attachment system, column and gutter beam framing, transverse cross sections, covering and trim details, and optional installation details to clearly indicate proper assembly of components, sealed by a State Registered Structural Engineer in the state in which the work is being performed.
- C. Certification: Submit written Certification prepared and signed by a State Registered Structural Engineer verifying that framing design will safely resist wind uplift as computed by ANSI A58.1, IV=150, Exposure C, as well as meet indicated loading requirements of the Standard Building Code, latest edition as referenced in State Requirements for Educational Facilities 1999 and wind loading requirements of ANSI/ASCE 7-98, live and dead loads and other load requirements.

1.5 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the following except as otherwise indicated.
 - 1. International Building Code, latest addition with amendments, if any.
 - AWS (American Welding Society) standards for structural aluminum welding.
- B. Manufacturer: Obtain aluminum covered walkway system from only one (1) manufacturer, although several may be indicated as offering products complying with requirements.

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- C. Installer Qualification: Firm with not less than three (3) years experience in installation of aluminum walkway covers of type, quantity and installation methods similar to work of this section.
- D. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to insure proper fitting of work. However, allow for adjustments within specified tolerations wherever taking of field measurements before fabrication might delay work.
- E. Shop Assembly: Pre-assemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- F. Coordination: Coordinate work of this section with work of other sections which interface with covered walkway system (sidewalks, curbs, building fascias, etc.).

1.6 PERFORMANCE REQUIREMENTS

- A. System Performance: Provide aluminum covered walkway system that has been designed, produced, fabricated and installed to withstand normal temperature changes as well as live loading, dead loading and wind loading in compliance with Standard Building Code requirements for geographic area in which work is located and as follows:
 - 1. Live Load: 30 p.s.f. minimum
 - 2. Structural design for wind forces: Comply with ANSI A58.1-1982
 - 3. Design Wind Velocity: **120.p.h.**
 - 4. Importance Factor: 1.1.
 - 5. Stability Criteria: International Building Code 2015
- C. Sizes shown on drawings are to be considered minimum.
- D. Roof structure shall be capable of sustaining severe icing, hail, hurricane force winds and supporting a concentrated load such as being walked upon.

PART 2 – PRODUCT

2.1 MANUFACTURERS

- A. The following manufacturers products have been used to establish minimum requirements for materials, workmanship, and function:
 - 1. Extruded Aluminum Walkway Cover System.
 - a. Tennessee Valley Metals, Inc. (**Basis of Design and Standard of Quality**) | 190 Industrial Park Road, Oneonta, Alabama 35121 | (205) 274-9500 | www.tvmetals.com.
 - b. Dittmer Architectural Aluminum | 1006 Shepherd Road | Winter Springs, Florida 32708 | (800) 822-1755; (407) 699-1755 | www.dittdeck.com | info@dittdeck.com.
 - c. Superior Mason Products LLC. | 116 Citation Court, Birmingham, Alabama 35209 | (877) 445-1200 | www.superiormetalproducts.com | canopysales@superior-mason.com.
 - d. Mitchell Metals | 1761 McCoba Dr. SE Suite B, Smyrna, Georgia 30080 | (770) 285-5875; | www.mitchellmetals.net | sales@mitchellmetals.net.
 - e. Gulf South Metals | 17869 Samantha Drive, Foley, Alabama 36535 | (251) 943-6443; | www.gulfsouthmetals.com | info@gulfsouthmetals.com.
- B. Equal products of other manufacturers may be used in the work, provided such products have been approved, by the Architect, not less than ten (10) days prior to scheduled bid opening.

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2.2 MATERIALS

- A. General: All aluminum extrusions shall be alloy 6063 heat treated to a T-6 temper.
- B. Columns: Columns shall be radius-cornered tubular extrusion of size shown on drawings with cutout and internal diverter for drainage where indicated. Circular downspout opening in column is not acceptable. Provide a small weep hole at the bottom of all non-draining columns to allow for
 1. Column size shall be 4" x 4" at Flat Canopy.
- C. Beams (when used): Beams shall be tubular extrusions of size and shape shown on drawings (open-top tubular extrusions of size and shape shown on drawings with top edges thickened for strength as necessary).
 1. Beam Size shall be as indicated on drawings.
- D. Deck Construction: Deck shall be manufactured of extruded modules that interlock in a self-flashing manner. Interlocking joints shall be positively fastened at 18" O.C. creating a monolithic structural unit capable of developing the full strength of the sections. The fastenings must have minimum shear strength of 350 pounds each. Deck shall be assembled with sufficient camber to offset dead load deflection.
 1. Deck shall be Extruded Flat Pans only.
- E. Fascia: Fascia shall be manufacturer's standard shape.
 1. Fascia size(s) shall be as indicated on drawings.
- F. Roof Panels For Flat Canopy:
 1. Roof panels shall be as indicated on drawings.
- G. Drainage: Water shall drain internally from deck to fascia to beams (when used) to columns, for discharge out of rain diverters at or below ground level as indicated on architectural drawings.
- H. Flashing: Flashing shall be .032" aluminum (min.). All thru-wall flashing is completed by others.
- I. Arches: Arches for barrel vault protective covers shall be sharp-cornered tubular extrusions of size shown in drawings.
- J. Fasteners:
 1. Deck Screws (rivets not permitted): Type 18-8 non-magnetic stainless steel sealed with a neoprene "O" ring beneath 5/8" outside dimension, conical washer.
 2. Fascia Rivets: Size 3/16" by 1/2" grip range aluminum rivets with aluminum mandrel.
 3. Bolts: All bolts, nuts and washers to be 18-8 non-magnetic stainless steel.
 4. Tek Screws: not permitted

2.3 FINISHES

- A. Standard:
 1. Factory baked enamel finish, AAMA 603.8.
 - a. Color to be selected by Architect after bid date from manufactures standards.
 - b. Standard Color Selection must include "White".

2.4 WARRANTY

- A. Manufacturer shall warrant the entire system against defects in labor and materials for a period of one (1) year commencing on the date of substantial completion as established in Division One of these specifications.
- B. Intention of this warranty is the manufacturer will come onto the jobsite and do all necessary to effect corrections of any deficiencies.

- C. Prima Facie Evidence of defects in labor and material may include but is not limited to, one or more of the following:
 - 1. Moisture leaks
 - 2. Metal failure including excessive deflection
 - 3. Fastener failure
 - 4. Finish failure

2.5 FABRICATION

- A. Comply with indicated profiles, dimensioned requirements and structural requirements.
- B. Use sections true to details with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture, free from defects impairing strength and durability.
- C. All welding to be done by heli-arc process.
- D. Bents shall consist of shop welded one piece units. When size of bents do not permit shipment as a welded unit, concealed mechanical joints may be used.
- E. Mechanical joints shall consist of stainless steel bolts with a minimum of two (2) bolts per fastening. Bolts and nuts shall be installed in a concealed manner utilizing 1/2" thick by 1 1/2" aluminum bolt bars welded to structural members. All such mechanical joints must be detailed on shop drawings showing all locations.
- F. Roof Deck: Flush deck extruded aluminum shapes, interlocking self-flashing sections. Shop fabricate to lengths and panels widths required for field assembly. Depth of sections to comply with structural requirements. Provide shop induced camber in deck units with spans greater than 16'- 0" to offset dead load deflections. Welded dams are to be used at non-draining ends of deck.
- G. Expansion joints, design structure for thermal expansion and contraction. Provide expansion joints as required.
- H. Exposed rivets used to fasten bottom of fascia to deck to have finish to match fascia.
- I. Apply a shop applied dip-coat of clear acrylic enamel to each column end terminating in concrete to insulate from electrolytic reaction. Column ends shall be pierced to "key" grout to bent for maximum uplift protection.

PART 3 - EXECUTION

3.1 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle covered walkway system components as recommended by manufacturer. Handle and store in a manner to avoid deforming members and to avoid excessive stresses.

3.2 EXAMINATION

- A. Examine adjacent work for conditions that would prevent quality installation of system.
- B. Do not proceed until defects are corrected.

3.3 FIELD DIMENSIONS

- A. General contractor shall field confirm all existing locations, dimensions and elevations shown on shop drawings prior to fabrication.

3.4 INSTALLATION

- A. Install roof deck sections, accessories and related flashing in accordance with manufacturer's instructions. Provide roof slope for rain drainage without ponding water. Align and anchor roof deck units to structural support frames.

- B. Assemble all components in a neat, workmanlike manner.

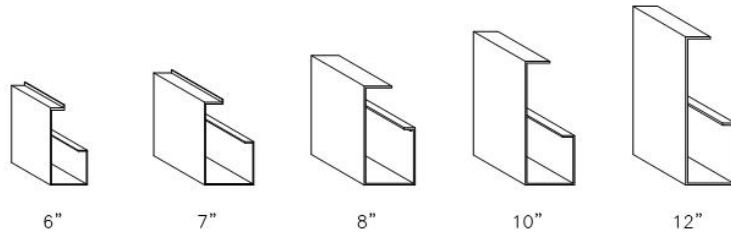
3.5 FLASHING

- A. Flashings: Flashings required between covered walkway system and adjoining structures are not work of this section. Refer to "Flashing and Sheet Metals", Section 07600.

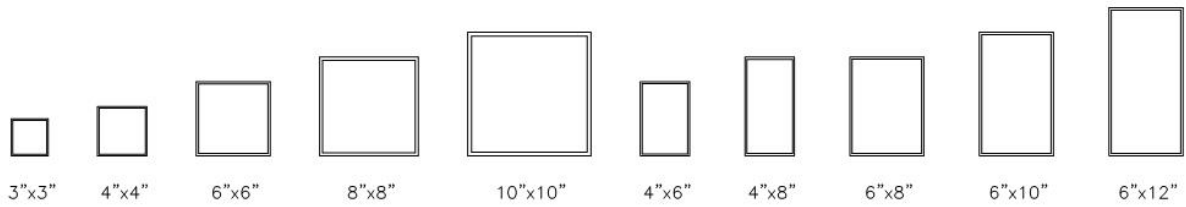
3.6 CLEANING AND PROTECTION

- A. Damaged Units: Replace roof deck panels and other components of the work which have been damaged or have deteriorated beyond successful minor repair.
- B. Cleaning: Remove protective coverings at time in project construction sequence which will afford greatest protection of work. Clean finished surfaces as recommended by manufacturer. Maintain in a clean condition during construction.

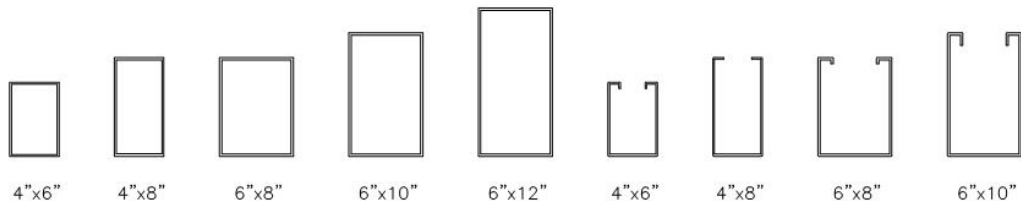
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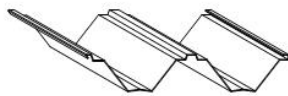
FASCIA OPTIONS



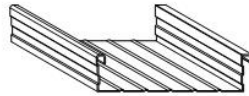
COLUMN OPTIONS



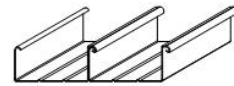
BEAM OPTIONS



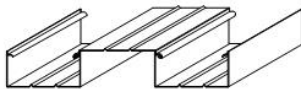
Roll Formed W-pans



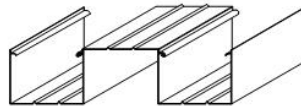
Roll Formed Flat Pans



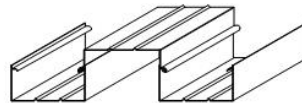
Extruded Flat Pans



3" Extruded Pan & Cap



4½" Extruded Pan & Cap



3" Extruded Pan & 1½" Cap

DECK OPTIONS

MECHANICAL SPECIFICATIONS 15000



SECTION 15100 - GENERAL REQUIREMENTS FOR MECHANICAL WORK

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Scope of Section: Include all materials, equipment, and labor necessary for a complete and properly functioning mechanical installation in accordance with local and state codes, contract drawings and as specified in all 15000 series of these specifications.
- B. Scope of Work: Contractor will be responsible for the demolition and installation of all new work indicated on plans. Coordination shall be required with all existing systems remaining in place as indicated not to be disturbed or reused as a part of the new systems. These systems include plumbing, HVAC, Fire Protection, and controls.

1.2 DRAWINGS

- A. Mechanical drawings are diagrammatic and indicate the general arrangement and extent of work. Exact locations and arrangements of materials and equipment shall be determined as work progresses to conform in the best possible manner with the surroundings and with the adjoining work of other trades.

1.3 COORDINATION OF WORK

- A. Prior to installation, coordinate all work with work of other trades in detail to preclude interferences between the work of different trades and to insure necessary clearances at crossovers and equipment. Work requiring necessarily fixed locations such as graded piping shall take precedence over work not requiring such fixed locations and shall establish permissible routing of services associated with the latter. Should work be performed without adequate coordination so that interferences occur between work of different trades, Contractor shall eliminate such interferences by requiring necessary rework by the trades involved. Such rework shall meet approval of Engineer and shall incur no additional cost to Owner.

1.4 CODES, PERMITS, TAXES

- A. Governing Law: Refer to "General Conditions". Work shall meet requirements of applicable codes, ordinances, rules and regulations, in effect at time of signing contract of any body or bodies having jurisdiction, including utilities.
- B. Correction of Work: Work done contrary to above requirements shall be corrected at no additional cost to Owner.
- C. Permits, Fees, and Taxes: Refer to "General Conditions". Secure and pay for all necessary permits, inspections, licenses, meters, connections, etc., that may be required; pay all required taxes. Owner shall pay any environmental impact fee incurred.

1.5 DISCREPANCIES

- A. In case of differences between drawings and specifications or where drawings and/or specifications are not clear or definite, the subject shall be referred to Engineer for clarification and instructions. Such items should be directed to Engineer prior to taking bids.

1.6 SUBMITTALS

- A. Refer to Section "General Requirements".
- B. Material List: Within thirty (30) days of award of contract submit a complete list of materials to be provided for the mechanical work. List shall include manufacturer's name and catalog number or series for each item on list.
- C. Detail Drawings: Before commencing work, submit other drawings or diagrams, dimensioned and in correct scale, requested by Engineer to clarify the work intended to show its relationship to adjacent work or work of other trades. Drawings shall clearly indicate all characteristics, special modifications or features, and exceptions to or deviations from contract requirements.

- D. Order of submittal shall correspond to sequence of specification by section number and paragraph number. Provide dividers at each specification section.
- E. Samples: Submit samples of materials as listed elsewhere herein. Samples shall duplicate materials, workmanship, and finish of products intended for installation.
- F. Product Data: Submit manufacturer's technical product data for circulating pumps showing dimensions, capacities, certified ratings, performance curves with operating point clearly indicated, motor electrical characteristics, pressure gauges, and installation instructions.
- G. Equipment Shop Drawings: Submit assembly-type shop drawings showing unit dimensions, weight loadings, required clearances, construction details, and field connection details of all mechanical materials and equipment to be furnished under this contract.
- H. Construction Shop Drawings: Submit for approval by General Contractor and Engineer construction shop drawings showing all floor and wall penetrations from below grade up through roof. These drawings shall be dimensioned per architectural drawings. Shop drawings shall be submitted by all trades responsible for work under Section 15000 for the specifications which include the Mechanical Contractor.
- I. Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to mechanical equipment. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory installed and portions to be field installed.
- J. Maintenance Data: Submit maintenance instructions, including instructions for lubrication, filter replacement, motor and drive replacement, and spare parts lists. Include this data, product data, shop drawings, and wiring diagrams in Operation and Maintenance manuals; in accordance with requirements of Division 1.

1.7 RECORD DRAWINGS

- A. Provide in accordance with Architectural "General Requirements" section. In addition, location elevations, type and material of construction of all utility lines uncovered during installation of new piping shall be recorded.

1.8 INSTRUCTIONS

- A. Personnel: After completion of installation, competent personnel shall be furnished to instruct Owner's personnel in operation and maintenance of systems.
- B. Written: Furnish three (3) copies of instructions for operating various systems, including complete description of functions and operations of each piece of equipment, automatic control system, and diagrams indicating automatic control hook-up. Control devices shall be identified and their actual location in building noted on diagrams. Include cleaning, oiling, and greasing instructions of each item of equipment. Spare parts list and source of supply shall be identified for each item of equipment. Furnish in loose leaf hardboard 3-ring binders to Architect/Engineer (for delivery to Owner).

1.9 FINAL CHECK

- A. Before submitting proposals, each bidder shall examine all drawings and specifications issued by the Engineer and shall examine the site of work. He shall be fully informed as to character of his work and coordination of his work with that of other trades. No consideration will be given at a later date for alleged misunderstandings as to requirements of work, materials to be furnished or conditions required by nature of site.

1.10 FOUNDATIONS

- A. The Contractor shall furnish all special foundations and supports for equipment which he installs and which are separate and distinct from building construction as shown by architectural drawings. Support equipment from building structures in a manner acceptable to the Architect.

1.11 SAFETY PROVISIONS

- A. Belt, pulleys, chains, gears, couplings, projecting set screws, keys and other rotating parts located so that any person may come in close proximity thereto, shall be fully enclosed or properly guarded.

1.12 RELATED WORK

- A. The following items of material and labor incidental to or related to the work will be provided as follows:
1. Cutting and patching of building structure shall be allowed for installation of pipes, air ducts, etc., by this Contractor. Patching and finishes shall be performed by affected trades. Coordinate all locations requiring core drilling and/or cutting with Construction Manager Superintendent prior to beginning any work. Structural beams, columns, and concrete joists (tees) shall not be penetrated without prior approval of Structural Engineer.
 2. Furring around pipes, ducts, etc., shall be by General Contractor.
 3. Masonry openings for outside air intakes and for exhaust outlets, louvers, etc., including curbs and flashing of roof structure shall be provided by the General Contractor.
 4. All electrical power wiring, conduit, etc., for motors and motor starters shall be furnished and installed by the electrical contractor. Electrical automatic control devices, relays, etc., required for electrical interlock for operation of system shall be furnished complete by this Contractor in strict accordance with all requirements of wiring specifications as a part of the control system. Motor starters shall not be provided under this section of this specification, except as provided as an integral part of the equipment.

PART 2 - PRODUCTS

2.1 QUALITY

- A. Conform to the quality and features specified and indicated by drawings. Where material or equipment is indicated or necessary, but not specifically described in the specifications or drawings, such shall conform to the quality and features of similar items so described or otherwise indicated.

2.2 SLEEVES

- A. Pipe Sleeves:
1. Walls and Partitions: Sleeves 8" Diameter and Smaller (Above Grade): Mild steel or plastic built into wall, partition or beam sized to pass pipe and covering, leaving a clear space of 1/4" minimum between covering and sleeves.
 2. Floors (Above Grade): 14-gauge galvanized steel or plastic, set before floor is poured, sized to pass pipe and covering, leaving a clear space of 1/4" between covering and sleeve, and shall extend 1/2" above finished floor.
 3. Exterior (Below Grade): PVC pipe, size and weight indicated, for passage of piping and conduit under paving and walks. Set at a depth to prevent damage by traffic, and mark location (so that they may be recovered when necessary).
 4. Duct Sleeves: Sleeves or openings sized to pass mechanical ducts and coverings of framed construction in roof, walls and partitions.
- B. Sealing of Sleeves:
1. Below Grade: Caulk annular space between pipe and sleeve using oakum and poured lead both sides minimum 1" deep to make floor penetration watertight.
 2. Above Grade: Make openings around pipes, etc., passing through sleeves draft-free and vermin-proof by packing solidly using mineral wool or glass fiber.

2.3 SUPPORTING DEVICES

- A. Inserts:
1. Preset Type: Malleable iron with removable interchangeable nuts having lateral adjustment of not less than 1 5/8". Continuous inserts shall have a capacity of 2000 lbs. per foot and shall be hooked over reinforcing. Acceptable: C-B Universal Fig. 282; Unistrut Products Co., P-300; Binkley B-32-1.

2. Afterset Types: Self-drilling style expansion shields shall be used in concrete and brick. Toggle bolts shall be used on block walls and partitions.

B. Steel Framing:

1. Steel framing provided with the building structure shall not be used for support of any equipment or piping.
2. Steel framing, as pipe supports and/or beams shall be provided as indicated on plans and as needed for proper support. The Engineer shall direct additional pipe supports to be installed subject to field conditions.

C. Stud Partitions:

1. All anchorage shall be to studs or solid blocking built into the wall.
2. Equipment, Piping and Duct Hangers:
3. Provide angles, brackets, clamps, anchors, braces, frames, rods and other miscellaneous steel items as necessary for support of equipment and piping specified herein.
4. All piping, ducts, etc., shall be run parallel with the lines of the building, unless otherwise shown or noted on the drawings. The different service pipes, valves, fittings, etc., shall be so installed that after the covering is applied there will be not less than 1/2" clear space between the finished covering and other work, and between the finished covering of parallel adjacent pipes. Hangers shall be so spaced to prevent sag and to permit proper drainage. Exact location of piping, ducts, etc., shall be coordinated between subcontractors so that there will be no interference.

2.4 BELT DRIVES

- A. Each motor driven machine not direct connected shall be equipped with OSHA approved V-belt drive. Belts shall be of correct cross section to fit properly in sheave grooves. Belts for each drive shall be carefully matched. Sheaves shall be of cast iron or steel, bored to fit properly on shafts and secured with keys of proper size. Variable and adjustable pitch sheaves shall be furnished for fans and shall be selected so that required rpm will be obtained with sheave set approximately in mid-position. Once equipment has been tested and balanced and a final setting determined by the test and balance agency, a fixed sheave shall replace the adjustable sheave. Final size of fixed sheave shall be determined by test and balance agency. Rating of each drive shall be as recommended by manufacturer for service, but shall be at least 1.5 times nameplate rating of motor.

2.5 BELT AND COUPLING GUARDS

- A. Equip each belt drive with a guard constructed of #12 U.S. standard gauge 3/4" diamond mesh steel wire screen or equivalent, welded to 1/2" steel angle frames which shall enclose all belts and sheaves. Tops and bottoms of guards shall be of #18 U.S. standard gauge steel. Braces or supports must not "bridge" sound and vibration isolators. Guards shall be designed with adequate provision for movement of motor required to adjust belt tension. Provide means to permit oiling, use of speed counters, and other maintenance and testing operations with guard in place. All direct drive equipment shall have coupling guards in accordance with Florida Department of Business Regulation safety regulations.

2.6 PAINTING AND MARKING

- A. Painting: Painting of equipment, pipe, and ducts (insulated or uninsulated) shall be as specified in Section "Painting". Touch-up of shop coats shall be performed under section furnishing equipment and shall match equipment factory finishes.
- B. Marking:
 1. Pipes: Exposed piping shall be stenciled with name of service to indicate the use of pipe and with arrows to indicate direction of flow. Stencils shall be applied after final painting is completed. In lieu of stencils, pipe identification labels similar to "Brady" may be used. Bands shall be color coded. Markings shall be in accordance with ANSI Std A-13.1.

2. Equipment: Fans, ducts, etc., shall be stenciled as specified above. Small equipment such as starters, control devices, etc., shall be neatly labeled with small engraved laminated plastic labels. Labels shall be permanently attached to equipment.

2.7 ELECTRICAL

- A. General: Unless specified otherwise, motors and control devices shall be furnished under the division of the specifications that covers the driven equipment. Motor starters shall be provided and installed by the electrical contractor except where as an integral part of the equipment. All electrical power wiring, conduits, and connections shall be provided under the Electrical Section. Contractor furnishing driven equipment shall coordinate wiring diagrams with contract requirements and shall furnish coordinated wiring diagrams for installation.
- B. Motors: Unless otherwise specified, each motor shall have sufficient capacity to start and operate the machine it drives without exceeding the motor nameplate ratings the speed required. (Except that the NEMA standard service factor may be applied to motors that are water or refrigerant cooled.) The horsepower specified are those estimated to be required by the equipment when operating at specified duties and efficiencies. If the actual horsepower for the equipment to be furnished differs from that specified or indicated on drawings, it shall be the responsibility of the Section furnishing equipment to insure that proper size feeders, breakers, etc., are provided at no change in contract cost. Motors shall be rated for continuous duty, at 100% of nameplate rating with a service factor of 1.15. Squirrel cage induction motors shall have normal starting torque, full voltage low starting current, constant speed continuous duty type. Motors shall be wound for specified voltage.
- C. Starters to be furnished under this section of the specification shall be as an integral part of the equipment.
- D. Starters shall have proper rating for motors controlled.
- E. Overcurrent Protection: Contacts shall break each ungrounded line to the motor. A thermal overcurrent device shall be provided in each ungrounded line. All contacts shall open simultaneously upon tripping of any overcurrent device.
- F. Magnetic Starters: All motors of 2 HP or larger. Each starter shall have a control transformer with fused 120 volt maximum control circuit. Control transformer shall be of adequate capacity for all controls on the circuit. Starters shall have on-off-automatic switches in cover.

PART 3 - EXECUTION

3.1 TESTS

- A. General: All systems shall be inspected, tested, given a trial run, and demonstrated to Engineer's satisfaction that they are complete and ready for operation.
- B. Piping: Unless required otherwise by code or other sections of specifications, test at a pressure of 150 percent of normal working pressure.
- C. Air Conditioning Systems: Operate equipment and log readings of energy consumed, water flow, air flow and temperatures to permit evaluation of equipment capacities. Refer to Section "Test and Balance".

3.2 ACCEPTANCE

- A. Prior to requesting final inspection:
- B. Complete work required by drawings and specifications.
- C. Balance air conditioning systems in accordance with Section "Test and Balance".
- D. Acceptance will be by Architect on basis of tests and inspection of project. Contractor shall furnish necessary mechanics to operate system, furnish test instruments and equipment as required, make necessary adjustments and assist with final inspection.

END OF SECTION

SECTION 15200 - SYSTEM TEST, ADJUSTING AND BALANCING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All General Provisions, including (but not limited to) General and Supplementary Conditions and General Requirements, apply to the Work specified in this section.

1.2 DEFINITIONS

- A. Where specifically referred to in these specifications, the following terms are defined as follows:
 - 1. Owner: Baldwin County School System
 - 2. TAB: Test, Adjusting, Balancing
 - 3. Contractor: TAB Contractor
 - 4. Engineer: H.M. Yonge & Associates, Inc. Consulting Engineers

1.3 SCOPE OF WORK

- A. The Mechanical Contractor shall be responsible for the services of this testing and balancing contractor. The Mechanical Contractor shall include the cost of these professional services in their bid. Included with this responsibility shall be the coordination of the Testing and Balancing Contractor with the Commissioning Contractor to provide the services as indicated under Commissioning Specification Section 15995.
- B. System Test and Balance shall be performed by a contractor certified by the Associated Air Balance Council (AABC) or the National Environmental Balancing Bureau (NEBB) and approved by the Engineer. All work done by this Contractor shall be by qualified technicians under the full-time direct on-site supervision of a Certified Test and Balance Engineer who is under the full time employ of the Contractor.
- C. System balance shall be performed in accordance with the latest edition of AABC National Standards and in accordance with the requirements specified herein. In case of conflict, most stringent shall apply.
- D. System balance shall not begin until systems are completely installed and operational. Report inability to begin system balance in writing to the Engineer, listing justification for same.
- E. Upon completion of the Work, the TAB Contractor shall submit six (6) copies of the complete TAB Report to the Engineer for approval.
- F. One TAB Contractor shall be responsible for all phases of system balance.
- G. Contractor shall permanently mark the settings of all valves, dampers, and other adjustment devices in a manner that will allow the settings to be restored. If a balancing device is provided with a memory stop, it shall permit closing and reopening the valve to its balanced position.
- H. System shall be balanced for full performance in cooling mode of operation.
- I. In Progress Inspections: The Test and Balance Agency shall be furnished with plans and specifications by the Engineer as soon as TAB contract is awarded.
 - 1. Plans and specifications shall be reviewed by the TAB Contractor prior to bid and if any discrepancies are noted which would hinder TAB services the Engineer shall be notified.

1.4 QUALIFICATIONS OF TAB CONTRACTOR

- A. The TAB Contractor shall be certified by the AABC and/or the NEBB, and shall possess current certification of same at time of bid. TAB Contractor shall have been in business full time performing services as defined herein for three (3) years prior to bid opening.
- B. Field technicians performing TAB services under the contract shall themselves be AABC certified for at least twelve (12) months prior to bid. Non-qualified field technicians shall not be acceptable.

1.5 TEST INSTRUMENTS

- A. Test instruments shall be first quality and designated as a "test" quality whenever so offered by equipment manufacturer. TAB shall certify in writing to Engineer that instruments were inspected and calibrated within thirty (30) days to use.
- B. The following represents test instruments required for use. Manufacturer substitutions shall be approved prior to use by Engineer:
 - 1. Flow Hoods (Shortridge Model CFM-83)
 - 2. Velometer (Alnor)
 - 3. Incline Manometers (Weiss)
 - 4. Magnehelic Gauge (Weiss)
 - 5. Pitot Tubes (Johnson) Various sizes
 - 6. O-250 PSI Test Gauge (VS Gauge) 2% accuracy
 - 7. Digital Tachometer (5% accuracy)
 - 8. Digital Thermometer (5% accuracy) ASTM
 - 9. Digital VOM (Fluke)
 - 10. Sound Level Meter
 - 11. Vibration Analyzer

1.6 TAB SUBMITTALS

- A. TAB Contractor shall submit following to Engineer for approval within thirty (30) days after contract award:
 - 1. Detailed TAB procedures
 - 2. Agenda
 - 3. Resumes of project staff
- B. Test and Balance Forms:
 - 1. The following is a list of equipment requiring Test and Balance forms, reference National Standards, AABC, Fourth Edition, 1982, for inclusion in the Test and Balance submittal. Each line item of the forms must be completed prior to acceptance of project completion.
 - a. General Data T & B Equipment Data
 - b. Direct Expansion Packaged Air Conditioning Units
 - c. Exhaust Fans
 - d. Kitchen Exhaust Hood
 - e. Kitchen Supply Fans
 - f. Air Terminal Unit(s)
- C. An approved copy of each of the above must be returned by the Engineer to the TAB Contractor before Systems Balance is begun.
- D. If a complete submittal is not received within the specified time, the Engineer reserves the right to furnish the TAB Contractor with approved TAB procedures for use by the Contractor with no cost to increase to Owner.

1.7 COORDINATION AND WORK PERFORMED BY OTHER TRADES

- A. It shall be the responsibility of the TAB Contractor to coordinate work with the Prime Construction Contractor only, if other trades are involved with project.

- B. In order that all systems may be properly tested, balanced, and adjusted as required herein by these specifications, the General Construction Contractor shall operate said systems at his expense for the length of time necessary to properly verify their completion and readiness for TAB.
- C. Project contract completion schedules submitted by the Prime Construction Contractor shall provide sufficient time to permit the completion of TAB services prior to Owner occupancy.
- D. The scope of the TAB Work as defined herein is included in order that Prime Construction Contractor will be appraised of the coordination, adjustment, and system modification which will be required under the project work in order to complete the Owner's requirement for final TAB. The TAB Contractor will not have a contractual relationship with this Contractor, but will be responsible to the Engineer for the satisfactory execution of the TAB work. The Prime Construction Contractor shall allow sufficient funds in his project cost estimate and bid proposal to cover all work which may be required of him in the TAB phases as defined herein and as may be necessary for the completion of the TAB work as defined by the TAB specifications.

1.8 RESPONSIBILITIES OF PRIME CONSTRUCTION CONTRACTOR FOR TAB WORK

- A. As a part of their project contract, the Prime Construction Contractor shall make or cause to be made any changes in the sheaves, belts, dampers, and/or control system elements required for correct balance as required by the TAB firm, at no additional cost to the Owner.
- B. The plans and specifications have indicated valves, dampers and miscellaneous adjustment devices for the purpose of adjustment to obtain optimum operating conditions, and it will be the responsibility of others to install these devices in a manner that will leave them accessible and readily adjustable. Should any such device not be readily accessible, the TAB Contractor shall notify the Engineer. Also, any malfunction encountered by TAB personnel shall be reported to the Engineer of the Construction Inspector.
- C. After completion of the mechanical work, the TAB Contractor shall notify the Owner in writing, certifying that the work has been accomplished and that the building and the air conditioning systems are in readiness for testing, adjusting, and balancing.
- D. The Architect/Engineer shall furnish one (1) complete set of as-built Plans and Specifications prior to TAB work, including:
 - 1. Addenda
 - 2. Change Orders
 - 3. Approved Shop Drawings
 - 4. Approved Submittals
 - 5. Approved Temperature Control Diagrams
- E. The Prime Construction Contractor is responsible for start-up and operation of systems during System Balance. Start-up shall include (but not be limited to) the following:
 - 1. All equipment operable in safe and normal condition.
 - 2. Temperature control systems installed complete and operable.
 - 3. Proper thermal overload protection in place for electrical equipment.

1.9 LIAISON AND EARLY INSPECTION

- A. TAB Contractor shall inspect the installation of mechanical piping systems, sheetmetal work, temperature controls, and all other component parts of the exhaust and ventilation systems during the construction stage for the purpose of reviewing that part of the work relating to proper arrangement and adequate provisions for testing and balancing.
- B. During the balancing process, if or when abnormalities and malfunctions of equipment or components are discovered by the TAB Contractor, the Engineer shall be advised in writing by the Contractor so that the condition can be corrected by the prime construction contractor. Data from malfunctioning equipment shall not be recorded in the final TAB report. The TAB Contractor will not instruct or direct the Prime Construction Contractor in any of the work, but will make such reports as are necessary direct to the Owner.

1.10 TAB REPORT

- A. The activities of described above will culminate in a final TAB report to be provided to the Engineer or his delegated representative. The intent of the report is to provide a reference of actual operating conditions for the Owner's operating personnel.
- B. All measurements and recorded readings (of air, electricity, etc.), that appear in the reports must be done on-site by the permanently employed technicians or engineers of the TAB Contractor, under the direct field supervision of the TAB Engineer.
- C. At the option of the Engineer, all data sheets tabulated each day by TAB personnel may be reviewed. Those work sheets so reviewed, or copies thereof, shall be included in the final TAB report as a supplement, not as the report itself.
- D. The report shall be certified and approved by the test and balance engineer of the TAB Contractor and his seal shall appear on the first page of each copy. The report shall be recorded on standard AABC or NEBB forms approved by Engineer.
- E. The TAB measurements and report shall include the following as a minimum:
 - 1. PREFACE: A general discussion of the system, any idiosyncrasies, any problems encountered, an outline of normal and ventilation cycles of operation, any noise problem not corrected.
 - 2. PITOT TUBE TRAVERSES: For use in future trouble-shooting by maintenance personnel, all exhaust ducts, shall have air velocity and volume measured and recorded by the traverse method. Locations of these traverse test stations will be described on the sheet containing the date.
 - 3. AIR VOLUMES & VELOCITIES: As measured at each exhaust air grille. It shall be the obligation of the Prime Construction Contractor to furnish or revise fan drive and/or motors, if necessary, without cost to the Owner, to attain the specified air volumes.
 - 4. EXHAUST FANS: Fans checked for rotation, amperage, static pressure. Field set for maximum and minimum CFM balanced to within 10% + to design.
 - 5. STATIC PRESSURE DROPS: As measured across each supply fan, cooling coil, air handling unit filter and exhaust fan. Relate these readings to the particular fan curve in terms of CFM handled.
 - 6. ELECTRICAL CURRENT/VOLTAGE: Measurements to be taken at the drive motor on each piece of equipment.
 - 7. FAN SPEEDS: To be measured in RPM and discharge CFM (all exhaust and supply).
 - 8. INSTRUMENTATION LIST: A list of instruments by type and make used in gathering the TAB data, together with date of most recent calibration.
 - 9. TEMPERATURE CONTROLS: Verify proper sequencing, proper calibration, measure temperature at each sensor, note any sensor not controlling to within 2% of set point.
 - 10. DRAWINGS: The drawings furnished to TAB Contractor will have the mechanical system components numbered and/or lettered by the TAB Contractor to correspond to the numbers and letters used on the report data sheets so that data in the report can be correlated with each specific supply air opening in the building.
 - a. Only one such marked up set of drawings need be provided with the three (3) copies of the TAB Report.
- F. Before final acceptance of the TAB Report, the report data, at the discretion of the Engineer, shall be verified on the job site, by selection of check points at random, in the presence of the Owner's representatives. Representatives of the testing firm doing the work shall be present and provide the necessary equipment for test data verification. The Owner shall notify the TAB Contractor of the acceptance of the report after clarification of any questions on the data recorded therein. If the balancing operation is delayed significantly through no fault of the TAB Contractor during the performance of their work, said firm shall be entitled to an interim payment which shall not exceed the value of the work accomplished at that time. This payment amount shall have the concurrence of the General Contractor.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 GENERAL

- A. The TAB Contractor shall check, adjust, and balance with testing all components of the ventilation, exhaust, systems which will result in optimum noise, temperature, air flow in the building while the equipment of the system is operating. This is intended to be accomplished after the system components are installed and operating as provided for in the contract documents, which is the responsibility of the Prime Project Contractor.
- B. The TAB Contractor shall be responsible for inspecting, adjusting, balancing, and logging the data on the performance of fans and the power consumption of all motors.
- C. During the TAB work, the temperature regulation will be adjusted for proper relationship between controlling instruments. The Engineer will be advised of any instruments out of calibration so that the controls subcontractor may come in to recalibrate, using data supplied by the balancing firm. After recalibration, room temperatures shall be retaken as described in "Temperature Tabulation" paragraph.
- D. TAB services shall be performed in accordance with AABC National Standards for Field Measurement and Instrumentation latest edition.

3.2 SERVICES

- A. Provide the following minimum services (including but not limited to):
 - 1. Pre-construction plan and specification review for assurance of system balanceability.
 - 2. Project visits and reports of inspection of fabrication and erection procedures of system installing contractor(s) on periodic basis as specified herein during construction for conformance with contract requirements. Expedite any required corrective measures.
 - 3. Coordinate with Engineer on system modifications. Revise balancing procedures to accommodate changes in intended space usage.
 - 4. Balance systems for maximum efficiency at minimum energy usage.
 - 5. Final balancing shall provide comfortable conditions to the satisfaction of the Owner.
 - 6. Provide performance guaranty along with final TAB Reports.

3.3 GENERAL PROCEDURES

- A. The TAB Contractor shall cooperate with the Engineer and all contractors to perform the work in such a manner as to meet the job schedule, providing that sufficient lead time for Test and Balance has been allowed.
- B. The TAB Agency shall leave all system components clean and in proper working order, such as replace belt guards, close access doors, close doors to electrical switch boxes, and restore equipment thermostats to specified settings.
- C. All recorded data shall represent a true, actually measured, or observed condition.
- D. Any abnormal conditions in the mechanical systems or conditions which prevent System Balance, as observed by the TAB Contractor shall be reported as quickly as possible to the individual responsible.

3.4 SYSTEM READINESS PRIOR TO TEST AND BALANCE

- A. The TAB Contractor shall, at minimum, inspect the ventilation, exhaust and temperature control system(s) prior to TAB work to verify system readiness for TAB work. TAB Contractor shall check the following items:
 - 1. Air Distribution Systems (negative pressure systems):
 - a. Verify that installation conforms to design.

- b. All fans (exhaust) operating and verified for freedom from vibration, proper fan rotation and belt tension heater elements in motor starters to be of proper size and rating; record motor amperage and voltage on each phase at start-up and running, and verify they do not exceed nameplate ratings.
- 2. Automatic Controls:
 - a. Verify that all control components (including EMCS hardware and software) are installed in accordance with project requirements and functional, including all electrical interlocks, damper sequences, air and water resets, fire and freeze stats.
 - b. All controlling instruments calibrated and set for designed operating conditions.
- 3. Tabulated Data:
 - a. The motor amperages and voltages indicated in above shall be recorded showing "actual" and "nameplate" voltage and amperage. This applies to each piece of electrically driven air conditioning and heating equipment in the system including all fans.

END OF SECTION

SECTION 15400 - PLUMBING

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. The work to be performed under this section of the Specification shall include all labor, materials, equipment, transportation, construction, facilities, and incidentals necessary for the proper execution and completion of all Plumbing work as shown and indicated on the Contract Drawings, and/or specified herein with the intent that the installation shall be complete in every respect and ready for use. The work required under this section of the specification shall include specifically, but is not limited to the following:
 - 1. Cold water piping and connections to new fixtures as shown or indicated on the drawings.
 - 2. Hot water supply piping, including connections to new fixtures, as shown or indicated on the drawings.
 - 3. A system of sanitary soil, waste, and vent piping including connections to existing services, and new fixtures as shown or indicated on the drawings.
 - 4. A system of thermal insulation for all new potable water piping.
 - 5. All fixtures and equipment as hereinafter specified, completely installed and operational.
 - 6. All necessary cutting and/or core drilling to install plumbing systems in this section.

1.2 RELATED DOCUMENTS

- A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 1 specification sections apply to work specified in this section.

1.3 GUARANTEE

- A. All materials and equipment provided and/or installed under this section of the specifications shall be guaranteed for a period of one year from the date of acceptance of the work by the Owner. Should any trouble develop during this period due to defective materials or faulty workmanship, the Contractor shall furnish all necessary labor and materials to correct the trouble without any cost to the Owner. Any defective materials or inferior workmanship noticed at the time of installation and/or during the guarantee period shall be corrected immediately to the satisfaction of the architect.

1.4 CODES AND REGULATIONS

- A. All work performed under this section shall conform with all local governing regulations, and in case of conflicting requirements, the most stringent shall apply. Minimum requirements shall be the International Building Code. All electrically operated equipment specified in this section shall comply with the National Electrical Code.
- B. Should it be found that any part of the work shown or specified is not in accordance with local regulations, the Architect shall be so advised at the time of bidding and all work installed as required to meet the local codes.
- C. The Contractor shall comply with the latest revisions of all county, district, municipal, or local building codes, interpretations, buildings permits to include but not be limited to:
 - 1. 2021 International Building Code
 - 2. 2021 International Fuel Gas Code
 - 3. 2021 International Fire Code
 - 4. 2021 International Mechanical Code
 - 5. 2021 International Plumbing Code
 - 6. 2010 ADA Standards for Accessible Design
 - 7. NFPA-101 - Life Safety Code

- 8. Local Municipal Codes
- 9. National Electrical Code (NFPA 70)

1.5 FEES AND PERMITS

- A. The Plumbing Subcontractor shall obtain and pay for all permits, fees for inspection, and other charges that may be necessary for fully completing the work. The Plumbing Subcontractor shall make all necessary tests required by City, County, or State authorities, legal regulations, and/or the Architect, and return to the Architect any certificates of approval issued in this district for plumbing work, etc. signed by the inspector in charge of each particular part of the work.

1.6 RECORD DRAWINGS

- A. Contractor shall keep a set of reproducible drawings on site at all times and log all changes made during construction period. No deviations from the drawings and specifications shall be made without full knowledge and consent of the Architect. Record drawings shall show dimensions, locations, and depth of all buried and concealed piping, plugged outlets, and equipment, and shall keep up-to-date. No plumbing progress payments will be approved unless as-built drawings are up-to-date. Upon completion of work, sepias shall be turned over to the Architect.

1.7 COOPERATION

- A. The Contractor shall lay out and proceed with his work so that this work will be executed in harmony with all other contractors and trades on the job.

1.8 VISITING THE PREMISES

- A. The Contractor, before submitting his bid on the work, must visit the site and familiarize himself with all existing conditions. As a result of having visited the premises, the Contractor shall be responsible for the installation of the work as it relates to such existing conditions. The submission of a bid will be considered an acknowledgment on the part of the bidder of his visitation to the site.

1.9 VERIFICATION OF CONTRACT DRAWINGS

- A. The drawings and specifications are intended to cooperate. Any materials, equipment, or systems related to this section and exhibited on the architectural and plumbing drawings, but not mentioned in the specifications are to be executed to the intent and meaning thereof, as if it were both mentioned in the specification and set forth on the drawings. Where the Contractor finds the specification and/or drawings to be in conflict or where they are not clear, same shall be brought to the attention of the Architect prior to submitting a bid.
- B. The plans indicate the general arrangement of the existing utilities. The locations of piping are approximate for clarity. Exact locations shall be determined in the field by the Contractor. In the event it should become necessary to change the locations of any work due to building construction, etc., the Contractor shall secure the approval of the Architect before making the changes. Any changes approved by the Architect shall be made without added cost to the Owner. Under no circumstances shall the sizes indicated on the drawings be changed without securing written approval of the Architect.
- C. The drawings are diagrammatic and do not necessarily show or indicate all fittings, offsets, and accessories which may be required. The Contractor shall carefully investigate the structural and finish conditions affecting all his work as well as the operational requirements of each system and shall arrange such work accordingly, furnishing such fittings, etc., as may be required for the proper and efficient functioning of each system. No unnecessary or unauthorized offsets will be permitted.

1.10 WORKMANSHIP

- A. All workmanship performed under this section shall be executed in a first class manner in accordance with the best practices of the trade. The Architect reserves the right to accept or reject workmanship and determine when the Contractor has complied with the requirements herein specified. Only competent mechanics skilled in their respective trades shall be employed by the Contractor.

1.11 RESPONSIBILITY OF BIDDER

- A. Each bidder shall visit the site of the proposed work and fully acquaint himself with conditions relating to the construction requirements so that he may fully understand the facilities, difficulties and restrictions contingent upon the execution of the work under this contract. The failure or omission of any bidder to receive or examine any form, instrument, addendum or other document shall in no way relieve any bidder from his obligations with respect to his bid or the contract. The submission of a bid shall be taken as prima facie evidence of compliance with this paragraph and that he has included in his proposal every item of cost necessary for a complete installation of air conditioning, heating and ventilation operations strictly as planned, specified, and intended.

1.12 NOISE AND VIBRATION

- A. This Contractor shall be held responsible for elimination of all noises or vibrations transmitted to occupied areas from equipment which he may install. This applies particularly to vibration and noises in piping. He shall furnish and install water hammer arrestors, flexible connectors for piping, etc., as may be necessary.

1.13 SUBMITTAL DATA

- A. Materials and equipment schedules shall be submitted as soon as practicable, but not later than 30 days after the date of award of contract, and before commencement of installation of any material or equipment. A complete schedule of the material and equipment proposed for installation shall be submitted in proper binders (3-ring or fastener type), properly marked for approval by the Architect. The schedule shall include catalogs, cuts, diagrams, drawings, specifications and such other descriptive data as may be required by the Architect. The schedule and supplementary data shall be submitted in six (6) copies, and approval obtained. All materials required to be submitted for approval under this section shall be submitted at one time.
- B. Partial submittals will not be considered. Each item submitted shall be identified by its applicable drawing number.
- C. Where equipment named as equivalent or approved equal are proposed for use by the Contractor, he shall be responsible to coordinate any changes with all trades affected.
- D. The following equipment and material shall be submitted for approval:
 - 1. Valves
 - 2. Cleanouts
 - 3. Access Panels
 - 4. Piping and materials
 - 5. Insulation
 - 6. Pumps
 - 7. Plumbing fixtures, including traps, supplies, and carriers
 - 8. Grease Traps
 - 9. Water Hammer Arrestors
 - 10. Floor Drains
 - 11. Trap Primers
 - 12. Water Heaters

1.14 START-UP SERVICE

- A. The Contractor shall put all items installed under this section into operation and shall instruct the Owner's maintenance personnel in all points requiring service and maintenance. Further, the Contractor shall make all adjustments and/or service requirements to said equipment during the first 60 days of actual occupancy.

1.15 PIPING

- A. Provide pipe sleeves through masonry construction, and install escutcheon plates around exposed piping in all rooms.
- B. Soil, waste and vent lines shall be Schedule 40 PVC-DWV in accordance with Commercial Standards CS272-65 or ASTM Standards D2665-68. Soil, waste, and vent lines penetrating a fire rated wall or floor shall be service weight cast iron at the point of penetration only.
- C. All plastic pipe shall bear the NSF Seal of Approval, and such other markings as required by the aforementioned standards.
- D. Above slab cold water and hot water piping shall be Type "L" hard copper with sweated joints, using wrought fittings and non-corrosive flux. Below slab cold water piping shall be type "K" soft copper tubing.
- E. Waste piping serving within the first thirty feet of areas where temperatures may be expected to exceed 140 degrees F shall be Spears® LabWaste™ CPVC piping or equal. Soil, waste, and vent systems penetrating a fire rated wall or floor shall be cast iron soil pipe. Below grade installation of thermoplastic pipe shall be installed in accordance to the ASTM D 2321* standard.
* most current edition
- F. Where pipes pass through firewalls, fire partitions, or fire rated floors, an approved UL Fire Seal shall be provided. System employed shall be assigned an approval number in accordance with 1990 Fire Resistance Directory published by Underwriters' Laboratories.

1.16 PIPE SUPPORT

- A. Hangers: Support all suspended piping with clevis type hangers equal to Piping Technology and Products Fig. 83, 5'-0" o.c. When attached to open-web bar joists, the hanger shall be supported from both chords at the same time. The hanger is preferred to pass between the chords, not attached to the webbing member, and supported on top of the chords. This is a concentric application. Architect shall approve all methods of attachment of hangers to construction. Hangers in contact with copper piping shall be copper, or copper plated. Within the storm shelter area, hangers shall be installed at 2'-6" o.c and piping shall be appropriately braced.
- B. Vertical Support: Steel bar base clamped to pipe or grip strut channel with offset clamps. Support members to be of same material as supported material where possible.
- C. All anchorage shall be to studs or solid blocking built into the wall. No plumbing straps shall be used.

1.17 PIPING PLACEMENT

- A. Place in most direct manner permitted by construction, free of unnecessary offsets, making changes in direction by means of standard fittings.
- B. Grade 2" waste lines 1/4" per foot and 3" and 4" waste lines 1/8" per foot for positive flow. Secure all piping to structure.
- C. Changes in direction of drainage pipe shall be made by means of suitable bends and branches of Y's and long sweeps. Short radius quarter bends are prohibited. Make no change in direction of flow greater than 90°. Where different sizes of drainage pipes or fittings are connected, use standard increasers and reducers of proper size. Do not reduce size of drainage piping in direction of flow. Drilling and tapping of house drains, soil waste or vent pipes, and use of saddle hubs and bands are prohibited.
- D. Waste Arms: Type "K" copper or IPS brass pipe typical; Alloy steel or IPS brass pipe at urinals.
- E. Test Fittings :
 - 1. Not shown on the drawings; provide where required for partial tests. Provide test tees at base of all stacks.
 - 2. Hand holes with brass ferrules and brass trap screws for cleanouts shall be placed at ends of soil and waste pipe and where otherwise shown on plans or as required on job. Cleanouts to be brought flush with face of walls. All threaded plugs shall be full size of pipe on which

placed up to 4".

F. Soil Pipe

1. Support to firm earth below floor slabs.
2. Changes in direction of drainage pipe shall be made by means of suitable bends and branches of Y's and long sweeps. Short radius quarter bends are prohibited.
3. Connections of vertical soil pipe to all connections in horizontal soil pipe to be made by "Y" fittings.

G. Vent Pipes

1. Main soil pipe stacks to be extended up through the building full size with increaser through roof per code.
2. Connect branch vents into main stacks with connections not less than 4 feet above the highest fixture.
3. All vent stacks shall be connected at the bottom to main drainage system and all horizontal runs shall be graded so as to discharge all water or condensation.

H. Water Piping

1. Place supply pipes as shown or as directed in neat arrangement and parallel or at right angles to walls, joists, etc.
2. Place shock absorbers at each fixture group as recommended by manufacturer. Shock absorbers shall be PDI certified.
3. Place valves on all water pipe risers and branch lines at point where risers and branch lines connect to main water lines.

PART 2 – PRODUCTS

2.1 WATER PIPING

- A. All water piping, unless otherwise shown or specified shall be copper pipe Type L or K as specified having a wall thickness of not less than .035 inches. It shall be clean, round, straight, and true to size, free from flaws and other defects.
- B. All fittings on copper pipe shall be copper. The pipe and fittings shall be thoroughly cleaned before inserting into the joint and then soldered with lead free solder.

2.2 GAS PIPING

- A. All piping above grade shall be Schedule 40 black steel ASTM 120. Fittings shall be 150 pound black malleable screw pattern for all sizes 2" and smaller.
- B. Piping below slab shall be vented and encased in a sleeve of polyethylene, or other approved water resistant material. This can be accomplished using the pre-sleeved TracPipe PS-II system (or equal).
- C. All piping shall be installed in accordance with NFPA recommendations and the National Fuel Gas Code complete with all necessary appurtenances.
- D. Horizontal piping shall grade with a slope of 1" on 40 feet-0" to drip legs at all low points as required. Drips shall be provided at all low points and at bottom of risers. Drips shall be same size as the piping where installed and shall be a minimum of 12" long.
- E. Use ground joint unions in all screw piping joints.
- F. Piping shall be painted with yellow enamel and labelled with service and flow direction. Labels shall be secured to piping at spacings of no more than 15'-0".
- G. Gas appliance regulators shall be listed with ANSI Z721.80/CSA 6.22.

2.3 UNIONS

- A. Unions shall be provided on inlet and outlet of all apparatus and equipment. Where valves are adjacent to equipment, unions shall be between valves and equipment.
- B. Unions in copper pipe shall be cast bronze, WOG pattern, ground joint, 150 psi type.
- C. Unions in steel pipe shall be malleable iron, WOG female pattern brass seat, ground joint, 150 psi type.
- D. Unions connecting dissimilar metals shall be dielectric type.

2.4 TRAP PRIMER DISTRIBUTION UNIT

- A. A trap primer distribution system shall be equal to Precision Plumbing Products DU-4 to serve no more than four fixtures off one primer distribution unit. Unit shall be installed per manufacturer's instructions.

2.5 VALVES AND COCKS

- A. Valves and cocks shall be installed where shown on the drawings, and/or where found to be necessary for proper operation of the system. All branches from risers, all branches from mains, and all fixtures or equipment not having stops shall be provided with valves whether shown or not.
- B. Angle or straightway chromium plated stops on the supplies to all fixtures accessible from the same room in which the fixtures are located.
- C. All valves shall be the product of one manufacturer as cataloged by Milwaukee, Stockham, Crane, or Nibco.
- D. For water piping, valves shall be equal to 125 psi SWP/200 psi WOG Nibco as follows:
 - 1. Gate valves 1/2" to 3" = S-111.
 - 2. Ball valves 1/2" to 2" = S-585.
 - 3. Check valves 1/2" to 3" = S-413W.

2.6 WALL HYDRANTS

- A. Interior wall hydrants shall be encased, anti-siphon, automatic draining, keyed with nickel bronze face plate. Mount flush with wall. Wall hydrant shall be equal to Zurn
- B. Z-1325. Coordinate wall thickness at installation location. Adjust location as necessary to enclose piping within the wall.
- C. Exterior hydrants (except at dumpster pad) shall NOT be wall hydrants. Exterior hydrants shall each be Zurn Z1360 ground hydrants with a locking cover. Coordinate final locations and ensure units are adequately protected from freezing by running piping 36" below grade in sleeving. Freezeproof hydrants shall be installed in compliance with IPC section 608 and the Zurn Z1360 ground hydrants shall be permanently identified with signage reading as follows: "CAUTION, NONPOTABLE WATER. DO NOT DRINK."
- D. Exterior dumpster pad wall hydrant shall be encased, anti-siphon, automatic draining, non-freeze, with nickel bronze faceplate, keyed hinged cover. Wall hydrant shall be equal to Zurn Z-1325. Coordinate wall thickness at installation location. Adjust location as necessary to enclose piping within the wall.

2.7 THERMAL INSULATION WORK

- A. All insulation work shall be performed by experienced insulation application mechanics thoroughly familiar with and experienced in the application of insulation materials. All insulation materials shall be applied in accordance with manufacturer's published recommended methods. Installation and finish of insulation materials shall meet with complete data for approval of materials and application methods as proposed for use. All piping shall be pressure tested and all surfaces shall be thoroughly cleaned before covering is applied. Insulation materials, including sealer, adhesive, finished, etc., shall meet NFPA Standards with regard to flame spread and support of combustion.

- B. All domestic cold water piping and all hot domestic water piping less than 1-1/2" in diameter shall be covered with 1" thick heavy density fiberglass sectional pipe insulation equal to Owens Corning Fiberglass 25 ASJ/SSL, excluding piping below grade or chromium plated fixture connections. All hot domestic water piping 1-1/2" in diameter or larger shall be covered with 1-1/2" thick heavy density fiberglass sectional pipe insulation equal to Owens Corning Fiberglass 25 ASJ/SSL, excluding piping below grade or chromium plated fixture connections. All piping inside masonry walls shall be insulated; no exceptions. Armaflex type insulation shall be allowed only before building is dried-in in those locations which will be inaccessible for the installation of the aforementioned fiberglass insulation. All exposed hot and cold water piping shall be labelled as required by ASME A13.1.
- C. Fittings for the above shall be insulated with premolded fitting insulation of the same material and thickness as the adjacent insulation and shall be covered with a premolded plastic (PVC) vapor barrier and sealed with vapor barrier lagging adhesive. Covering adjacent to unions and other points of termination shall be finished with the plastic material neatly beveled.
- D. It shall be the responsibility of the insulation subcontractor to coordinate hanger locations and prevent crushing or breaking finishes. Provide saddles with blocking as necessary.
- E. Contractor shall insulate hot water supply assembly and P-Trap assembly with insulation kit equal to Brocar or Trubro on handicapped lavatories.

2.8 FLOOR, WALL, AND CEILING PLATES

- A. Nickel plated floor, wall, and ceiling plates shall be provided on all pipes passing through floor, ceiling, or partition. Nickel or chromium plated escutcheons shall be provided on all fixture supplies.

2.9 PLUMBING FIXTURES AND EQUIPMENT

- A. Provide roughing-in for and connect to supply lines, waste and vent lines, all equipment, fixtures, drains, etc., specified herein or in other sections of the specifications which require such connections.
- B. Provide stops in hot and cold water connections to each fixture, equipment items, etc. Where not otherwise specified, stops shall be same as specified hereinbefore for ball valves. Provide deep escutcheon on all sinks and lavatories where waste pipe goes into wall. Anchor all supplies from wall securely within wall construction.
- C. Provide stops for all fixtures. Traps for all fixtures shall be 17- gauge chromium plated brass.
- D. Plumbing fixtures shall be equal to American Standard, Crane, Kohler, Just, Elkay or Eljer. Faucets and valves shall be equal to Sloan, Zurn, Delta, American Standard, Kohler, Just or T&S Brass. No others will be accepted.
- E. Plumbing fixtures shall be as follows:
 - P-1 WATER CLOSET: Kohler K-4406 elongated bowl, floor mounted, floor outlet, flush valve type with Sloan Royal 111 flush valve. Provide Olsonite 10SSC white open front seat (less cover) and two bolt caps.
 - P-1A HANDICAP WATER CLOSET: Kohler K-4368, 17-1/2" high elongated bowl, floor mounted, floor outlet, flush valve type with Sloan Royal 111 flush valve. Provide Olsonite 10SSC white open front seat (less cover) and two bolt caps. Install per ADA requirements.
 - P-2 URINAL: Kohler K-4960-ET, wall hung, vitreous china with Sloan Royal 186 -1.0 flush valve and Zurn Z1222 wall carrier.
 - P-2A HANDICAP URINAL: Kohler K-4960-ET, wall hung, vitreous china with Sloan Royal 186-1.0 flush valve and Zurn Z1222 wall carrier. Mount fixture in compliance with ADA for handicap use.
 - P-3 LAVATORY: Kohler K-2005, 20" x 18" wall hung vitreous china with Delta 505 single lever faucet and grid waste. Bowl depth not to exceed 5-1/2". Provide 1-1/4", 17-gauge P-Trap, flexible supplies equal to Brasscraft, stops, Leonard model 170 thermostatic

mixing valve, and Zurn Z1231 concealed arm carrier. Provide insulation kit on all exposed piping.

- P-3A HANDICAP LAVATORY: Kohler K-2005, 20" x 18" wall hung vitreous china with Delta 505 single lever faucet and grid waste. Bowl depth not to exceed 5-1/2". Provide 1-1/4", 17-gauge P-Trap, flexible supplies equal to Brasscraft, stops, Leonard model 170 thermostatic mixing valve, and Zurn Z1231 concealed arm carrier. Install per ADA requirements. Provide insulation kit on all exposed piping.
- P-4 WATER COOLER: Dual type, wall mounted, barrier free, Elkay LZSTL8WSSP with 17-gauge P-Trap and rough brass stop. Provide with Zurn Z-1225-BL floor-supported plate carrier and mount in compliance with ADA for handicap use. Unit to have bottle-filling station on lower side.
- P-5 MOP SINK: 32" x 32" x 12", terrazzo, Fiat Stockton TSBC1611 with Fiat 830-AA wall mounted faucet with hose, 889CC bracket, vacuum breaker, stainless steel bumper guard, and stainless steel wall splash guards. Unit shall be provided with 3" drain.
- P-6 KITCHEN HAND SINK: Refer to Kitchen equipment supplier for details. To be provided by others but installed and connected by the plumbing contractor.
- P-7 LAUNDRY SINK: Refer to Kitchen equipment supplier for details. To be provided by others but installed and connected by the plumbing contractor.
- P-8 WASH MACHINE BOX: Guy Gray B-200TS with 2" center set drain and top supply 1/2" angle valves.
- P-9 CAN WASH: J. R. Smith 3370Y can washing floor drain with adjustable spray nozzle and 3380 recessed water supply control box.
- P-10 WORKROOM SINK: Elkay LRAD172065 Stainless steel, counter mounted, single-compartment, 20" x 17" x 6-3/8" deep. Provide T&S B-2866-04 gooseneck faucet (minimum 5" clearance from deck to spray) with wrist blade handles and cup strainer. Bowl depth to be 6-1/2". Provide 1-1/2", 17-gauge P-Trap, continuous waste, and flexible supplies. Provide insulation kit and Leonard model 170D-LF thermostatic mixing valve.

FS-2 FLOOR SINK: Zurn Z1910 8" x 8" x 6" deep with grate cut as needed.

- F. Floor Drains (Typical locations) Zurn ZN-415S Series with polished nickel bronze, square heel-proof strainer and adjustable collar. Floor drains shall be provided with trap primer tap as indicated on plans. (for AHU, equipment area drainage, and dumpster pad) Zurn ZN-415I Series with nickel bronze top and "Type I" polished nickel bronze strainer with raised flange. Floor drains shall be provided with trap guard device, (or equal), as indicated on plans. Floor drains shall be provided with trap primer tap or trap guard device where indicated on plans.

2.10 CLEANOUTS

- A. Provide in cast iron sanitary piping at all changes in direction at ends of branches, at intervals not exceeding 40' on straight runs, and elsewhere as shown. Cleanouts shall be full-opening type completely accessible. Size same as lines in which they occur, but not larger than 4". Tees and extensions shall be of same weight as pipe. Plugs shall be countersunk type. Catalog numbers from Josam or approved equal.
- B. Outside cleanouts to grade shall be brought up flush with finished grade and installed in 18" x 18" x 6" concrete pad, cleanout plug shall be countersunk.
- C. In Tile Floors: 56030-2, adjustable, cast iron body with ABS plug and satin finished square scoriated Nikaloy top; where soft tile occurs, provide 56030-12-2 recessed square Nikaloy cover.
- D. In Concrete Floors: 58190, adjustable head, cast iron head and ferrule with ABS plug, round loose set scoriated tractor cover.
- E. In Outside Line: 58190 cast iron head and ferrule with ABS plug. Terminate at grade or pavement in 18" x 18" x 6" concrete pad with tooled edges.

- F. In Finished Walls: 58790 cast iron cleanout tee with ABS plug and stainless steel wall plate cover. Where distance from plug to finish wall will exceed 4", provide 58710 extend cover from sanitary tee to bring plug within 4".
- G. In Quarry Tile Floors: 56040-13-1, adjustable cast iron head and ferrule, ABS plug and round brass terrazzo cover and rim.

2.11 ELECTRIC TANK-TYPE WATER HEATERS

- A. Provide electric water heater with high efficiency stainless steel sheathed elements which comply with ASHRAE Standard 90-75. Water heaters shall have capacity as scheduled and shall be equal in all respects to Rheem. Provide with 3" diameter thermometer gauge on discharge line, auxiliary drain pan, T&P relief valve, expansion tank, and vacuum breaker.
- B. Provide Watts 100XL temperature and pressure relief valve, Watts N36 vacuum relief valve, galvanized drain pan, and 5-year warranty on tank. Piping is to be copper. See schedule for electrical characteristics.
- C. If the water heater has a storage capacity over 120 gallons or a heating rate of 56kW or greater, a boiler installation permit must be obtained from the State of Alabama Department of Labor. The heater installation and piping must also be inspected and approved by the State of Alabama Department of Labor.

2.12 GAS-FIRED TANKLESS WATER HEATERS

- A. Each tankless water heater shall produce 56°F temperature increase. Each unit shall have a maximum gas consumption of 1,194,000 BTU/H, set discharge temperature for 125°F. Provide MC-601-BK controller and coordinate final location with architect/owner. Tankless water heater shall be equal to Rinnai CU199e. Install per specific manufacturer's recommendation.
- B. Provide Watts's 100XL temperature and pressure relief valve, Watts N36 vacuum relief valve. See schedule for electrical characteristics.

PART 3 - EXECUTION

3.1 COMPLETION OF WORK

- A. This Contractor shall arrange for the installation of all equipment in order that it progresses along with the general construction of the building, and in no case shall be hold up other phases of the work due to the fact his equipment is not properly installed.

3.2 TESTING

- A. General: Perform all tests in the presence of the Architect or his representative. Test shall conform to local code requirements. File copies of all test reports in duplicate to physical plant.
- B. Soil, Waste, and Vent Systems: Plug all openings, fill entire system with water to point of overflow and hold for at least one hour before inspection. System must remain full during the test without leakage. Each vertical stack with its branches may be tested separately, but any portion tested must have a 10' head. Provide test tees and plugs for all tests as required.
- C. Drainage and Vent Systems final test. Fill all traps with water and then introduce into the entire system a pungent, thick smoke produced by one or more smoke machines. When the smoke appears at stack openings on the roof, the stack openings shall be closed and a pressure equivalent to a one-inch water column shall be held for a test period of not less than 15 minutes. The plumbing contractor shall provide all materials, equipment and labor to perform this testing.
- D. Water Supply System: Test and secure acceptance of entire system before the piping or hot water heaters are otherwise concealed. Test as follows: Disconnect and cap all outlets to plumbing fixtures and all other equipment not designed for the full test pressure. Fill the system with water; apply 150 psi hydrostatic pressure and hold until inspection is completed. All piping throughout shall be tight under test. Water piping shall remain under normal water pressure during construction where freezing conditions do not exist.

3.3 DISINFECTION

- A. Disinfect all domestic water piping in accordance with local health department guidelines.

3.4 ATTACHMENTS

- A. General: Contractor to execute originals of attached copies.
- B. Copy of Permit Request to Install Boiler or Pressure Vessel, State of Alabama Department of Labor
- C. Copy of Boiler and Pressure Vessel Inspection Report, State of Alabama Department of Labor

ATTACHMENTS:



JIM BENNETT
COMMISSIONER

Ralph Pate
Chief Inspector
Elevator/Boiler
Safety Division

STATE OF ALABAMA DEPARTMENT OF LABOR

100 NORTH UNION STREET-SUITE 620
P.O. BOX 303500
MONTGOMERY, ALABAMA
ZIP 36130-3500

PHONE (334) 242-3460

FAX (334) 240-3417



Boiler and Pressure Vessel Inspection Report

DATE INSPECTED	CERT. EXP DATE	CERT POSTED YES [] NO []	INVOICE FOR INSP. YES [] NO []	JURISDICTION # AL	Nat'l BD [] or Ser # []
OWNER NAME			NATURE OF BUSINESS		TYPE INSP PERMIT # _____ INT [] EXT []
OWNER STREET ADDRESS AND P.O. BOX			OWNER CITY	OWNER STATE	OWNER ZIP
LOCATION NAME			SPECIFIC LOCATION		OBJECT LOCATION COUNTY
LOCATION ADDRESS LONGITUDE _____ LATITUDE _____			LOC CITY	LOC STATE ALABAMA	LOC ZIP
TYPE BOILER FT _____ WT _____ CI _____ COIL _____ ELECT BLR _____ OTHER _____			MAN HOLE YES _____ NO _____	MANUFACTURER	FUEL N/A _____ FIRING METHOD N/A _____
BOILER USE: Process _____ Hws _____ St Ht _____ Hwh _____ Other _____					
TYPE PRESSURE VESSEL Air _____ Nitrogen _____ Water _____ Autoclave _____ Hot Water _____ Oxygen _____ Heat Exchanger _____ Other _____					
PRESSURE VESSEL USE Process _____ Storage _____ Service _____ Other _____ (explain)					CONTROLS TESTED YES _____ NO _____ N/A _____
DIMENSIONS (length width height etc.) indicate in. and/or ft.			BOILER CAPACITY (indicate ht surface, lbs/h btu/h etc.)		YEAR BUILT
					ASME CODE SYMBOL
MAWP	NO. OF SAFETY-RELIEF VALVES	SAFETY-RELIEF VALVES SET AT	TOTAL SAFETY-RELIEF VALVE CAPACITY, lbs/h btu/h cfm etc.)		PRESSURE GAGE TESTED? YES _____ NO _____
Special Billing Instructions: Send Invoice to: Owner [] Location [] Contact Name _____ Send Certificate to Owner [] Location [] phone number _____					

Violations / required action / compliance date(s)

Fee Schedule:

CERTIFICATE

INSPECTION

Signature of Inspector				Inspector AL CoC #	Company Name	Contact and phone number
I certify this is a true and correct report of my inspection.						

Neither this inspection nor any provision of this inspection shall be construed to place any liability on the state of Alabama, the Inspection Agency/Company or the Inspector with respect to any claim by any person, firm, or corporation relating in any way whatsoever to Boiler Inspections and injury or damage arising there from.
Revised 112807

Site Improvements and Interior Alterations to
Fairhope High School for the
Baldwin County Schools
Fairhope, Alabama

15400-PLUMBING

11

MCKEE PROJECT NO.25.160B



JIM BENNETT
COMMISSIONER

**STATE OF ALABAMA
DEPARTMENT OF LABOR**

100 NORTH UNION STREET-SUITE 620
P.O. BOX 303500
MONTGOMERY, ALABAMA
ZIP 36130-3500

PHONE (334) 242-3460

FAX (334) 240-3417



SAFETY DIVISION
CHIEF
RALPH PATE

Permit Request to Install Boiler or Pressure Vessel
(ONE OBJECT PER REQUEST WITH \$ 50.00 FEE)

Type of Installation	New ☐	Used ☐
Type of Object	Boiler ☐	Water Heater ☐
		Pressure Vessel ☐ (storage tanks)

Installer
Address 1 _____
City / Zip _____
Contact Name _____
Phone Number _____

Loc of Installation
Address 1 _____
City / Zip _____
Contact Name _____
Phone Number _____

Purchased From (Co. Name, address, contact and ph#)	
Manufacturers Name	
National Board Registration # All objects must be NB registered by the Mfg. except cast Iron or cast aluminum sectional boilers)	
MAWP (max allowable working pressure indicated on Mfg Data Plate)	
Indicate the appropriate ASME Code Symbol Stamp as indicated on Mfg's Data Plate (all boilers and Pressure vessels must be ASME code constructed, and will have one of these stamps on nameplate attached to the shell.	S ☐ Power Boiler (over 15 psi steam) HLW ☐ Water Heaters (over 200,000btu and/or 120 gals) H ☐ Heating Boilers/Hot Water Supply Boilers M ☐ Miniature Boiler (not to exceed 100 psi steam) U ☐ Unfired pressure vessel/Storage Tank Note: Water Heaters are classified as a boiler.
Serial Number	

Signature of Applicant _____

OFFICIAL USE ONLY	
Approved by: _____	Check No. _____
Permit Number _____	Date ____/____/____
This Permit expires one year from the date signed by the Department or when installation is complete. Revised 11/28/2007	

Site Improvements and Interior Alterations to
Fairhope High School for the
Baldwin County Schools
Fairhope, Alabama

15400-PLUMBING
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MCKEE PROJECT NO.25.160B

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END OF SECTION**

SECTION 15510 - FIRE PROTECTION SYSTEM

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials, tools equipment, and perform all work and services necessary for or incidental to the design and installation, complete, of an approved fire protection system which shall be completely coordinated with the work of all other trades. All work shall be performed by an automatic sprinkler contractor licensed in the State of Alabama who shall certify the complete installation.
- B. Although such work is not specifically shown or specified, all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a complete and operable installation shall be furnished and installed as part of this work.
- C. Shop drawings for the fire protection sprinkler system shall be submitted as signed and sealed documents by the contractor. Engineer of record shall be licensed in the State of Alabama.
- D. The Contractor shall comply with all county, district, municipal, or local building codes, interpretations, buildings permits to include but not be limited to the latest editions of:
 - 1. International Building Code – 2021
 - 2. International Plumbing Code – 2021
 - 3. International Mechanical Code – 2021
 - 4. International Fire Protection Code – 2021
 - 5. NFPA-13 - Installation of Sprinkler System
 - 6. NFPA-90A - Installation of Air Conditioning and Ventilation Systems
 - 7. NFPA-101 - Life Safety Code
 - 8. Local Municipal Codes

1.2 DESCRIPTION OF WORK

- A. Work included in this section of the specifications shall consist generally of, but is not limited to, the following major systems or categories of work:
 - 1. The work includes the hydraulic design and installation of an automatic wet pipe fire extinguishing sprinkler system for for the entire building. Wet pipe protection shall be for all piping located in the occupied space. It is intended the wet piping protect area below the ceiling. The wet piping shall be located as close to ceiling as possible to allow for ceiling insulation to cover wet pipe system. The design, equipment, materials, installation and workmanship shall be in strict accordance with the required and advisory provisions of NFPA 13, except as modified herein. System shall include all materials, accessories, and equipment necessary to provide an automatic system which is complete and ready to use. Design and install system to give full consideration to lighting blind spaces, piping, electrical equipment, ductwork, and all other construction and equipment to afford complete coverage in accordance with prevailing code requirements.

1.3 FIRE PROTECTION SYSTEM CONTROLS

- A. Devices and equipment for fire protection service shall be of an approved make and type listed by the Underwriter's Laboratories, Inc., or approved by the Factory Mutual System.

1.4 SPRINKLED CODES AND STANDARDS

- A. Entire system shall be hydraulically designed and installed in accordance with the following codes and standards for the occupancy hazards as hereinbefore specified.
- B. Standards of the National Fire Protection Association: Chapters No. 13 and No. 24.
- C. A new fire service main including excavation and connection where indicated.

- D. Requirements of the fire inspection bureau having jurisdiction.
- E. International Building Code.

1.5 INSTALLATION

- A. Furnish and install a complete fire protection system in accordance with this specification and as required by state and local governing codes.
- B. System shall consist of connection to water service, valves, piping, all underground piping to sprinkler system. Provide sleeves at all floor and wall penetrations.
- C. The Contractor shall conduct a flow test to insure available flow and pressure at point of connection. The system classification shall be for light/ ordinary hazard occupancy with risers to protect the facility. Should particular areas of the facility be classified other than as indicated coordinate with Engineer.
- D. Flow test data shall be verified at the project site prior to beginning work.
- E. Fire protection contractor shall coordinate installation of site utility piping with civil contractor to ensure a complete and operational system. A remote fire department connection shall be indicated on the backflow preventer as provided and installed by others.
- F. Design and installation of the sprinkler system shall be such that it is entirely drainable.

1.6 SUBMITTALS

- A. Submit a 1/8" = 1'-0" minimum scale reproducible shop drawing in accordance with NFPA #13 to the Architect. Verify all clearances, lighting fixtures, piping, etc., at job site or from contract documents.
- B. Approval by Architect will be for general location only. Where there is conflict between authority's recommendations and these drawings and specifications, recommendations by the authority shall govern. All drawings shall be signed, sealed and submitted by a fire protection engineer registered in the State of Alabama.
- C. Submit to Architect for approval actual photographs or samples of all items of equipment which will be visible with the finished work. Include such items as Siamese connections, valves, flow switches, sprinkler heads, etc.

PART 2 - PRODUCTS

2.1 MATERIALS SPECIFICATIONS

- A. All material and equipment shall be furnished by an established and reputable manufacturer. All material and equipment shall be new, unused, and of first class construction designed and guaranteed to perform the services required and shall be approved by NFPA and UL.
- B. Underground pipe shall be black steel. All joints under the slab and to 5 feet outside of the building shall be welded. Likewise this same piping shall be mil wrapped for corrosion protection.
- C. Above grade, piping shall be black steel, Schedule 10 for sizes 2½" and larger; ASTM A135. Fittings shall be UL and FM approved mechanical couplings. Piping 2" and smaller shall be Schedule 40 black steel with 175 lb. screw pattern fittings.
- D. Provide thrust restraints where steel piping is connected to cast iron.
- E. All piping exposed to view shall be painted before final acceptance by Owner. Remove all rust, scale, dirt, etc., and prime and finish with red pipeline enamel.

2.2 PIPE HANGERS

- A. Pipe hangers shall be spaced in accordance with requirements of NFPA or as specified in plumbing section, whichever is stricter. Hangers, hanger rods, inserts and clamps shall be constructed as approved by same. Hangers shall be same type as specified in plumbing section, however, shall be zinc coated for corrosion protection.

2.3 DRAINS

- A. Install approved drains at low points of all piping and elsewhere as required to permit complete drainage of system without disconnection of any piping. Drain and test connections on end of sprinkler branches shall be piped to exterior of building.
- B. Coordinate location of drains with Architect before installation. Submit locations on shop drawings. Install all drains in walls adjacent to exterior wall and provide lockable access panel for drain valve.

2.4 VALVES

- A. Only approved OS&Y as required by Underwriters' Laboratories and NFPA shall be used. Check valves shall be approved by NFPA. Test and drain valves and hangers shall be approved and shall conform to requirements of NFPA. All OS&Y valves used in fire protection system shall have provisions for tamper switches. (Tamper switches shall be furnished and installed by the fire protection contractor and wired by the electrical contractor).

2.5 BALL DRIP

- A. Install ball drips at each location shown on plans or where required. Ball drips to be 1/2" size, Elkhart No. 701 or equal.

2.6 SIAMESE CONNECTIONS

- A. Provide and install as shown on drawings two-way Siamese connection with a 4" x 2½" x 2½" cast brass angle body with chrome plated connections. On face of Siamese shall be written the words "Automatic Sprinkler". Automatic ball drip and check valve shall be UL and NFPA pamphlet No. 14 approved. Threads on each Siamese shall meet local fire department requirements. Siamese connections shall be provided remote from building as shown on civil drawings. Provide brass plugs and chain with entire assembly, chrome plated finish. Unit shall be Elkhart 156 with dependent drop clapper valves. Acceptable manufacturers: Potter-Roemer and Croker-Standard. Plastic dust covers on connections shall not be used.
 - 1. Ensure installation of this connection is within 100 feet of the nearest fire hydrant. Coordinate final location of fire hydrant with site utility contractor.

2.7 SPRINKLER HEADS

- A. Install all sprinkler heads as required by NFPA No. 13. Heads shall be rated for various temperatures and flows as determined by National Fire Protection Association. In no case shall they be rated at less than 155°F.
- B. Furnish spare sprinkler heads and wrench as required by NFPA and place in metal cabinet on job site where directed by Architect.
- C. Furnish an emergency rubber ball shutoff with 36" long handle to be used for temporary closing of sprinkler heads.
- D. Sprinkler heads shall be of type and operating temperature as required by specific location of installation. Sprinkler heads to be sidewall mounted shall be in accordance with governing codes.
- E. All sprinkler heads in finished areas with lay-in acoustical ceilings shall be recessed type covered by white metal plates. Sprinkler heads in plaster or hard finished ceilings shall be semi recessed and have chromium plated finish. Sprinkler heads shall be equal to those manufactured by Grinnel, Automatic Sprinkler, or Viking.
- F. Sprinkler heads located in corridor shall be located at the center of the corridors and at the center of the ceiling tile in which located.

2.8 SPACE LIMITATIONS

- A. Route piping to avoid interferences with ducts, piping, lighting, etc. Necessary offsets, crossover or other routing shall be provided to permit all systems to be installed in available space. Offsets, crossovers, etc., are not shown on drawings. Investigate mechanical, electrical, and architectural

drawings to ascertain how work of other trades affect installation.

2.9 FLOW SWITCHES

- A. Install UL approved flow switches and alarm devices where shown or required. Flow switches shall be Autocall, Notifier with electrical rating for pilot duty only. Switches shall be suitable for working pressures of 150 psi with adjusting screw to provide sensitivity. Wiring from flow switches to fire alarm system provided under another section. Switch shall have contacts required for interconnection to the fire alarm system.

PART 3 - EXECUTION

3.1 TESTS AND INSPECTION

- A. Work included herein shall include all tests and inspections by State authority and/or Local Fire Marshall and all permits or inspection fees connected therewith. At completion of work and prior to acceptance by Owner, demonstrate complete operation of system including alarms.

3.2 DRAWINGS

- A. Drawings are diagrammatic only. Field route all piping on job site. All piping in finished spaces shall be run concealed.

3.3 COORDINATION

- A. Sprinkler contractor shall coordinate with utility the requirements of pressure and water supply for satisfactory operation of this system.

END OF SECTION

SECTION 15800 - HEATING, VENTILATION AND AIR CONDITIONING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The General Conditions, Supplementary Conditions and Division 1, General Requirements, apply.

1.2 CODES, FEES, PERMITS

- A. The Contractor shall comply with all county, district, municipal, or local building code, interpretations, building permits and assessments of fees for building permits, and ordinances.
- B. The Contractor shall obtain and pay for all required permits, inspections, and certificates of inspection. Certificates of inspection shall be delivered to the Architect upon completion of the job.
- C. The Contractor shall comply with the latest revisions of all county, district, municipal, or local building codes, interpretations, buildings permits to include but not be limited to:
 - 1. ASHRAE, 2012 "HVAC Systems and Equipment" - Chapter 19, Duct Construction SMACNA Standards for Duct Construction
 - 2. International Building Code – 2021
 - 3. International Mechanical Code – 2021
 - 4. International Plumbing Code – 2021
 - 5. International Fuel Gas Code – 2021
 - 6. ASHRAE 90.1
 - 7. ASHRAE 62.1
 - 8. NFPA-90A - Installation of Air Conditioning and Ventilation Systems
 - 9. NFPA-101 Life Safety Code
 - 10. Local Municipal Codes

1.3 RELATED WORK SPECIFIED ELSEWHERE IN THE SPECIFICATIONS

- A. General Requirements for Mechanical Work - Section 15100.
- B. Test and Balance - Section 15200.
- C. Plumbing - Section 15400.
- D. Temperature Control System – Section 15900.
- E. Energy Management Control System and Direct Digital Controls – Section 15950.
- F. Commissioning of HVAC Systems - Section 15995
- G. Electrical - Division 16000.

1.4 RESPONSIBILITY OF BIDDER

- A. Each bidder shall visit the site of the proposed work and fully acquaint himself with conditions relating to the construction requirements so that he may fully understand the facilities, difficulties and restrictions contingent upon the execution of the work under this contract. The failure or omission of any bidder to receive or examine any form, instrument, addendum or other document shall in no way relieve any bidder from his obligations with respect to his bid or the contract. The submission of a bid shall be taken as prima facie evidence of compliance with this paragraph and that he has included in his proposal every item of cost necessary for a complete installation of air conditioning, heating and ventilation operations strictly as planned, specified, and intended.

1.5 SUB-DIVISIONS OF WORK

- A. Each sub-division of work includes furnishing and installing all materials to make that part of work complete, and shall comprise all auxiliaries, setting of equipment, sleeves through building construction where required and etc., all in complete coordination with General Contractor and in cooperation with other trades. It is contemplated that all sub-divisions of work when completed will form heating, air conditioning, and ventilation system for this project.

1.6 DRAWINGS

- A. The drawings for the Heating, Ventilating and Air Conditioning for this job are diagrammatic. The Contractor shall make his own measurements at the site and in the buildings during construction and install the systems as the work progresses in such a manner that the equipment, piping, conduit, panels, and ductwork will fit into the finished space provided maintaining headroom and maintenance accessibility; and be neatly installed.
- B. Contractor shall provide all fittings and accessories as necessary for a complete installation, whether or not specifically mentioned or shown.

1.7 FOUNDATIONS

- A. The Contractor shall furnish all special foundations and supports for air devices and ductwork which he installs.

1.8 SAFETY PROVISIONS

- A. Contractor shall be required at all times to perform his work in strict accordance with the Williams-Steiger Occupational Health and Safety Act of 1970.

1.9 NOISE AND VIBRATION

- A. This Contractor shall be held responsible for elimination of all noises or vibrations transmitted to occupied areas from air devices and ductwork which he may install. This applies particularly to airborne noises in ductwork.

1.10 PAINTING

- A. Any air device finish that is damaged or chipped, shall be spot painted to match existing surface. Any rusty or corroded finishes shall be thoroughly cleaned and painted two coats of paint - one prime and one finish coat.

1.11 TESTS AND GUARANTEES

- A. After completion of his work, and when the building is ready for occupancy, this Contractor shall operate the air conditioning or heating system for a period of two days. During the tests, the Contractor shall adjust outlets, etc.
- B. The Contractor shall repeat operational sequence during heating and/or cooling season, whichever had not been subject to prior test period.

1.12 SHOP DRAWINGS

- A. Materials and equipment schedules shall be submitted (at least one hard copy) as soon as practicable but not later than thirty (30) days after the date of award of contract, and before commencement of installation of any material or equipment. A complete schedule of the material and equipment proposed for installation shall be submitted for approval. The schedule shall include catalogs, cuts, diagrams, drawings, specifications and such other descriptive data as may be required by the Engineer. All materials required to be submitted for approval under this section shall be submitted at one time. Partial submittals will not be considered. They will be returned as "not approved".
- B. Shop drawings shall be submitted for approval on the following items of equipment. Subject drawings shall include all data pertinent to the performance and installation of all equipment.
 - 1. Air Distribution Devices - Grilles, Registers, Diffusers, Dampers
 - 2. Ductwork

3. Insulation Materials
4. Packaged Roof Mounted Direct Expansion Air Conditioning Equipment
5. Packaged Roof Mounted Direct Expansion 100% Outdoor Air Unit
6. Fans
7. Filters
8. Temperature Controls
9. Air Terminal Unit(s)

1.13 QUALITY OF MATERIALS AND EQUIPMENT

- A. It is not the intent of these specifications to limit material and/or equipment selections to one manufacturer; however, the Engineer reserves the right to be the final and sole judge with regard to equals.
- B. Approvals of equipment are based on capacities, equality of workmanship and components, or general and special construction features. Approval of equipment does not relieve the Contractor of coordination responsibility with other trades.

1.14 SUBMITTALS

- A. Product Data: Submit manufacturer's latest published product data for all materials for approval. See Section 15100.

1.15 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver distribution devices in individual wrappings to prevent damage to finish surface of device. Store in a dry, protected area until installed. After installation of devices, clean soiled finishes.

PART 2 - PRODUCTS

2.1 PACKAGED AIR CONDITIONING UNITS WITH ELECTRIC HEATING

- A. General
 1. Equipment installation shall include but not limited to:
 - a. Package frame supported unit.
 - b. Heat exchanger.
 - c. Refrigeration components.
 - d. Unit operating controls.
 - e. Electrical power connections.
 - f. Operation and maintenance service.
 2. References
 - a. ANSI/NFPA 90A - Installation of Air Conditioning and Ventilation Systems.
 - b. AHRI 360 - Unitary Air-Conditioning Equipment.
 - c. ANSI/ASHRAE/IESNA 90.1-1999 - Energy Standard for New Buildings Except Low-Rise Residential Buildings.
 3. Handling
 - a. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.
 - b. Protect units from physical damage. Leave factory shipping covers in place until installation.
 4. Warranty

- a. Provide a full parts, labor, and refrigerant warranty for 60 months from start-up or 66 months from shipment, whichever occurs first.
5. Summary
 - a. The contractor shall furnish and install package pad mounted air conditioning unit(s) as shown and scheduled on the contract documents. The unit(s) shall be installed in accordance with this specification and perform at the specified conditions as scheduled.
- B. General Unit Description
 1. Unit(s) furnished and installed shall be packaged pad mounted as scheduled on contract documents and these specifications. Cooling performance shall be based on AHRI testing procedures. Wiring internal to the unit shall be numbered for simplified identification. Units shall be cULus listed and labeled, classified in accordance with cULus for Central Cooling Air Conditioners. Unit(s) shall be factory assembled, internally wired, fully charged and consist of insulated weathertight casing with compressors, air cooled condenser coil, condenser fans, evaporator coil, filters, supply and/or exhaust motors and drives, unit controls and heat as scheduled.
 2. Unit(s) shall have labels, decals, and/or tags to aid in the service of the unit and indicate caution areas.
 3. Unit Casing
 - a. Cabinet: Galvanized steel, phosphatized, and finished with a pre-applied baked polyurethane enamel. Cabinet surface shall be tested 672 hours in salt spray in compliance with ASTM B117. Fully gasketed removable access panels with hinges. Structural members shall be heavy gauge with access doors and removable panels of heavy gauge. Provide 1/2 inch thick foil faced fiberglass insulation on all exterior panels and roof in contact with the return and conditioned air stream. Cabinet top cover shall be one piece construction or where seams exits, it shall be double hemmed and gasket sealed.
 4. Electrical Power Connections
 - a. Factory-made penetrations shall be provided for connection of all electrical wiring. These wiring provisions shall be through the side of the cabinet. Field penetrations of the unit base pan shall not be acceptable.
 - b. Unit shall include a phase monitor as standard that protects equipment from phase loss, phase reversal, and low voltage. Any fault condition shall produce a Failure Indicator LED, and send the unit into an emergency stop condition. The entire unit with this option shall be cULus approved. If not, a field UL inspection is required.
 - c. Provide factory installed disconnect and powered GFCI outlet. The unit must have factory furnished and installed transformer for the GFCI outlet. If a field wired outlet is supplied, then the installing contractor will be responsible for the additional cost of the electrical runs.
 5. Air Filters: Filters shall mount integrally within unit and be accessible through hinged access panels. Filters shall be minimum of 4" thick and MERV8.
 6. Fans - Supply
 - a. Provide forward-curved fan mounted with fixed pitch sheave drive assembly. Complete fans assemblies shall be statically and dynamically balanced.
 - b. Fan shaft shall be mounted on grease lubricated ball bearings. All motors shall be circuit breaker protected. Fans shall be controlled as Single Zone Variable Air Volume with a full VFD with bypass. No two speed or four speed fan options will be accepted as alternatives.
 7. Electric Heating Section: Electric resistance heaters shall be furnished and factory-installed within the unit with capacity as scheduled and shall be UL approved.

8. Evaporator Coil

- a. Provide heavy duty aluminum fins mechanically bonded to internally enhanced, copper tubes.
- b. Provide a thermostatic expansion valve for each refrigeration circuit. All coils shall be leak tested at the factory to ensure pressure integrity. The evaporator coil is pressure tested to 450 psig.
- c. Unit shall include a Condensate Overflow Switch to shut the unit down in the event that a clogged condensate drain line prevents proper condensate removal from the unit.
- d. Unit shall include Sloped Stainless Steel evaporator coil drain pans that are durable, long-lasting and highly corrosion resistant.

9. Condenser Section

- a. Provide all Aluminum Microchannel epoxy coated condenser coils. All condenser coils shall be leak tested at the factory to ensure pressure integrity and pressure tested to 650 psig.
- b. Condenser Coating must be Factory applied to withstand ASTM B117 Salt Spray test for 6000 hours and ASTM G85 A2 Cyclic Acidified Salt Fog test for 2400 hours. To provide optimal protection in more corrosive environments, coating shall cover all tubes, headers and fin edges.
- c. Provide integral subcooling circuit(s) to prevent premature refrigerant flashing and to insure maximum operating efficiency.
- d. Provide horizontal discharge, direct drive fans with steel blades, and three phase motors. Fans shall be statically balanced. Motors shall be permanently lubricated, with built-in current and thermal overload protection in a weathertight casing.
- e. Provide tool-less factory installed corrosion resistant louvered hail/vandalism guards to protect condenser coils from hail or physical damage. Wire mesh coil guards shall not be acceptable.

10. Refrigeration System - R454B refrigerant

- a. Provide with thermostatic temperature motor winding control for protection against excessive temperatures caused by over-/under voltage operation or loss of charge. Also provide high and low pressure cutouts.
- b. Provide a minimum of 5 stages of cooling or variable speed compressor control.
- c. Refrigeration system shall include a reheat condenser factory installed downstream of the unit evaporator coil. Modulating valves shall control the flow of refrigerant between the indoor reheat and outdoor condensers in response to the unit discharge air temperature in order to dehumidify the space during low load conditions.

11. Outdoor Air Section

- a. Provide a fully integrated factory installed 100% modulating outside air economizer with unit return and barometric relief air dampers. Economizer operation shall be through microprocessor based primary temperature controls that automatically modulate dampers to maintain space temperature conditions.
- b. Provide economizer with differential enthalpy controls factory installed.
- c. Provide spring return motor for outside air damper closure during unit shutdown or power interruption.
- d. Provide integrated CO2 based demand control ventilation utilizing space/duct CO2 sensors (as shown on plans) with sensor and control boards provided by RTU manufacturer.
- e. The unit shall include a room humidity sensor to monitor and control to maintain a space humidity of 50% RH at the scheduled setpoint.

C. Unit Controls

1. General: Microprocessor controls shall be provided for all 24 volt control functions. The resident control algorithms shall make all heating, cooling and/or ventilating decisions in response to electronic signals from sensors measuring indoor and outdoor temperatures. The control algorithm maintains accurate temperature control, minimizes drift from set point and provides better building comfort. A centralized microprocessor shall provide anti-short cycle timing and time delay between compressors to provide a higher level of machine protection.
2. Variable Air Volume Controls: Provide all necessary controls to operate a Single zone VAV rooftop from supply air temperature including supply air microprocessor controller, and supply air sensor. The microprocessor shall coordinate the economizer control and stages of cooling with supply air temperature reset capability based upon return temperature.
3. The following setpoints shall be accessible in the unit control panel: supply air cooling setpoint, morning warmup setpoint, reset setpoint, reset amount.
4. Compensated Outside Air Control - shall be provided to control outside air damper positioning, maintaining minimum outside air requirements, during operation of variable air volume (VAV) systems.
5. Clogged filter indication: Provide factory installed differential pressure switch to indicate filter replacement status. Differential pressure switch shall cause a contact closure to display a service indication and unit will continue to operate normally.

D. Building Management System

1. Control Functions: Include unit scheduling, occupied/unoccupied mode, start-up and coast-down modes, nighttime free-cool purge mode, demand limiting, night setback, discharge air set point adjustment, timed override and alarm shutdown.
2. Remote Monitoring: BAS system shall include modem to provide remote dial in and dial out capabilities.
3. Diagnostic Functions shall include: Unit operating mode, Unit failure status, cooling failure, emergency service stop indication, supply fan proving, timed override activation, high temperature thermostat status, Zone temperature, Supply air temperature, Cooling status (all stages), Stage activated or not, Stage locked out by UCP, HPC status for that stage, Compressor disable inputs, Number of stages activated, High temperature limit status, Economizer status, Enthalpy favorability status, Requested minimum position, Damper position, Dry bulb/enthalpy input status, Outside air temperature, Outside relative humidity,
4. Sensor Failure: Humidity sensor, OAT sensor, SAT sensor, RAT sensor, Zone temperature sensor, Mode input, Cooling setpoints from sensors (CV only), Static pressure transducer, Unit mounted potentiometer, SAT from potentiometer (VAV only), Air reset setpoint from potentiometer (VAV only), Unit Configuration data, Gas or electric heat, Economizer present, High temp input status, Local setpoint, Local mode, Inlet Guide Vane position/VFD %.
 - a. Unit operating mode
 - b. Unit failure status
 - c. Cooling failure
 - d. Emergency service stop indication
 - e. Supply fan proving
 - f. Timed override activation
 - g. High temperature thermostat status
 - h. Zone temperature
 - i. Supply air temperature
 - j. Cooling status (all stages)

- k. Stage activated or not
 - l. Stage locked out by UCP
 - m. HPC status for that stage
 - n. Compressor disable inputs
 - o. Number of stages activated
 - p. High temperature limit status
 - q. Economizer status
 - r. Enthalpy favorability status
 - s. Damper position
 - t. Outside air temperature
 - u. OAT sensor (Fail/Normal)
 - v. SAT sensor (Fail/Normal)
 - w. RAT sensor (Fail/Normal)
 - x. Zone temperature sensor (Fail/Normal)
 - y. Mode input (Fail/Normal)
 - z. Cooling/heating setpoints from sensors (CV only) (Fail/Normal)
 - aa. Static pressure transducer (Fail/Normal)
 - bb. Unit mounted potentiometer (Fail/Normal)
 - cc. SAT from potentiometer (VAV only) (Fail/Normal)
 - dd. Air reset setpoint from potentiometer (VAV only) (Fail/Normal)
 - ee. Unit Configuration data
 - ff. Gas or electric heat
 - gg. Economizer present
 - hh. High temp input status
 - ii. Local setpoint
 - jj. Local mode
5. Provide capabilities for Boolean Processing and trend logs as well as "templated" reports and logs.

E. Installation

- 1. Install in accordance with manufacturer's instructions.
- 2. Mount units on factory built roof mounting frame providing watertight enclosure to protect ductwork. Install roof mounting curb level.

F. Manufacturer's Field Services

- 1. Manufacturer shall furnish a factory trained service engineer without additional charge to start the unit(s). Package rooftop unitary manufacturers shall maintain service capabilities no more than 50 miles from the jobsite.
- 2. The manufacturer shall furnish complete submittal wiring diagrams of the package unit as applicable for field maintenance and service.

2.2 ROOF MOUNTED PACKAGED 100% OUTDOOR AIR PRE-CONDITIONING AIR CONDITIONING UNIT

A. Manufacturers

Site Improvements and Interior Alterations to
Fairhope High School for the
Baldwin County Schools
Fairhope, Alabama

15800-HEATING, VENTILATION AND AIR
CONDITIONING

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1. Available Manufacturers: Subject to compliance with specifications contained within this document, manufacturers offering products that may be incorporated into the work include, but are not limited to:
 - a. Captive Aire
 - b. Approved equal

B. Manufactured Units

1. Unit with Integral Indirect Packaged DX Cooling shall be fully assembled at the factory and consist of an insulated metal cabinet, louvered outdoor air intake with aluminum mesh, motorized intake damper, filter assembly for intake air, packaged DX cooling system, condensate drain pan, P trap, sensors, supply air blower assembly, and electrical control unit with all specified components and internal accessories factory installed and tested and prepared for single-point high voltage connection. Airflow arrangement shall be Outdoor Air only. Unit shall be constructed in a horizontal configuration.
2. Certifications
 - a. Entire unit shall be ETL Certified per U.L. 1995 and bear an ETL mark.
 - b. Coils shall be Recognized Components for ANSI/UL 1995, CAN / CSA C22.2 No 236.05. Cooling coils shall be AHRI Certified per standard 410-2001.

C. Cabinet

1. Materials: Formed, double wall insulated metal cabinet, fabricated to permit access to internal components for maintenance.
 - a. Outside casing: 18 gauge, galvanized (G90) steel meeting ASTM A653 for components that do not receive a painted finish. Pre-painted components as supplied by the factory shall have polyester urethane paint on 18 gauge G60 galvanized steel. Base rail is 12 gauge, galvanized (G90) steel.
 - b. Internal Assemblies: 24 gauge galvanized (G90) steel except for motor supports which shall be minimum 14 gauge galvanized (G90) steel.
2. Comply with NFPA 90A and NFPA 90B and erosion requirements of UL 181.
 - a. Materials: Fiberglass insulation. Insulation other than fiberglass must also meet the Fire Hazard Classification shown below.
 - Thickness: 1 inch (25 mm)
 - Fire Hazard Classification: Maximum flame spread of 25 and smoke developed of 50, when tested in accordance with ASTM C 411.
 - Location and application: Floor of each unit shall be insulated with 1 inch thick rigid fiberglass insulation, covered on one surface with integral aluminum foil.
3. Access panels: Unit shall be equipped with hinged access panels to provide easy access to all major components.
4. Supply Air blower assembly: Blower assembly consists of an electric motor and a belt driven, double width, double inlet forward curve blower. Assembly shall be mounted on heavy gauge galvanized rails and further mounted on minimum 1.125 inch thick neoprene vibration isolators.
5. Control panel / connections: Unit shall have an electrical control center where all high and low voltage connections are made. Control center shall be constructed to permit single-point high voltage power supply connections.
6. Condensate drain pan: Drain Pan shall be an integral part of the Make-Up Air Unit. Pan shall be formed of welded stainless steel sheet material and provided with a welded stainless steel drain connection at the front for connection to a P trap. Drain pan shall be sloped in two directions to provide positive draining and drain connector shall be sealed at penetration through cabinet wall.

7. P trap: Contractor shall provide, or fabricate, and install an appropriate P trap, in accordance with all local and area codes and Best Practices.
8. Packaged DX: Unit shall be equipped with a Packaged DX system to include compressor(s), evaporator and condenser coil(s), condenser fans and all appurtenant controls as specified elsewhere in this section. The Packaged DX system is to be an integral module, incorporated into the unit. Stand-alone Packaged DX systems that are connected to the MAU, or systems that require hardware or equipment that is not integral to the MAU are not acceptable.
9. Dampers: Motorized Intake Air dampers of low leakage type shall be factory installed.
10. Sensors are considered to be part of various optional operational modes or device controllers and are to be factory supplied and installed.

D. Blower

1. Blower section construction, Supply Air: Belt drive motor and blower shall be assembled onto a minimum 14 gauge galvanized steel platform and must have neoprene vibration isolation devices, minimum of 1 - 1/8 inches thick.
2. Blower assemblies: Shall be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and horsepower.
3. Centrifugal blower housing: Formed and reinforced steel panels to make curved scroll housing with shaped cutoff.
4. Forward curved blower (fan) wheels: Galvanized or aluminum construction with inlet flange and shallow blades curved forward in direction of airflow. Mechanically attached to shaft with set screws.
5. Blower section motor source quality control: Blower performance shall be factory tested for flow rate, pressure, power, air density, rotation speed and efficiency. Ratings are to be established in accordance with AMCA 210, "Laboratory Methods of Testing Fans for Rating".

E. Motors

1. General: Motors shall be heavy-duty, permanently lubricated type to match the fan load and furnished at the specified voltage, phase and enclosure. Drives shall be sized for a minimum of 150% of driven horsepower and pulleys shall be fully machined cast-type, keyed and fully secured to the fan wheel and motor shafts. Electric motors of ten horsepower or less shall be supplied with an adjustable drive pulley.
2. Motors shall be as scheduled.

F. Unit Controls

1. The unit shall be constructed so that it can function as a stand-alone cooling system controlled by factory-supplied controllers, thermostats and sensors and it be monitored as a cooling only system.
2. Sensors to be provided with the unit include:
 - a. Cooling Inlet Air Sensor

G. Filters - Unit shall have 2" thick MERV 8 disposable pleated filters located in the outdoor air intake and shall be accessible from the exterior of the unit.

H. Installation - Installation shall be accomplished in accordance with these written specifications, project drawings, manufacturer's installation instructions as documented in manufacturer's IOM, Best Practices and all applicable building codes.

I. Connections

1. Connections are to be made subject to the installation requirements shown above.
 - a. Ductwork installation requirements are specified in Section 15800 (HVAC). Drawings indicate general arrangement of ductwork, fittings and specialties.
 - b. Electrical installation requirements are specified in Section 16000 of this document.

- J. Field Quality Control - Manufacturer's Field Service: Engage a factory authorized service representative to inspect field assembled components and equipment installation, to include electrical and ductwork connections. Report results to A/E in writing. Inspection must include a complete startup checklist to include (as a minimum) the following: Completed Start-Up Checklists as found in manufacturer's IOM.
- K. Start-Up Service - Engage a factory authorized service representative to perform startup service. Clean entire unit, comb coil fins as necessary, and install clean filters. Verify air source for compliance with manufacturer's requirements for flow and temperature. Measure and record electrical values for voltage and amperage. Refer to Section 15200 "Testing, Adjusting and Balancing" and comply with provisions therein.
- L. Demonstration and Training - Engage a factory authorized service representative to train owner's maintenance personnel to adjust, operate and maintain the entire Make-Up Air unit.

2.3 AIR CONDITIONING SYSTEM FILTRATION

- A. It is the mechanical contractors responsibility to insure the inside of each air handling unit with associated air distribution system is kept cleaned and not allow construction dust to infiltrate the system. Should the system become contaminated as determined by Architect, Engineer and Owner the mechanical contractor shall be responsible for cleaning. The mechanical contractor shall take any precautions necessary to prevent construction duct from entering the system which shall include as a minimum:
- B. Prior to activating the air conditioning system for building finish work all filters shall be installed in each air handling unit.
- C. The mechanical contractor shall maintain clean filters at all times. Regular filter replacement is recommended.
- D. Prior to the owner taking possession of the building all filters in each air handling unit shall be replaced new. One complete set of replacement filters for each air handling unit shall be turned over to owner for future installation.
- E. At no time are any air handling units to be operated without air filters. Return grilles are to be covered with filter media during construction when units are in operation.

2.4 AUTOMATIC SHUT-DOWN

- A. Air conditioning equipment shall have smoke detectors installed in supply air and return air duct. Mechanical contractors shall install smoke detectors provided by electrical contractor under Division 16000. Smoke detectors shall be for automatic shut down of unit.

2.5 INDOOR AIR QUALITY MONITOR

- A. The Indoor Air Quality (AQ) Monitor continually monitors the levels of carbon dioxide (CO2) and volatile organic compounds (VOCs) for an overall indication of IAQ. The monitor shall be capable of monitoring VOC components and the CO2 level for an IAQ output. The combined output is designed to indicate information about the quality of the air. Monitor shall be equal to Specialty Sensors MSA Airox Monitor Model 711271.

2.6 DRAIN CONNECTIONS

- A. Provide drain connection with 2" seal trap for all cooling at air handling units. Drain piping shall be copper Type "L" with drainage pattern fittings and soldered joints insulated with 3/8" wall closed cell elastomeric insulation slipped over piping. Slope piping at 1/4" per foot to nearest floor drain. Refer to piping plans for location of floor drains.

2.7 KITCHEN HOOD EXHAUST FAN (ROOF MOUNTED)

- A. Spun steel exhaust fans shall be centrifugal belt driven type. Fan wheel shall be centrifugal backward inclined type. The wheel shall be constructed of steel and coated with a non stick coating similar to Teflon[®] as manufactured by Dupont. Wheel shall include a wheel cone carefully matched to the inlet cone for precise running tolerances. Wheels shall be statically and dynamically balanced.

- B. The fan housing shall be constructed of 16 gauge galvanized steel with a rigid internal support structure and shall be leakproof. The fan housing shall be constructed with a one piece windband with an integral rolled bead for added strength and shall be joined to the curbcap with a continuous robotically welded seam.
- C. Fan's windband shall have a Clean Out Port, a 4 inch diameter hole on the outside of the fan's windband with a grease repellent compression rubber fit, allowing access to entire wheel for cleaning.
- D. Motors shall be heavy duty ball bearing type, carefully matched to the fan load, and furnished at the specified voltage, phase and enclosure. Drive frame assembly shall be constructed of heavy gauge galvanized steel. Motors and drives shall be mounted on heavy duty true vibration isolators, out of the airstream. Fresh air for motor cooling shall be drawn into the motor compartment through a ten square inch tube free of discharge contaminants. Motors and drives shall be readily accessible for maintenance.
- E. Precision ground and polished 1 inch minimum diameter fan shafts shall be mounted in cast pillow block lubricatable ball bearings. Bearings shall be selected for a minimum L10 life in excess of 100,000 hours at maximum cataloged operating speed. Dual drives shall be sized for a minimum of 150% of driven horsepower. Pulleys shall be of the cast type, keyed and securely attached to the wheel and motor shafts.
- F. Motor pulleys shall be adjustable for final system balancing. All fans shall have a dual belt and pulley system. A NEMA-3R disconnect switch shall be factory installed and wired from the fan motor to a junction box installed outside the motor compartment.
- G. All fans shall bear the AMCA Certified Ratings Seal for sound and air performance.
- H. Each fan shall bear a permanently affixed manufacturer's engraved metal nameplate containing the model number and individual serial number for future identification.
- I. Fans shall be Listed by Underwriters Laboratory for UL/cUL 762 Listed for all electrical components and grease removal.
- J. Hinge kit shall be factory mounted to a separate base and constructed of heavy gauge hinges and shall include hold open cables.
- K. Roof curb shall be through bolted to structure and fan lag screwed to curb in a minimum of three places per side.
- L. Grease Trap shall include the drain connection. The unit shall collect grease and water from the fan and extract the grease from the water for ease of grease disposal.
- M. Fans shall be as manufactured by Greenheck, Penn, Cook or approved equal.

2.8 VENT HOOD

- A. Roof mounted vent hood shall be constructed of heavy gauge aluminum or galvanized steel as specified. Hoods shall be constructed of precision formed, arched panels with interlocking seams.
- B. Bases shall be constructed so that the curb cap is 8" larger than the throat size and of a height to restrict entry of moisture and for all applications. Hood support members shall be constructed of galvanized steel and fastened so that the hood can be either removed completely from the base or hinged open.
- C. Birdscreens constructed of 1/2" galvanized steel mesh shall be mounted horizontally across the intake/discharge area of the hood.
- D. Gravity hoods shall be as manufactured by Greenheck or approved equal.

2.9 KITCHEN EXHAUST HOODS (Type I)

- A. Provide cooking equipment hoods of sizes, quantities, and air volumes as indicated on plans and details. Kitchen hood shall be UL 710 listed and rated for 600 °F cooking appliances. Hoods shall be of the double island type and shall have the capability to replace 90% of the exhausted air. Maximum velocity through the hood for supply and exhaust air shall be per manufacturer's

recommendation. Hood interior and exterior shall be constructed with 18 gauge, 400 series stainless steel. The assembly at joints and seams on the hoods shall be liquid tight.

- B. The hoods shall be provided with UL classified aluminum grease filters of sufficient numbers and sizes to insure optimum performance as specified by filter manufacturer. The filter housing shall terminate into an internally pitched full-length grease trough which shall drain into a removable recessed grease drawer.
- C. Vapor proof, UL listed, marine light fixtures shall be installed and pre-wired to a junction box for field connection. Wiring shall conform to NFPA 70.
- D. A control panel shall be housed in a utility cabinet on side of hood. This panel shall include toggle-type switches with indicator lights for the control of hood lights and fans. Both hoods shall operate simultaneously in conjunction with one another. Interlock kitchen hood exhaust and supply fans with an integral hood thermal sensor such as any cooking appliance beneath is activated, the fans shall operate automatically and otherwise, shall not be operating. An additional interlock shall be provided for a high temperature sensor to automatically shut down cooking equipment utilities as excessive temperatures are achieved. The wiring shall conform to the requirements of the National Electrical Code.
- E. Include with hood a pressurized insulated front supply plenum of stainless steel construction to match the hood. Plenum shall have a perforated stainless steel diffuser plate. The plenum, as a minimum shall run the entire length of face of the hood.
- F. Hoods shall be provided with 18" stainless steel enclosure panels. Coordinate panel height with ceiling.
- G. The hoods shall be fabricated in accordance with NFPA 96, shall bear the National Sanitation Foundation Seal of Approval and shall be UL listed. Hoods shall be by Accurex (a Greenheck Company), Duo-Aire, Sun Air, or Captive Aire.
- H. Submittals: Submit fabrication and installation drawings. Identify support points, with load for each point and method of anchorage to structure.
- I. Hood dimensions shall be verified with final layout of equipment served underneath. Hood shall extend beyond sides and front of kitchen cooking equipment in accordance with NFPA 96 and IMC 2015.

2.10 KITCHEN HOOD FIRE EXTINGUISHING SYSTEM

- A. The kitchen hood fire extinguishing system shall be UL and FM approved and shall protect kitchen hoods KH-1 and KH-2 indicated on plans. In addition, the fire extinguishing system shall protect the ducts, plenums, filter areas, and cooking equipment. The system shall be capable of automatic detection and actuation and/or remote manual actuation.
- B. The fire extinguishing system shall be equal to Ansul R-102 Restaurant Fire Suppression System and shall include the regulated release mechanism and chemical agent storage tank(s) within a single enclosure, nozzles, detectors, cartridges, liquid agent, fusible links, pulley tees, pulley elbows, remote manual pull station, electrical automatic shut-off gas valve and power (electrical) "interrupter" with connections, electrical switches, piping, etc.
- C. The electrical automatic shut-off gas valve shall be of the manual reset type such that the valve does not automatically open after closing. The valve shall close with activation of the fire suppression system. Provide a union on both sides of valve for ease of removal for maintenance.
- D. The power "interrupter" shall shut off all power to cooking equipment being protected by the respective fire suppression system. Once the particular suppression system is activated, the power shall be shut off.
- E. System shall be installed in accordance with the latest edition of the applicable standard of NFPA, manufacturer's manual and all applicable state and local codes. A certified factory representative shall perform the final system hook-up.

2.11 DISHWASHER HOOD (TYPE II)

- A. The dishwasher ventilation hood shall be a Type II condensate single wall type hood with no built-

in make-up air capabilities. The hood components shall be fabricated of 18 gage, 300 series stainless steel on all exposed surfaces as required by NSF and NFPA 96. Lighter gages and alternate materials will not be allowed. All seams and joints shall be welded, ground and polished to be liquid tight. The hood shall be provided with hanging angles on centers of 5 feet or less.

- B. Construction of hood shall be accordance with the following testing agency: NSF #1362 and shall bear the NSF Seal of Approval.
- C. The hood shall be fitted with a baffle plate, and full perimeter condensate gutter with drain constructed as an integral part of the canopy.
- D. Hood dimensions indicated on drawings shall be verified with dishwasher manufacturer as to physical dimensions.
- E. Hood for dishwasher shall be by the same manufacturer as kitchen hood manufacturer.
- F. Provide with 18" stainless steel enclosure panels. Coordinate panel height with ceiling.
- G. Submittals: Submit fabrication and installation drawings. Identify support points, with load for each point and method of anchorage to structure.
- H. Acceptable manufacturers shall be Accurex (a Greenheck company), Duo-Aire, Sun Air, or Captive Aire.

2.12 SHEETMETAL DUCTWORK – LOW PRESSURE

A. Ductwork - Low Pressure

1. This part of the specification shall apply to all low pressure rectangular shop fabricated ductwork, for all constant air volume air distribution systems and return air systems. Ductwork shall be constructed of galvanized steel sheets, furnished and installed in sizes as indicated and located where shown on the drawings. This part of the work shall include all ductwork, manual dampers, access panels, louvers, etc., with all accessories to make a complete air distribution system. Noise, vibration or drumming of air in ductwork, noises at air outlets or returns, excessive air leaks, malfunctioning of dampers, etc., will be cause for rejecting affected parts of the ductwork. Duct sizes shown on plans are net and must be increased for total insulation thicknesses as herein specified.
2. The Mechanical Contractor shall coordinate with the General Contractor all ductwork penetrations of walls which require lintels per the architectural plans.
3. The following weights of materials, types of joints and bracing shall be followed for sheetmetal ductwork.

Steel Std. Gauge	U.S. Inches	Maximum Size	Type of Joint Conn.	Transverse Bracing
24		up to 12	S-Drive, pocket or bar clips on 7"-10" centers	None
24		13 to 24	S-Drive, pocket or bar clips on 7"-10" centers	None
24		25 to 30	A-Drive, pocket or bar clips on 7"-10" centers	1x1x1/8" angle
20		30 and greater	S-Drive, pocket or bar clips on 7"-10" centers	1x1x1/8" angle

4. The following details of duct construction shall be adhered to without deviation:
 - a. Longitudinal seams for metal shall be Pittsburgh lock.
 - b. Sweep elbows shall be made with inside radius equal to width of ducts, except as shown on the drawings. Square elbows must be provided with approved turning vanes to assure good air flow to outlets.
 - c. Provide vanes at all elbows. Provide splitter dampers and turning vanes at duct tees.
 - d. Horizontal ducts shall be hung at intervals not exceeding 8'-0" with 18-gauge galvanized

iron hangers extending the full height of the duct.

- e. Shop drawings of all ductwork when for any reason different from drawings shall be submitted to the Architect for approval.
 - f. All ductwork shall be fabricated in strict accordance with SMACNA Construction
5. Standards for Low Velocity Ductwork: All seams shall be caulked or taped to prevent air leakage.

B. Flexible Ductwork Connections:

- 1. All duct connections to air handling units, fans, etc., shall be made through a 4" flexible connection of fire resistant neoprene coated glass fiber cloth as manufactured by Wiremold, Thermoflex, or Fentfab. Connection shall meet pressure classification of system used.
- 2. Flexible ductwork shall be equal to Thermaflex Type M-KE with 1"-1 lb. density insulation (minimum "R" value = 6) with metalized film vapor barrier, and conform to UL 181 as a Class I duct, 45 degree shoe fittings shall be provided at all rectangular or square branch connections to main headers in accordance with SMACNA Standards. Maximum length of flexible ductwork shall be 8'0". Extend rigid duct to within 8'0" of all diffusers to be connected by flexible duct. Provide manual volume damper at each branch duct serving air devices.

- C. Miscellaneous Ductwork Requirements :** At each air handling unit (packaged unit) discharge, ductwork shall be thermally acoustically lined type similar to Acoust-K27 as manufactured by United McGill Corporation. Joints shall be made with slip-joint type couplings similar to flat oval ductwork. Install lined duct through first elbow (10 feet minimum) down stream of air handling units. Provide one (1) pound density, 2" thick insulation wrap on all interior lined ductwork at the air handling unit.

2.13 GRILLES, REGISTERS, AND DIFFUSERS

- A. Location of ceiling mounted air distribution shall be as shown on reflected ceiling plan. Install and fasten air distribution per manufacturer's detailed drawings. Use gaskets to make air tight joints with adjoining construction. Join neatly with adjacent finished surface.
- B. Panel type ceiling diffusers shall be equal to Titus Model TDC-AA for 24" x 24" lay-in frame with an opposed blade damper and directional throws as indicated. Finish shall be off-white color with square to round duct connection. Round duct connection and face size shall be as shown on plans.
- C. Exhaust, return air, soffit and transfer grilles shall be 1/2" x 1/2" x 1/2" aluminum grid type with aluminum frame equal to Titus 50-F. Furnish in an off-white enamel finish. Furnish opposed blade dampers for return, exhaust and transfer registers.
- D. Sidewall registers shall have aluminum double deflection airfoil blades with front blades parallel to long dimension that are individually adjustable for any degree of deflection and an opposed blade damper. Registers shall be equal to Titus 272-FS.
- E. Ceiling diffusers for other than lay-in ceilings shall be equal to Titus TDC-AA with opposed blade damper. Finish shall be off-white color with square to round duct connection. Round duct connection and face size shall be as shown on plans.
- F. Sidewall return air registers shall be all steel bar type with one (1) set of fixed blades set at 3/4" spacing with 35° deflection. Blades shall be parallel to long dimension. Provide opposed blade damper. Registers shall be equal to Titus Model 350-FL.
- G. Acceptable manufacturers are Carnes, J & J, Krueger, Metal-Aire, Nailor-Hart, Reliable, Titus, and Tuttle and Bailey.

2.14 ACCESS DOORS

- A. Air duct access doors shall be steel of the double wall insulated type complete with hinges and camlock latches. Insulation shall be 1" thick fiberglass with "K" factor of .26 at 75°F mean temperature. Provide 12"x12" access doors or removable duct at all fire dampers and where indicated. Doors smaller than 8" shall have plexiglass window. Coordinate with specification

section 08345 (this contractor to furnish).

Duct Diameter	Access Opening
8" thru 10"	7" dia.
11" thru 13"	10" dia.
14" thru 19"	13" dia.
20" and over	10" dia.

B. For flat oval and rectangular ducts, the nominal size of the access opening shall be:

1. When mounted on minor axis:

Minor Axis	Access Opening
8" thru 11"	8" x 12"
12" thru 13"	12" x 12"
14" and over	14" x 20"

2. When mounted on major axis:

Major Axis	Access Opening
8" thru 16"	8" x 12"
17" thru 24"	12" x 12"
25" and over	14" x 20"

C. When used with insulated ducts, the access sections shall have glazed covers to prevent condensation.

2.15 DAMPERS

- A. Dampers of same materials as duct, as least one gauge heavier than duct, reinforced where directed, shall have an accessible location indicating quadrant, locking device for adjusting and locking dampers in position. Stiffen duct at damper location, install damper in manner to prevent rattling.
- B. Manual volume dampers shall be of the opposed blade type. They shall be furnished in sizes shown on plans. Frame and blades shall be 16-gauge galvanized steel with mill galvanized finish. Equal to Ruskin Model MD35.
- C. Automatic (motorized) dampers shall be of the parallel blade type. They shall be furnished in sizes shown on plans. Dampers shall be provided with solid stops for tight closing with seals on the blade edges and the sides of the damper frame which will stand a temperature of up to 220°F. These stops shall be so assembled that they may be easily replaced if they become damaged. Dampers shall be tight closing and shall be capable of less than 1% leakage based on an approach velocity of 1500 feet per minute. Equal to Ruskin No. DC350BES or Ruskin No. CD50 areoblade style.
- D. Stiffen duct at damper location, install damper in manner to prevent rattling.
- E. Fire Dampers: Shall be curtain type with fusible link. Curtain shall be mounted out of air stream. Dampers shall be UL approved & equal to Ruskin.
- F. Manufacturers: Dampers may also be manufactured by Air Balance, Arrow United Industries, Greenheck, Industrial Louvers, Louvers and Dampers, or Nailor-Hart.

2.16 EXHAUST FANS, SUPPLY FANS & GRAVITY VENTILATORS

- A. All exhaust fans shall bear the AMCA Seal of Approval and shall be currently listed in the current AMCA Directory.
- B. Motors shall have a 1 year manufacturer's warranty.

2.17 BATHROOM EXHAUST FANS

- A. Exhaust fans shall be ceiling mounted type fans with 1/2" thick acoustical lined steel housing, direct drive centrifugal fan, back draft damper and integral aluminum ceiling grille. Fans shall have integral disconnect switch and speed controller. Fan control shall be as indicated on schedules. Fans shall be equal to Greenheck SP Series, Loren Cook GC Series, Twin City, or approved equal.

2.18 AIR CURTAIN FANS: (FLY FANS)

- A. Fly fans shall be approved by the National Sanitation Foundation. Fans shall be direct driven type. Exterior housing shall be removable for maintenance and service. Fly fans shall be provided with adjustable louver dampers for velocity control, adjustable vanes for directional control, totally enclosed motor with automatic thermal overload, corrosion resistant polycarbonate cabinet, disconnect switch and micro switch. Provide with 5 year parts warranty. Fans shall be manufactured by Mars, Berner, or approved equal.

2.19 INSULATIONS

- A. General: All insulation work shall be done by workmen thoroughly competent in this trade and employed by a full-time insulation contractor. Failure to finish work neatly, failure to vapor proof joints, ragged edges, failure to cover all fittings, valves, dents on surface, etc., shall be proper cause to reject this work. This Contractor shall call same to the attention of the Architect before such work has progressed beyond the point of economical correction.
- B. All material used shall be new and of first line quality and shall be as recommended by the manufacturer for the service intended. All insulation materials, including sealer material, adhesive, finishes, etc., shall be non-combustible. Complete installation shall be in accordance with manufacturer's requirements.
- C. This Contractor shall be responsible for the removal from the site of all excess materials, cartons, scrap, etc. He shall protect equipment installed by others, cleaning such equipment should mortar, plaster, adhesive, etc., fall on same.
- D. The following service shall be insulated with the listed thickness of materials:

Service	Insulation Material	Thickness	Finish
Drain Piping	Armaflex Type ER	3/8"	Paint with acrylic protective paint where exposed to sun
Single Wall Spiral Round & Flat Oval Ductwork	1 lb. density blanket type fiberglass duct	2"	Reinforced aluminum foil
Single Wall Ductwork	1 lb. density blanket type fiberglass duct	2"	Reinforced aluminum foil

- E. All Armaflex insulation shall be slipped over piping with all joints sealed with an approved mastic.
- F. All insulation shall be installed as per material manufacturer's printed instructions. All valves, fittings, strainers, pete's plugs, etc., shall be insulated with molded fittings of same material as piping and plastic fitting covers installed over all fittings. Insulation shall be Owens-Corning Fiberglass, or approved equal, as scheduled above. All materials, jackets, adhesives, etc., shall meet smoke developed ratings and fire classifications of UL.
- G. Insulation subcontractor shall submit complete product data brochures on insulation materials, jackets, finishes, mastics, cements, etc., for approval along with complete installation brochures for all materials used on this project. Installation methods shall be in accordance with printed instructions from material manufacturers.
- H. It shall be the responsibility of the insulating subcontractor to coordinate hanger locations and prevent crushing or breaking finishes.
- I. All insulation materials, jackets, adhesives, coatings, etc., shall meet the Underwriters' Laboratories fire hazard classification (UL 723), for flame spread rating of 25, smoke developed rating of 50, and fuel contributed rating of 50.
- J. Insulation contractor shall insure all valves with insulation have extended handles. Length of extended handles shall allow operation of handle not to interfere with valve or piping installation.
- K. Interior duct insulation shall be applied inside of all low pressure rectangular ductwork to 10 feet

down stream of air handling unit. Duct dimensions shall be increased both ways by the thickness of the insulation to maintain same duct inside areas shown on the drawings. Insulation shall be constructed of glass fiber and shall be 1.5 pound density 1" thick minimum and shall have a smooth coating next to the air stream which complies with NFPA Bulletins 90A and 90B. Liner shall be cemented using 100% coverage to the metal and shall be secured additionally with "mechanical clips", one per square foot. All joints in insulation shall be butted together and brushed with adhesive. All joints in insulation at duct joints, etc., shall be butted tightly together and sealed with mastic. Insulation shall conform to the duct liner application standard published by SMACNA.

- L. Exterior duct insulation shall be applied outside of all heating and air conditioning ductwork in accordance with SMACNA Standards. Insulation shall be constructed of glass fiber and shall be 2.2 pound density, 1-1/2" thick and comply with NFPA Bulletins 90A and 90B (minimum R value = 6). Insulation shall be wrapped and shall be secured with duct bands. All joints in insulation shall be butted together and brushed with adhesive.

2.20 LOUVERS

A. General

1. Louvers shall be wind-driven, rain resistant (AMCA-550) type and impact rated (AMCA-540) equal to Ruskin EME3625MD. Furnish and install louvers as hereinafter specified where shown on plans. Louvers shall have a drain gutter in each blade and downspouts in jambs and mullions. Stationary double drainable horizontal blades shall be contained within a single 3" deep frame. Manufacturer labels certifying compliance with these standards are required to be permanently attached to the louver at the factory.
2. Louver components (heads, jambs, sills, blades, and mullions) shall be factory assembled by the louver section to provide overall sizes required.
3. Tornado shelter louvers shall be 2014 ICC 500 and FEMA 361 impact compliant, equal to Ruskin XP500. Manufacturer labels certifying compliance with these standards are required to be permanently attached to the louver at the factory.
4. Action Submittals
 - a. Product Data: For each product to be used, including:
 - Manufacturer's product data including performance data.
 - Preparation instructions and recommendations.
 - Storage and handling requirements and recommendations.
 - Installation methods
 - b. Shop Drawings
 - Submit shop drawings indicating materials, construction, dimensions, accessories, and installation details

5. Delivery, Storage and Handling

- a. Store products in manufacturer's unopened packaging until ready for installation.
- b. Store materials in a dry area indoors, protected from damage and in accordance with manufacturer's instructions.
- c. Handling: Protect materials and finishes during handling and installation to prevent damage.
- d. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

6. Project Conditions

- a. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under

environmental conditions outside manufacturer's absolute limits.

7. Warranty

- a. Manufacturer shall provide standard limited warranty for louver systems for a period of five years (60 months) from date of installation, no more than 60 months after shipment from manufacturing plant. When notified in writing from the Owner of a manufacturing defect, manufacturer shall promptly correct deficiencies without cost to the Owner.
- b. Manufacturer shall provide 20 year limited warranty for fluoropolymer-based finish on extruded aluminum substrates.

8. Accessories

- a. Installation angles: Factory provided NOA installation angles to match substrate type.
- b. Bird Screen: Aluminum, 5/8 inches by 0.040 inch (16 mm by 1 mm), expanded and flattened.

9. Finishes

- a. Finish: 50 percent PVDF: Finish shall be applied at 1.2 mil total dry film thickness
 - Coating shall conform to AAMA 2604, sections 4.2 and 4.3. Apply coating following cleaning and pretreatment. Cleaning: AA-C12C42R1X
 - 1) Baked Enamel (50% PVDF)
 - 20-year finish warranty

10. Examination

- a. Inspect areas to receive louvers. Notify the Architect of conditions that would adversely affect the installation or subsequent utilization of the louvers. Do not proceed with installation until unsatisfactory conditions are corrected.
- b. If opening preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

11. Preparation

- a. Clean opening thoroughly prior to installation.
- b. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

12. Cleaning

- a. Clean louver surfaces in accordance with manufacturer's instructions.
- b. Touch-up, repair or replace damaged products before Substantial Completion.

13. Acceptable louver manufacturers shall be: Ruskin, Greenheck, American Warming, Pottorff, Nailor-Hart, Arrow United Industries.

B. Wind Driven Rain Resistant Stationary Blade Wall Louvers

1. Section Includes

- a. AMCA540/550, water, air, and wind driven rain Miami-Dade listed louver.
- b. Extruded aluminum stationary louvers with vertically mounted blades.

2. References

- a. AAMA 2604 – High Performance Organic Coatings on Architectural Extrusions and Panels.
- b. AMCA 500 - Test Methods for Louvers, Dampers and Shutters.
- c. AMCA 540 - Test Methods for Louvers Impacted by Wind Borne Debris with Basic Protection Approval.

- d. AMCA 550 - Test Method for High Velocity Wind Driven Rain Resistant Louvers.
 - e. Miami-Dade County Building Code Compliance Office (BCCO) - Miami-Dade Notice of Acceptance.
3. Definitions
- a. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
 - b. Vertical Louver: Louver with vertical blades; i.e., the axes of the blades are vertical.
 - c. Rain-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.
4. Quality Assurance
- a. Manufacturer Qualifications
 - The manufacturer shall have implemented the management of quality objectives, continual improvement, and monitoring of customer satisfaction to assure that customer needs and expectations are met.
 - Manufacturer shall be International Organization for Standardization (ISO) 9001 accredited.
 - Louvers approved by the Miami-Dade County BCCO for use in open structures that have the ability to drain water that may penetrate. Approval based on tests and procedures performed in accordance with BCCO test protocols TAS-201, TAS-202 and TAS-203.
 - b. Product Qualifications
 - AMCA Listed for compliance to AMCA 540 Level D and AMCA 550 standards.
 - Louvers licensed to bear AMCA Certified Ratings Seal. Ratings based on tests and procedures performed in accordance with AMCA 511 and comply with AMCA Certified Ratings Program. AMCA Certified Ratings Seal applies to air performance and water penetration ratings.
 - Recycled Content: Provide louver that incorporate recycled content materials. The louver shall consist of: extruded aluminum recycled content 73% by weight. 18% post-consumer, 55 % pre-consumer.
5. Wind Driven Rain Stationary Blade Louver
- a. Model: EME3625MD as manufactured by Ruskin Company
 - AMCA 540 Level D and AMCA 550 Listing with the Air Movement and Control Association Certified Ratings Program.
 - b. Fabrication
 - Design: High performance wind-driven rain (WDR) stationary vertical blade louver type with drain spouts in jambs and mullions. Extended sill. Louver design shall limit single span between visible mullions to 60 inches (1524 mm)
 - Frame
 - 1) Frame Depth: 3.125 inches (76.375 mm)
 - 2) Material: Extruded aluminum, Alloy 6063-T6
 - 3) Wall Thickness: 0.080 inch (2.0 mm), nominal
 - Blades
 - 1) Style: Vertical
 - 2) Material: Extruded aluminum, Alloy 6063-T6

- 3) Exterior Wall Thickness: 0.050 inch (1.3 mm), nominal
- 4) Centers: 3/4 inch (19 mm), nominal
- Fabrication
 - 1) Mullion Style – Design incorporates visible mullions or frames at the perimeter of the louver and also at certain intervals within the louver perimeter to support the louver blades. Louver blade sightlines are interrupted at the mullion locations.
 - 2) Mechanically fastened
- Minimum Assembly Size: 12 inches wide by 12 inches high (305 mm x 305 mm).
- Maximum Factory Assembly Size: Single sections shall not exceed 60 inches wide by 96 inches high (1524 mm x 2438 mm). Unlimited width x 96" tall. Louvers larger than the maximum single size shall be require field assembly of smaller sections.
- Recycled Content: 18% post-consumer. 55% pre-consumer, post-industrial, total 73% by weight
- c. Performance Data
 - Performance Ratings: AMCA licensed
 - 1) Based on testing 48 inch by 48 inch (1219 mm by 1219 mm) size unit in accordance with AMCA 500.
 - Free Area: 53 percent, nominal
 - Free Area Size: 8.49 sf
 - Maximum Recommended Air Flow through Free Area: 1250 feet per minute (6.35m/s)
 - Air Flow: 10612 cubic feet per minute (300 cu. m/min)
 - Maximum Pressure Drop: .16 inches w.g. (.04 kPa)
- d. Wind Driven Water Penetration Performance
 - Based on testing 39 inches x 39 inches (1 m x 1 m) core area, 41 inches x 44 inches (1.04 m x 1.12 m) nominal size unit in accordance with AMCA 500-L.
 - Wind Velocity: 29 mph (47 kph)
 - 1) Rainfall Rate: 3 inches/hour (76 mm/hour).
 - 2) Free Area Velocity: 1674 feet per minute (8.5 m/sec).
 - 3) Water Resistance Effectiveness: 100% (AMCA Class A). Up to 5 m/s.
 - Wind Velocity: 50 mph (80 kph)
 - 1) Rainfall Rate: 8 inches/hour (203 mm/hour).
 - 2) Free Area Velocity: 1675 feet per minute (8.5 m/sec).
 - 3) Water Resistance Effectiveness: 99.5% (AMCA Class A). Up to 5 m/s.
- e. Miami-Dade County Protocols Compliance
 - TAS-201 Large and Small Missile Impact Test
 - TAS-202 Uniform Static Air Pressure Test

6. Installation

- a. Install louvers at locations indicated on the drawings and in accordance with manufacturer's instructions.
- b. Install louvers plumb, level, in plane of wall, and in alignment with adjacent work.

- c. The supporting structure shall be designed to accommodate the point loads transferred by the louvers when subject to the design wind loads.
 - Louvers shall be secured to a structural substrate in accordance with Dade County Product Approval Drawings

C. FEMA 361 Approved Stationary Blade Wall Louvers

1. Section Includes

- a. FEMA 361 Approved Stationary Blade Louver

2. References

- a. Federal Emergency Management Agency (FEMA) 361 - Design and Construction Guidance for Community Safe Rooms.
- b. ICC 500: 2008 Standard for the Design and Construction of Storm Shelters.
- c. AAMA 2604 – High Performance Organic Coatings on Architectural Extrusions and Panels.
- d. AAMA 611 – Voluntary Specification for Anodized Architectural Aluminum.
- e. AMCA 500 - Test Methods for Louvers, Dampers and Shutters.
- f. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- g. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- h. ASTM D822 - Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- i. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
- j. ASTM D2244 - Standard Test Method for Calculation of Color Differences From Instrumentally Measured Color Coordinates.

3. Definitions

- a. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- b. Horizontal Louver: Louver with horizontal blades.

4. Quality Assurance

a. Manufacturer Qualifications

- The manufacturer shall have implemented the management of quality objectives, continual improvement, and monitoring of customer satisfaction to assure that customer needs and expectations are met.
- Manufacturer shall be International Organization for Standardization (ISO) 9001 accredited.

b. Product Qualifications

- Louvers licensed to bear AMCA Certified Ratings Seal. Ratings based on tests and procedures performed in accordance with AMCA 511 and comply with AMCA Certified Ratings Program. AMCA Certified Ratings Seal applies to air performance and water penetration ratings.
- Recycled Content: Provide louver that incorporate recycled content materials. The louver shall consist of the following recycled content
 - 1) Fabricated aluminum recycled content 73% by weight. 18% post-consumer, 55 % pre-consumer

5. FEMA Approved Stationary Blade Louver

- a. Model: XP500 as manufactured by Ruskin Company
- b. Fabrication: Formed Aluminum stationary horizontal chevron louver style
 - Frame
 - 1) Frame Depth: 5 inches (127 mm)
 - 2) Wall Thickness: 0.25 inch (6 mm), nominal
 - 3) Material: formed aluminum
 - Blades
 - 1) Style: Horizontal mounted chevron sight proof
 - 2) Wall Thickness: 0.25 inch (6 mm), nominal
 - 3) Material: formed aluminum
 - Minimum assembly size: 12 inches wide by 12 inches high (305 mm x 305 mm)
 - Maximum assembly size: Unlimited width by 90 inches high (2286 mm)
 - Maximum shipping width by 90 inches high (2286 mm)
 - 1) 300 PSF: 78 inches high (1981 mm)
 - 2) 250 PSF: 90 inches high (2286 mm)
 - 3) 200 PSF: 96 inches high (2438 mm)
 - Recycled Content: 18% post-consumer. 55% pre-consumer, post-industrial
- c. Performance Data
 - Free Area: 46 percent, nominal
 - Maximum Recommended Air Flow through Free Area: 900 feet per minute (4.57 m/sec)
 - Air Flow: 7600 cubic feet per minute (3,587 l/s)
 - Maximum Pressure Drop (Intake): 0.30 inches w.g. (0.07 kPa)
- d. Designed Windload
 - 300 PSF: On units up to 78 inches high (1981 mm)
 - 250 PSF: On units up to 90 inches high (2286 mm)
 - 200 PSF: On units up to 96 inches high (2438 mm)
- e. Labels
 - Louvers to have permanent (riveted to louver) embossed aluminum tag to louver with certification label of the certified testing agency acceptable to the authorities having jurisdiction. Label to include:
 - 1) Design Pressure
 - 2) Tested Pressure
 - 3) Missile Criteria
 - 4) ICC-500 (2014) Certification Listing

6. Installation

- a. Install louvers at locations indicated on the drawings and in accordance with manufacturer's instructions.

- b. Install louvers plumb, level, in plane of wall, and in alignment with adjacent work.
- c. Secure louver to structure to comply with FEMA 361 and the following:
 - Substrate: CMU, Grout filled.1500 Min. PSI
 - 1) Anchor Type: 3/4 inch (19 mm) diameter Hilti HIT HY 150 x 8 in (203) long threaded adhesive anchor.
 - 2) Embedment: 6-3/4 inches (172 mm) minimum
 - 3) Factory Attachment Angle secured at factory
 - 4) Shipped Loose Attachment Angle: 4 in x 6 in x 20 in long (102 x 152 x 508) A36 HDG angle. 1/2 in (13) thick
 - Substrate: Concrete 2500 PSI Minimum Compression Strength
 - 1) Anchor Type: Hilti Kwik Bolt TZ CS III 1/2 (6) diameter x 3-3/4 in (95) long
 - 2) Embedment: 3-1/2 inches (89 mm) minimum
 - 3) Factory Attachment Angle secured at factory
 - Substrate: Steel Framing
 - 1) Factory Attachment Angle secured at factory

2.21 AIR TERMINAL UNITS

A. General

a. DESV BASIC UNIT

- Furnish and install titus model desv single duct, variable air volume terminals of the sizes and capacities shown in the plans.
- Terminals shall be certified under the ARI standard 880 certification program and carry the ARI seal.
- The terminal casing shall be minimum 22-gauge galvanized steel, internally lined with 1-inch foil lined dual density insulation which complies with UL 181 and NFPA 90a.
- The damper shall be heavy gauge steel with shaft rotating in Delrin® self-lubricating bearings.

B. Performance

- a. At an inlet velocity of 2000 fpm, the minimum static pressure required to operate any terminal size shall not exceed 0.13-inch wg for the basic terminal.
- b. Sound performance shall be ARI certified.

C. Hot water reheat coils:

- a. Hot water reheat coils shall be enclosed in a minimum 20-gauge galvanized steel casing with slip and drive construction for attachment to metal ductwork. Coils shall be factory installed on the terminal discharge. Coil performance data shall be based on tests run in accordance with ari standard 410.

2.21 CONTROLS

- A. Coordinate controls of system with controls specification section 15950 "Energy Management Control".

2.22 AIR PURIFICATION DEVICE (Bi-polar Ionization)

A. Quality Assurance:

- 1. The air purification system shall be a product of an established manufacturer in the USA. A qualified representative from the manufacturer shall be available to inspect the installation of the air purification system(s) to ensure installation in accordance with the manufacturer's

recommendation. Technologies that do not address gas disassociation such as UV lights, powered particulate filters, and/or polarized media filters shall not be allowed. Uni-polar ion generators or plasma particulate filters shall not be allowed.

2. This project is designed in accordance with ASHRAE Standard 62 IAQ Procedure and shall require the manufacturer to provide Indoor Air Quality calculations using the formulas within ASHRAE 62.1-2007 to validate acceptable indoor air quality at the quantity of outside air scheduled with the technology submitted.
3. The air purification system shall be tested by UL or ETL to prove conformance to UL 867-2007 including the ozone chamber testing and peak ozone test for electronic devices. Manufacturers that achieve UL 867 prior to December 21, 2007 and have not been tested in accordance with the newest UL 867 standard with the ozone amendment shall not be acceptable. All manufacturers shall submit independent UL 867 test data with ozone results to the engineer during the submittal process. All manufacturers shall submit a copy with their quotation. Contractors shall not accept any proposal without the proper ozone testing documentation.
4. The maximum allowable ozone concentration per the UL 867-2007 chamber test shall be 0.007 PPM. The maximum peak ozone concentration per the UL 867-2007 peak test as measured 2 inches away from the electronic air cleaner's output shall be no more than 0.0042 PPM. Manufacturers with ozone output exceeding these ozone values shall not be acceptable.

B. Submittals:

1. Submit manufacturer's technical product data for ion generators including:
2. Schedule of plasma generators indicating unit designation, number of each type required for each unit/application.
3. Data sheet for each type of plasma generator, and accessory furnished; indicating construction, sizes, and mounting details.
4. Performance data for each type of plasma device furnished.
5. Indoor Air Quality calculations using the formulas within ASHRAE 62.1-2007 to validate acceptable indoor air quality at the quantity of outside air scheduled.
6. Product drawings detailing all physical, electrical, and control requirements.
7. Copy of UL 867 independent ozone test.

C. Delivery, Storage, & Handling:

1. Deliver in factory shipping containers. Identify on outside of container type of product and location to be installed. Avoid crushing or bending. Store in original cartons and protect from weather and construction work traffic. Store indoors and in accordance with the manufacturer's recommendation for storage.

D. Warranty:

1. Equipment shall be warranted by the manufacturer against defects in material and workmanship for a period of 2 years after shipment. Labor to replace equipment under warranty shall be provided by the installing contractor.

E. General:

1. The air purification system(s) shall be of the size, type, arrangement, and capacity indicated and required by the unit furnished and shall be of the manufacturer (or listed equal) specified.
2. All other suppliers of comparable products requesting prior approval shall submit for prior approval in accordance with the requirements of Section 15100. In addition, supplier shall provide their ASHRAE 62.1-2007 calculations that prove conformance to the ASHRAE Standard with the reduction of outside air to the scheduled values. A letter on the manufacturer's letterhead requesting prior approval must accompany the request for prior

approval stating their calculations are ASHRAE compliant. A third party validation study performed on a previous installation of the same application shall also be included. Provide independent test data from ETL or UL showing ozone levels produced during the UL 867 ozone chamber test. Manufacturers without this test data shall not be acceptable.

F. Design & Performance Criteria:

1. Each piece of air handling equipment, so designated on the plans, details, equipment schedules, and/or specifications shall contain a plasma generator with bi-polar ionization output as described herein.
2. The bi-polar ionization system shall be capable of:
 - a. Effectively killing microorganisms downstream of the bi-polar ionization equipment (mold, bacteria, virus, etc.).
 - b. Controlling gas phase contaminants generated from human occupants, building structure and furnishings.
 - c. Capable of reducing static space charges.
 - d. Increasing the interior ion levels, both positive and negative, to a minimum of 800 ions/cm³ measured 5 feet from the floor.
3. The bi-polar ionization system shall operate in a manner such that equal amounts of positive and negative ions are produced. Uni-polar ion devices shall not be acceptable.
4. Air exchange rates may vary through the full operating range of a constant volume or VAV system. The quantity of air exchange shall not be increased due to the requirements of the air purification system.
5. The air purification device shall not have maximum velocity profile.
6. Plasma generators shall not require preheat protection when the relative humidity of the entering air exceeds 85%. Relative humidity from 0-100% condensing shall not cause damage, deterioration, or dangerous conditions within the air purification system. Air purification system shall be capable of wash down duty.

G. Equipment Requirements:

1. Electrode specifications:
 - a. Each Plasma generator with bi-polar ionization output shall include the required number of electrodes and power generators sized to the air handling equipment capacity. Unit shall be capable of treating total airflow scheduled on plans. Bi-polar ionization tubes manufactured of glass and steel mesh shall not be allowed due to replacement requirement, maintenance, performance reduction over time, ozone production and corrosion.
 - b. Electrodes shall be energized when the main unit disconnect is turned on and the fan is operating. Electrodes shall be made from carbon fiber to prevent oxidation over time.
 - c. Electrode pair shall provide a minimum of 140 million ions per cubic centimeter, both positive and negative ions in equal quantities. Devices providing less than the rated ion densities shall not be acceptable.
2. Air Handler Mounted Units: Where so indicated on the plans and/or schedules, plasma generators shall be provided and installed. The mechanical contractor shall mount the plasma generator and wire it to the AHU control power (24 VAC) as instructed by the air purification manufacturer's instructions or line voltage subject to power available. Each unit shall be designed with in integral illuminated LED and dry contacts to prove ion output is operating properly. The dry contacts shall close to prove the ion generator is working properly and may be daisy chained in series such that only one dry contact per AHU is required to interface to the BAS or the optional DDC controller. Dry contacts proving power has been applied in lieu of the ion output is actually operating are not acceptable.
3. Plenum/Duct Mounted Units: Where so indicated on the plans and/or schedules, plasma

generators shall be provided and installed. The generator shall be installed through the duct wall and into the airstream with the external power head in a convenient location for visual indication of power, removal and servicing, by the mechanical contractor. The dry contacts shall close to prove the ion generator is working properly and may be daisy chained in series such that only one dry contact per duct is required to interface to the BAS or the optional DDC controller.

4. Ionization Requirements: Plasma generators with bi-polar ionization output shall be capable of controlling gas phase contaminants and shall be provided for all equipment listed above.
 - a. The bi-polar ionization system shall consist of bi-polar plasma generator and power supply. The bi-polar system shall be installed where indicated on the plans or specified to be installed and powered by 24 VAC.
 - b. The ionization output shall be controlled such that an equal number of positive and negative ions are produced. Imbalanced levels shall not be acceptable.
 - c. Ionization output from each electrode shall be a minimum of 140 million ions/cc when tested at 1" from the ionization generator.
5. All manufacturers shall provide documentation by an independent NELEC accredited laboratory that proves the product has minimum kill rates for the following pathogens given the allotted time and in a space condition:
 - a. MRSA - >96% in 30 minutes or less
 - b. E.Coli - >99% in 15 minutes or less
 - c. TB - >69% in 60 minutes or less
 - d. C.diff - >86% in 30 minutes or less
6. Manufacturers not providing the equivalent space kill rates shall not be acceptable. All manufacturers requesting prior approval shall provide to the engineer independent test data from a NELEC accredited independent lab confirming kill rates and time meeting the minimum requirements stated above. Products tested only on Petri dishes to prove kill rates shall not be acceptable.
7. The operation of the electrodes or bi-polar ionization units shall conform to UL 867-2007 with respect to ozone generation. There shall be no ozone generation during any operating condition, with or without airflow.

H. Electrical Requirements:

1. Wiring, conduit, and junction boxes shall be installed within housing plenums in accordance with NEC NFPA 70. The contractor shall coordinate electrical requirements with the air purification manufacturer during submittals.
2. Control Requirements:
3. All plasma generators shall have internal short circuit protection, overload protection, and automatic fault reset.
4. Integral airflow sensing shall modulate the plasma output as the airflow varies or stops. A mechanical airflow switch shall not be acceptable as a means to activate the plasma device due to high failure rates and possible pressure reversal.
5. The installing contractor shall mount and wire the plasma device within the air handling unit specified or as shown on plans. The contractor shall follow all manufacturer IOM instructions during installation.
6. All plasma devices shall have a means to interface with the BAS system. Dry contacts shall be provided to prove there are ions being produced. Systems providing indication that power is applied to the plasma device, but not directly sensing the power at the ion output shall not be acceptable.
7. Plasma systems that use multiple modules with ion output alarm wires wired to the same

terminal such that all ion modules must fail to show an alarm status shall not be acceptable.

I. Execution:

1. The Contractor shall be responsible for maintaining all air systems until the Owner accepts the building.
2. All equipment shall be assembled and installed in a workman like manner to the satisfaction of the Owner, Architect, and Engineer.
3. Any material damaged by handling, water, or moisture shall be replaced by the mechanical contractor at no cost to the Owner.
4. All equipment shall be protected from dust and damage on a daily basis throughout construction.
5. Provide the manufacturer's recommended electrical tests.
6. A manufacturer's authorized representative shall provide start-up supervision and training of Owner's personnel in the proper operation and maintenance of all equipment.
7. Acceptable manufacturers shall be Top Product Innovations, Global Plasma Solutions, or approved equal.

2.23 PARTICULATE AIR FILTRATION BY NATURAL CONVERSION PROCESS

- A. General: as an alternative to bi-polar ionization air purification device, air purification may be provided by natural conversion processes.

1. Summary

- a. This section describes the design, performance and installation of an air purification system intended for use as part of another manufacturer's air handling unit mounted within the duct as shown on the plans, details, and equipment schedules. Installation of the air purification system shall be per manufacturer's requirements.
 - This Section specifies NCC units designed to kill mold, virus, bacteria, and odors. Units are intended for assembly within ductwork of building ventilation systems.

2. Definitions

- a. NCC - Natural Catalytic Conversion - The process of introducing ultraviolet light in conjunction with a coated matrix to provide a continuous disinfection technology. The process is based on photocatalysis, which creates safe levels of hydrogen peroxide to attack viruses, bacteria, and mold at the molecular level.
- b. NELAP - National Environmental Laboratory Accreditation Program.

3. Submittals

- a. Product Data: For each type of product. Include dimensions; operating characteristics; required clearances and access; efficiency and test method; fire classification; furnished specialties; and accessories for each model indicated.
- b. Shop Drawings: For each NCC Device.
 - Include plans, elevations, sections, details, and attachments to other work.
 - Show unit dimensions, materials, and methods of assembly of components.
 - Include setting drawings, templates, and requirements for installing anchor materials.
 - Include diagrams for power, signal, and control wiring.
- c. Product Test Reports: For each NCC Device, for tests performed by a qualified third-party testing agency and customer.
- d. Field quality-control reports.

4. Closeout Submittals

- a. Operation and Maintenance Data: For each type of NCC Device to include, operation, and maintenance manuals.
5. Maintenance Material Submittals
 - a. Any extra materials furnished that match products/sub-components installed shall be packaged with protective covering for storage and identified with labels describing contents.
6. Quality Assurance
 - a. The NCC Air Purification System shall be manufactured in an established, ISO13485 certified manufacturer within the USA and shall meet the requirements of the "Buy America" program as outlined in 49CFR661.5.
 - b. A qualified representative from the manufacturer shall be available to inspect the installation of the NCC Units to ensure installation in accordance with manufacturer's recommendation.
 - c. Technologies that do not address gas disassociation such as UV Lights, Powered Particulate Filters and/or polarized media filters are not acceptable.
 - d. Projects designed using ASHRAE Standard 62.1, Indoor Air Quality (IAQ) Procedure shall require the manufacturer to provide Indoor Air Quality calculations using the formulas within ASHRAE Standard 62.1, to validate acceptable indoor air quality at the quantity of outside air scheduled with the technology submitted. The manufacturer shall provide independent test data on previous installations of similar applications, performed within the past two years, that proves compliance with ASHRAE 62.1 and the accuracy of the calculations.
 - e. The maximum allowable ozone concentration per UL867 section 40 chamber test shall be 0.05 PPM. At minimum, the units shall be CARB certified so as to ensure compliance with this specification.
- B. Products
 1. General
 - a. Provide premanufactured Air Purification System of the size, type, arrangement and capacity as needed for the application. Provide units as required to provide the required capability of killing mold, bacteria, and viruses in the air and on surfaces. Provide System units incorporated into/adjacent to the HVAC units furnished for the project.
 - b. Basis-of-Design Product: Subject to compliance with requirements, provide Natural Catalytic Conversion (NCC) Units for duct mounted applications.
 - Any manufacturer meeting or exceeding the specified requirements will be considered.
 - c. Each piece of air handling equipment, so designated, details the equipment schedules and/or specifications as required to contain a NCC unit output and power supply as described in this Specifications herein: Natural Catalytic Conversion Hydrogen Peroxide (H_2O_2) is a water molecule with an extra atom of oxygen with well-known antimicrobial properties. These low-level oxidizers are capable of killing mold, bacteria, viruses in the air and on surfaces.
 - d. Provide NCC unit system capable of the following:
 - Provide (NCC) "no-touch" disinfection technology that produces oxidizers, predominantly Hydrogen Peroxide out of ambient air.
 - Provide system that effectively kills microorganisms downstream of the NCC equipment in the air and on surfaces (mold, bacteria, virus, etc.).
 - Provide documentation by an independent NELAC accredited laboratory that proves the product has minimum kill rates on surfaces for the following pathogens given the allotted time and in a space condition:

- 1) MRSA > 99.98% in 6 hours
 - 2) Fungi > 95% in 6 hours
 - 3) Influenza (H1N1) > 99.93% in 6 hours
 - 4) MS2 > 99.993% in 6 hours
- Provide documentation by an independent NELAC accredited laboratory that proves the product has minimum kill rates in the air for the following pathogens given the allotted time and in a space condition.
 - 1) MS2 > 99.9% in 1 hour
 - Provide system that operates to produce safe levels of Hydrogen Peroxide between .01-.04 ppm. At .04 ppm (at the high end), the concentration is more than 25 times lower than the OSHA safety limit of 1 ppm for an eight-hour shift.
 - Production of ozone over 50 ppb as a byproduct or primary product of the catalytic reaction is not acceptable. Ozone can sometimes be called Activated Oxygen or Tri-Oxygen, for marketing purposes.
- Ozone (O3) – an oxygen molecule with an extra atom of oxygen used to be a popular substance produced by air cleaners (ozone generators); however, it is now widely accepted that ozone is toxic and can cause harm to humans in high concentrations.
- System is designed for mounting on the side of ductwork or within HVAC equipment after the supply plenum at least 24 inches from the heating element, as scheduled on the drawings or as indicated in the Manufacturer's manual.
 - System is capable of accepting 120-277 VAC.
 - System does not require airflow to operate properly but only operates when airflow is present.
 - Provide units capable of operation at -14° to 160°F temperature range, and 20-99% non-condensing humidity range.
 - Provide system units that do not require periodic maintenance beyond the normal replacement of the plasma bulb every 18 months and the entire NCC Cell every 36 months.

C. Execution

1. Examination

- a. Examine NCC units and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- b. Proceed with installation only after unsatisfactory conditions have been corrected.

2. Installation

- a. Position each NCC unit within existing duct work or within the ceiling, utilizing manufacture's clearance for normal service and maintenance. Anchor electronic NCC units to substrate per manufacturer's written recommended installation procedures.

3. Control Connections

- a. Install control and electrical power wiring to field-mounted control devices.
- b. Connect control wiring between controlled devices.

4. Field Quality Control

- a. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

- b. Perform any desired tests and inspections with the assistance of a factory-authorized service representative.
- 5. Cleaning
 - a. After completing system installation and testing, adjusting, and balancing air-handling and air-distribution systems, ascertain that NCC units are clean and working per manufacturer's guidelines and instructions.
- 6. Protection
 - a. Protect installed products and accessories from damage during construction.

PART 3 - EXECUTION

3.1 PROTECTION OF EQUIPMENT

- A. Deliver equipment to site in sealed containers or weatherproof wrap. Mechanical equipment spaces shall be ready to receive units prior to shipment. Air handling units shall not be stored outdoors. Follow manufacturer's printed instructions for unloading and moving equipment. Handle and place equipment with care to avoid damage to casing or structural components. Protect equipment during construction with coverings, and build temporary catwalks over units when workmen require overhead access in unit location.

3.2 ELECTRICAL WIRING

- A. Install electrical devices furnished by manufacturer but not specified to be factory mounted. Furnish copy of manufacturer's wiring diagram submittal to electrical installer. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-16 sections. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.

3.3 PIPING CONNECTIONS

- A. Provide piping, valves, accessories, gauges, supports, and flexible connectors as indicated. Flexible pipe connectors shall not be used to correct for misalignment of piping to unit connections. Offset in flexible pipe connectors shall not exceed 1/4". Provide trapped, insulated, copper condensate drain piping from each drain connections as shown and extend independently to disposal point as part of this section's work.

3.4 TESTING OF PIPING SYSTEMS

- A. General: Contractor shall notify Architect of tests twenty-four hours in advance. All tests shall be witnessed by the Architect or his representative. Contractor shall provide a minimum 6" dial pressure gauge to indicate all test pressures and the scale shall be not more than 0 to 160 psi and 1 psi graduations. Test shall be held for a minimum of five (5) hours with no apparent loss of pressure.
- B. The following systems shall be tested at pressures indicated:
 - 1. Drain piping - 10 psi
- C. All tests shall be verified by a test record maintained on the site and witnessed by the signature of inspector.
- D. Any portion of system failing to pass test shall be retested until proven acceptable.

3.5 AIR SYSTEM TESTING

- A. Upon completion of installation of the equipment, start-up and operate equipment to demonstrate capability and compliance with requirements. Field correct malfunctioning units, then retest to demonstrate compliance. Equipment shall not be operated during construction or for contractor comfort.

3.6 CLOSEOUT MANUALS

- A. Operating and maintenance information shall be provided to the building owner. This information

shall include, but not be limited to, the information specified.

- B. Construction documents shall require that an operating manual and a maintenance manual be provided to the building owner or the designated representative of the building owner within 90 days after the date of system acceptance. These manuals shall be in accordance with industry-accepted standards (see Informative Appendix E) and shall include, at a minimum, the following:
 - 1. Submittal data stating equipment size and selected options for each piece of equipment requiring maintenance.
 - 2. Operation manuals and maintenance manuals for each piece of equipment and system requiring maintenance, except equipment not furnished as part of the project. Required routine maintenance actions shall be clearly identified.
 - 3. Names and addresses of at least one service agency.
 - 4. HVAC controls system maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings at control devices or, for digital control systems, in programming comments.
 - 5. A complete narrative of how each system is intended to operate, including suggested setpoints.
- C. Construction documents shall require for all lighting equipment and lighting controls, an operating and maintenance manual be provided to the building owner or the designated representative of the building owner within 90 days after the date of system acceptance. These manuals shall include, at a minimum, the following:
- D. Submittal data indicating all selected options for each piece of lighting equipment, including but not limited to lamps, ballasts, drivers, and lighting controls.
- E. Operation and maintenance manuals for each piece of lighting equipment and lighting controls with routine maintenance clearly identified including, as a minimum, a recommended relamping/cleaning program and a schedule for inspecting and recalibrating all lighting controls.
- F. A complete narrative of how each lighting control system is intended to operate including recommended settings.

3.7 GUARANTEE

- A. The Contractor shall guarantee, in writing, the entire system when completed to be free from any and all defects and shall guarantee the entire system, controls and other equipment against defective materials and workmanship for a period of one (1) year from date of completion and acceptance.
- B. Upon receipt of notice from the Owner of the failure or any part of the guaranteed equipment during the guarantee period, the affected part or parts shall be promptly repaired or replaced with new parts by and at the expense of the Contractor.
- C. Under the guarantee clause, the Contractor shall include free routine maintenance for a period of one (1) year from the date of final acceptance.

END OF SECTION

SECTION 15950 – ENERGY MANAGEMENT CONTROL SYSTEM AND DIRECT DIGITAL CONTROLS

PART 1 – GENERAL

1.1 WORK INCLUDED

- A. General - Building Management System (BMS) Contractor shall provide and install:
- B. Complete temperature control system to be DDC with electric actuation as specified herein.
- C. All wiring, conduit, panels, and accessories for a complete operational system.
- D. BMS Contractor shall be responsible for all electrical work associated with the BMS.
- E. Perform all wiring in accordance with all local and national codes.
- F. Install all line voltage wiring, concealed or exposed, in conduit in accordance with the Division 16 specifications, NEC and local building code.
- G. Provide extension of 120 volt, 20 amp circuits and circuit breakers from Emergency power panels for all BMS equipment power. Provide and install local UPS Power supply for all BMS system panels and equipment.
- H. Surge transient protection shall be incorporated in design of system to protect electrical components in all DDC Controllers and operator's workstations.
- I. All low voltage electrical control wiring throughout the building whether in exposed areas shall be run in conduit in accordance with the Division 16 specifications, local building code and the NEC.
- J. Provide system graphics for each controlled device and/or integrated systems as required by the owner. Origin of information shall be transparent to the operator and shall be controlled, displayed, trended, etc. as if the points were hardwired to the BMS.

1.2 GENERAL PRODUCT DESCRIPTION

- A. The installation of the control system shall be performed under the direct supervision of the controls manufacturer with the shop drawings, flow diagrams, bill of materials, component designation, or identification number and sequence of operation all bearing the name of the manufacturer. The installing manufacturer shall certify in writing, that the shop drawings have been prepared by the equipment manufacturer and that the equipment manufacturer has supervised their installation. In addition, the equipment manufacturer shall certify, in writing, that the shop drawings were prepared by their company and that all temperature control equipment was installed under their direct supervision.
- B. All materials and equipment used shall be standard components, regularly manufactured for this and/or other systems and not custom designed specially for this project. All systems and components shall have been thoroughly tested and proven in actual use for at least two years.
- C. The system shall be scalable in nature and shall permit expansion of both capacity and functionality through the addition of sensors, actuators, DDC Controllers, and operator devices.
- D. System architectural design shall eliminate dependence upon any single device for alarm reporting and control execution. Each DDC Controller shall operate independently by performing its own specified control, alarm management, operator I/O, and data collection. The failure of any single component or network connection shall not interrupt the execution of any control strategy, reporting, alarming and trending function, or any function at any operator interface device.
- E. DDC Controllers shall be able to access any data from, or send control commands and alarm reports directly to, any other DDC Controller or combination of controllers on the network without dependence upon a central or intermediate processing device. DDC Controllers shall also be able to send alarm to multiple operator workstations without dependence upon a central or intermediate processing device.
- F. DDC Controllers shall be able to assign password access and control priorities to each point individually. The log-on password (at any PC workstation or portable operator terminal) shall

enable the operator to monitor, adjust or control only the points that the operator is authorized for. All other points shall not be displayed at the PC workstation or portable terminal. (e.g., all base building and all tenant points shall be accessible to any base building operators, but only certain base building and tenant points shall be accessible to tenant building operators). Passwords and priority levels for every point shall be fully programmable and adjustable.

1.3 RELATED SECTIONS

- A. The General Conditions of the Contract, Supplementary Conditions, and General Requirements are part of this specification and shall be used in conjunction with this section as part of the contract documents.
- B. The following sections constitute related work:
 - 1. Section 15100 – General Requirements
 - 2. Section 15995 – Commissioning of HVAC Systems
 - 3. Section 16100 – Electrical
 - 4. Section 16720 – Fire Detection and Alarm Systems
 - 5. Section 15400 – Plumbing
 - 6. Section 15800 – HVAC
 - 7. Section 15200 – Testing, Adjusting, and Balancing for HVAC

1.4 APPROVED CONTROL SYSTEM PRODUCTS AND CONTRACTOR

- A. The following is the only acceptable Control System Product:
Siemens TALON Automation System
- B. The following is the approved Control System Contractor:
Engineered Cooling Services – Product Line: Siemens TALON Automation System
Control Vendor Contact: Alessa Smith (850) 512-2321
 Bobby Marcus, P.E. (850) 393-3300

Approved Equal; Must obtain approval prior to submitting bid
- C. The new BAS system installed shall communicate to the Existing Baldwin County Board of Education Tridium N4 Supervisor Graphical Workstation
 - 1. The new BAS system shall integrate to existing Tridium N4 Supervisor
 - 2. All graphics for new BAS system shall be developed for the Tridium N4 Supervisor. Graphics should include individual graphics for each piece of equipment, floorplans, and any integrated equipment.

1.5 QUALITY ASSURANCE

- A. The BAS system shall be designed and installed, commissioned and serviced by factory trained personnel. BAS contractor shall be Engineered Cooling Services. BMS contractor shall have an in-place support facility within 100 miles of the site with technical staff, spare parts inventory and necessary test and diagnostic equipment. The BMS contractor shall provide full time, on site, experienced project manager for this work, responsible for direct supervision of the design, installation, start up and commissioning of the BMS. The Bidder shall be regularly engaged in the installation and maintenance of BMS systems and shall have a minimum of ten (10) years of demonstrated technical expertise and experience in the installation and maintenance of BMS systems similar in size and complexity to this project.
- B. The BMS contractor shall have a minimum of Three (3) Tridium N4 Certified technicians and Three (3) Siemens Certified technicians.

- C. The BMS contractor shall maintain a service organization consisting of factory trained service personnel and provide a list of ten (10) projects, similar in size and scope to this project, completed within the last five years.
- D. Materials and equipment shall be the catalogued products of manufacturers regularly engaged in production and installation of automatic temperature control systems and shall be manufacturer's latest standard design that complies with the specification requirements.
- E. All BAS peer-to-peer network controllers, central system controllers, and local user displays shall be UL Listed under Standard UL 916, category PAZX; Standard ULC C100, category UUKL7; and under Standard UL 864, categories UUKL, UDTZ, and QVAX and be so listed at the time of bid. All field level controllers shall comply with UL Standard UL 864 category UUKL; Standard UL 864, categories UDTZ, and QVAX and be so listed at the time of Bid.
- F. The BAS peer-to-peer network controllers and local user display shall also comply with the European Electromagnetic Compatibility (EMC) Framework, and bear the C-Tic Mark to show compliance. The purpose of the regulation is to minimize electromagnetic interference between electronic products, which may diminish the performance of electrical products or disrupt essential communications.
- G. DDC peer-to-peer controllers shall be compliant with the European EMC Directive, Standards EN 50081-2 and EN 50082-2, at the Industrial Levels. Additionally the equipment shall be compliant with the European LVD Directive and bear the CE mark in order to show compliance to both directives.
- H. All electronic equipment shall conform to the requirements of FCC Regulation, Part 15, Governing Radio Frequency Electromagnetic Interference and be so labeled.
- I. The manufacturer of the building automation system shall provide documentation supporting compliance with ISO-9002 (Model for Quality Assurance in Production, Installation, and Servicing) and ISO-14001 (The application of well-accepted business management principles to the environment). The intent of this specification requirement is to ensure that the products from the manufacturer are delivered through a Quality System and Framework that will assure consistency in the products delivered for this project.

1.6 CODES & STANDARDS

- A. Work, materials, and equipment shall comply with the most restrictive of local, state, and federal authorities' codes and ordinances or these plans and specifications. As a minimum, the installation shall comply with current editions in effect 30 days prior to receipt of bids of the following codes:
 - 1. National Electric Code (NEC)
 - 2. International Building Code (IBC)
 - 3. International Mechanical Code (IMC)
 - 4. Local Building Code

1.7 SUBMITTALS

- A. Product Submittal Requirements. Meet requirements of Section 15100 on Shop Drawings, Product Data, and Samples. Provide six copies of shop drawings and other submittals on hardware, software, and equipment to be installed or furnished. Begin no work until submittals have been approved for conformity with design intent. Provide drawings as AutoCAD compatible files in electronic format (file format: .dwg, .dxf, .vsd, or comparable) or hard copies on 11 x 17 prints of each drawing. When manufacturer's cutsheets apply to a product series rather than a specific product, clearly indicate applicable data by highlighting or by other means. Clearly reference covered specification and drawing on each submittal. General catalogs shall not be accepted as cut sheets to fulfill submittal requirements. Select and show submittal quantities appropriate to scope of work.
- B. Provide submittals within 4 weeks of contract award.

C. Submittal data shall consist of the following:

1. Direct Digital Control System Hardware:

- a. Complete bill of materials indicating quantity, manufacturer, model number, and relevant technical data of equipment to be used.
- b. Manufacturer's description and technical data, such as product specification sheets, installation and maintenance instructions for items listed below and for relevant items not listed below:

- Direct Digital Controllers (controller panels)
- Transducers and Transmitters
- Sensors (including accuracy data)
- Valves
- Dampers
- Relays and Switches
- Control Panels
- Power Supplies
- Operator Interface Equipment

- c. Wiring diagrams and layouts for each control panel. Show all termination numbers.

2. Controlled Systems:

- Riser diagrams showing control network layout, communication protocol, and wire types.
- Schematic diagram of each controlled system. Label control points with point names. Graphically show locations of control elements.
- Schematic wiring diagram of each controlled system. Label control elements and terminals. Where a control element is also shown on control system schematic use the same name.
- Instrumentation list for each controlled system. List control system element in a table. Show element name, type of device, manufacturer, model number, and product data sheet number.
- Complete description of control system operation including sequences of operation. Include and reference schematic diagram of controlled system.
- Point list for each system controller including both inputs and outputs (I/O), point numbers, controlled device associated with each I/O point, and location of I/O device.
- Description of process, report formats and checklists to be used in the *Control System Demonstration and Acceptance* section in *PART 3 – EXECUTION* of this specification.

D. Contractor shall submit documentation in the following phased delivery schedule:

1. Valve and damper schedules
2. Point Naming Convention
3. Sample Graphics
4. System Schematics, including:
5. System Riser Diagrams
6. Sequence of Operations

7. Mechanical Control Schematics
 8. Electrical Wiring Diagrams
 9. Control Panel Layouts
 10. Product Specification Sheets
 11. As-Built drawings
- E. Project Record Documents: Submit three (3) copies of record (as-built) documents upon completion of installation. Submittal shall consist of:
 - F. Project Record Drawings. As-built versions of the submittal shop drawings provided as AutoCAD compatible files in electronic format and as 11 x 17 inch prints.
 - G. Testing and Commissioning Reports and Checklists. Completed versions of reports, checklists, and trend logs used to meet requirements in the *Control System Demonstration and Acceptance* section in *PART 3 – EXECUTION* of this specification.
 - H. Certification of pressure test required in the *Control Air Tubing* section in *PART 3 – EXECUTION* of this specification.
 - I. Operation and Maintenance (O & M) Manual.
 - J. As-built versions of the submittal product data.
 - K. Names, addresses, and 24-hour telephone numbers of installing contractors and service representatives for equipment and control systems.
 - L. Operator's Manual with procedures for operating control systems, logging on and off, handling alarms, producing point reports, trending data, overriding computer control, and changing setpoints and variables.
 - M. Programming manual or set of manuals with description of programming language and of statements for algorithms and calculations used, of point database creation and modification, of program creation and modification, and of editor use.
 - N. Engineering, installation, and maintenance manual or set of manuals that explains how to design and install new points, panels, and other hardware; how to perform preventive maintenance and calibration; how to debug hardware problems; and how to repair or replace hardware.
 - O. Documentation of all programs created using custom programming language, including setpoints, tuning parameters, and object database.
 - P. Graphic files, programs, and database on electronic media..
 - Q. List of recommended spare parts with part numbers and suppliers.
 - R. Complete original-issue documentation, installation, and maintenance information for furnished third-party hardware, including computer equipment and sensors.
 - S. Complete original original-issue copies of furnished software, including operating systems, custom programming language, operator workstation software, and graphics software.
 - T. Licenses, guarantees, and warranty documents for equipment and systems.

1.8 WARRANTY

- A. Warrant labor and materials for specified control system free from defects for a period of 12 months after final acceptance. Failures on control systems that include all computer equipment, transmission equipment and all sensors and control devices during warranty period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to Owner. Respond during normal business hours within 24 hours of Owner's warranty service request.
- B. Work shall have a single warranty date, even if Owner receives beneficial use due to early system start-up. If specified work is split into multiple contracts or a multi-phase contract, each contract or phase shall have a separate warranty start date and period.

- C. If Engineer determines that equipment and systems operate satisfactorily at the end of final start-up, testing, and commissioning phase, Engineer will certify in writing that control system operation has been tested and accepted in accordance with the terms of this specification. Date of acceptance shall begin warranty period.
- D. Provide updates to operator workstation software, project-specific software, graphic software, database software, and firmware that resolve Contractor identified software deficiencies at no charge during warranty period. If available, Owner can purchase in-warranty service agreement to receive upgrades for functional enhancements associated with the above-mentioned items. Do not install updates or upgrades without Owner's written authorization.
- E. Exception:
 - 1. Contractor shall not be required to warrant reused devices, except those that have been rebuilt or repaired. Installation labor and materials shall be warranted. Demonstrate operable condition of reused devices at time of Engineer's acceptance.
 - 2. Contractor shall not be required to warrant systems, equipment and devices or software if the damages and/or failures were caused by lack of training, unauthorized use, negligence or deliberate action of other parties, or job site conditions.

1.9 OWNERSHIP & PROPRIETARY MATERIAL

- A. Project specific software and documentation shall become Owner's property. This includes, but not limited to:
 - 1. Graphics
 - 2. Record drawings
 - 3. Database
 - 4. Application programming code
 - 5. Project Specific Documentation shall become Owner's property.
- B. General
 - 1. Submit two (2) draft copies of owner's manuals for review. After review by authorized representative, the contractor shall incorporate review comments and submit four (4) interim final copies.
 - 2. Submit four (4) copies of owner's manuals upon completion of project.
 - 3. Submit two (2) electronic copies of complete as-built documentation. All drawings shall be in standard AutoCad format, other documentation shall be in standard MS Office format.
 - 4. Update manuals with modifications made to system during guarantee period. Provide replacement pages or supplements in quantity stated above for "as-built" manuals.
 - 5. Assemble owner's manuals into multi-volume sets as necessary and required by the owner.
 - 6. Protect each volume with a binder. Volumes to have printed dividers between major sections and have oversized binders to accommodate up to 1/2-inch thick set of additional information.
 - 7. Each binder to be printed with project name and volume title on front cover and binder.
 - 8. On the first page of each manual identify the project name, manual title, owner's name, engineer's name, contractor's name, address and service phone number, and person who prepared manual.
 - 9. Operating manual to serve as training and reference manual for all aspects of day-to day operation of the system. As a minimum include the following:
 - 10. Sequence of operation for automatic and manual operating modes for all building systems. The sequences shall cross-reference the system point names.
 - 11. Description of manual override operation of all control points in system.

12. BMS system manufacturers complete operating manuals.
13. Provide maintenance manual to serve as training and reference manual for all aspects of day-to-day maintenance and major system repairs. As a minimum include the following:
14. Complete as-built installation drawings for each building system.
15. Overall system electrical power supply schematic indicating source of electrical power for each system component. Indicate all battery backup provisions.
16. Photographs and/or drawings showing installation details and locations of equipment.
17. Routine preventive maintenance procedures, corrective diagnostics troubleshooting procedures, and calibration procedures.
18. Parts list with manufacturer's catalog numbers and ordering information.
19. Lists of ordinary and special tools, operating materials supplies and test equipment recommended for operation and servicing.
20. Manufacturer's operation, set-up, maintenance and catalog literature for each piece of equipment.
21. Maintenance and repair instructions.
22. Recommended spare parts.
23. Provide Programming Manual to serve as training and reference manual for all aspects of system programming. As a minimum include the following:
24. Complete programming manuals, and reference guides.
25. Details of any custom software packages and compilers supplied with system.
26. Information and access required for independent programming of system.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. All products used in this project installation shall be new and currently manufactured and shall have been applied in similar installations. Do not use this installation as a product test site unless explicitly approved in writing by Owner or Owner's representative. Spare parts shall be available for at least five years after completion of this contract.

2.2 COMMUNICATION

- A. The design of the BMS shall support networking of operator workstations and Building Controllers. The network architecture shall consist of two levels, an Ethernet based primary network for all operator workstations, servers, and primary DDC controllers along with secondary Floor Level Networks (FLN) for terminal equipment application specific controllers.
- B. Access to system data shall not be restricted by the hardware configuration of the building management system. The hardware configuration of the BMS network shall be totally transparent to the user when accessing data or developing control programs.
- C. Primary Network - Panel to Panel Communication:
 1. All Building Controllers shall directly reside on the primary Ethernet network so that communications may be executed directly between Building Controllers, directly between server and Building Controllers on a peer-to-peer basis.
 2. Systems that operate via polled response or other types of protocols that rely on a central processor, file server, or similar device to manage panel-to-panel or device-to-device communications shall not be acceptable.

3. All operator interfaces shall have the ability to access all point status and application report data or execute control functions for any and all other devices. Access to data shall be based upon logical identification of building equipment. No hardware or software limits shall be imposed on the number of devices with global access to the network data.
- D. The primary network shall use TCP/IP over Ethernet. All devices must:
1. Auto-sense 10/100 Mbps networks.
 2. Receive an IP Address from a Dynamic Host Configuration Protocol (DHCP) Server or be configured with a Fixed IP Address.
 3. Resolve Name to IP Addresses for devices using a Domain Name Service (DNS) Server on the Ethernet network.
 4. Allow MMI access to an individual Primary Network Controller using industry standard Telnet software to view and edit entire Primary Network.
 5. The primary network shall provide the following minimum performance:
 6. Provide high-speed data transfer rates for alarm reporting, report generation from multiple controllers and upload/download efficiency between network devices. System performance shall insure that an alarm occurring at any Building Controller is displayed at any PC workstations, all Building Controllers, and other alarm printers within 15 seconds.
 7. Message and alarm buffering to prevent information from being lost.
 8. Error detection, correction, and re-transmission to guarantee data integrity.
 9. Synchronization of real-time clocks between Building Controllers, including automatic daylight savings time corrections.
 10. The primary network shall allow the Building Controllers to access any data from, or send control commands and alarm reports directly to, any other Building Controller or combination of controllers on the network without dependence upon a central or intermediate processing device. Building Controllers shall send alarm reports to multiple operator workstations without dependence upon a central or intermediate processing device. The network shall also allow any Building Controller to access, edit, modify, add, delete, back up, restore all system point database and all programs.
 11. The primary network shall allow the Building Controllers to assign password access and control priorities to each point individually. The logon password (at any PC workstation or portable operator terminal) shall enable the operator to monitor, adjust and control only the points that the operator is authorized for. All other points shall not be displayed at the PC workstation or portable terminal. (e.g., all base building and all tenant points shall be accessible to any base building operators, but only certain base building and tenant points shall be accessible to tenant building operators). Passwords and priorities for every point shall be fully programmable and adjustable.
 12. Devices containing custom programming must reside on the Primary Network.
- E. Secondary Network – Application Specific Controller Communication:
1. Communication over the secondary network shall be BACnet MS/TP protocol.
 2. This level communication shall support a family of application specific controllers for terminal equipment.
 3. The Application Specific Controllers shall communicate bi-directionally with the primary network through Building Controllers for transmission of global data.
 4. A maximum of 50 terminal equipment controllers may be configured on individual secondary networks to ensure adequate global data and alarm response times.

2.3 BUILDING CONTROLLER SOFTWARE

- A. Furnish the following applications software to form a complete operating system for building and energy management as described in this specification.
- B. The software programs specified in this Section shall be provided as an integral part of Building Controllers and shall not be dependent upon any higher level computer or another controller for execution.
- C. All points, panels and programs shall be identified by a 30-character name. All points shall also be identified by a 16-character point descriptor. The same names shall be displayed at both Building Controller and the Operator Interface.
- D. All digital points shall have a user defined two-state status indication with 8 characters minimum (e.g., Summer, Enabled, Disabled, Abnormal).
- E. Building Controllers shall have the ability to perform energy management routines including but not limited to time of day scheduling, calendar-based scheduling, holiday scheduling, temporary schedule overrides, start stop time optimization, automatic daylight savings time switch over, night setback control, enthalpy switch over, peak demand limiting, temperature-compensated duty cycling, heating/cooling interlock, supply temperature reset, priority load shedding, and power failure restart.
- F. The Building Controllers shall have the ability to perform the following pre tested control algorithms:
 - 1. Two position control
 - 2. Proportional control
 - 3. Proportional plus integral control
 - 4. Proportional, integral, plus derivative control
 - 5. Automatic tuning of control loops
 - 6. Model-Free Adaptive Control
- G. Each controller shall be provided with an interactive HELP function to assist operators using POTs and remote connected operators.

2.4 SYSTEM SECURITY

- A. User access shall be secured using individual security passwords and user names.
- B. Passwords shall restrict the user to the objects, applications, and system functions as assigned by the system manager.
- C. User Log On/Log Off attempts shall be recorded.
- D. The system shall protect itself from unauthorized use by automatically logging off following the last keystroke. The delay time shall be user-definable.
- E. Use of workstation resident security as the only means of access control is not an acceptable alternative to resident system security in the field panel.

2.5 USER DEFINED CONTROL APPLICATIONS

- A. Controllers shall be able to execute custom, job-specific processes defined by the user, to automatically perform calculations and special control routines.
- B. It shall be possible to use any system measured point data or status, any system calculated data, a result from any process, or any user-defined constant in any controller in the system.
- C. Any process shall be able to issue commands to points in any and all other controllers in the system.
- D. Processes shall be able to generate operator messages and advisories to other operator I/O devices. A process shall be able to directly send a message to a specified device or cause the execution of a dial-up connection to a remote device such as a printer or pager.

- E. Each controller shall support plain language text comment lines in the operating program to allow for quick troubleshooting, documentation, and historical summaries of program development.
- F. Controller shall provide a HELP function key, providing enhanced context sensitive on-line help with task oriented information from the user manual.

2.6 ALARM MANAGEMENT

- A. Alarm management shall be provided to monitor and direct alarm information to operator devices. Each Building Controller shall perform distributed, independent alarm analysis and filtering to minimize operator interruptions due to non-critical alarms, minimize network traffic and prevent alarms from being lost. At no time shall the Building Controllers ability to report alarms be affected by either operator or activity at a PC workstation, local I/O device or communications with other panels on the network.
- B. Conditional alarming shall allow generation of alarms based upon user defined multiple criteria.
- C. An Alarm "shelving" feature shall be provided to disable alarms during testing. (Pull the Plug, etc.).
- D. Binary Alarms. Each binary object shall be set to alarm based on the operator-specified state. Provide the capability to automatically and manually disable alarming.
- E. Analog Alarms. Each analog object shall have both high and low alarm limits. Alarming must be able to be automatically and manually disabled.
- F. All alarm or point change reports shall include the point's user defined language description and the time and date of occurrence.
- G. The user shall be able to define the specific system reaction for each point. Alarms shall be prioritized to minimize nuisance reporting and to speed operator response to critical alarms. A minimum of six priority levels shall be provided for each point. Point priority levels shall be combined with user definable destination categories (PC, printer, Building Controller, etc.) to provide full flexibility in defining the handling of system alarms. Each Building Controller shall automatically inhibit the reporting of selected alarms during system shutdown and start-up. Users shall have the ability to manually inhibit alarm reporting for each point.
- H. Alarm reports and messages shall be routed to user-defined list of operator workstations, or other devices based on time and other conditions. An alarm shall be able to start programs, print, be logged in the event log, generate custom messages, and display graphics.
- I. In addition to the point's descriptor and the time and date, the user shall be able to print, display or store a 200-character alarm message to more fully describe the alarm condition or direct operator response.
- J. Each Building Controller shall be capable of storing a library of at least 50 alarm messages. Each message may be assigned to any number of points in the Controller.
- K. Operator-selected alarms shall be capable of initiating a call to a remote operator device.

2.7 SCHEDULING

- A. Provide a comprehensive menu driven program to automatically start and stop designated object or group of objects in the system according to a stored time.
- B. Schedules shall reside in the building controller and shall not rely on external processing or network.
- C. It shall be possible to define a group of objects as a custom event (i.e., meeting, athletic activity, etc.). Events can then be scheduled to operate all necessary equipment automatically.
- D. For points assigned to one common load group, it shall be possible to assign variable time delays between each successive start and/or stop within that group.
- E. The operator shall be able to define the following information:

1. Time, day

2. Commands such as on, off, auto, etc.
 3. Time delays between successive commands.
- F. There shall be provisions for manual overriding of each schedule by an authorized operator.
- G. It shall be possible to schedule calendar-based events up to one year in advance based on the following:
1. Weekly Schedule. Provide separate schedules for each day of the week. Each of these schedules should include the capability for start, and stop, optimal start, optimal stop, and night economizer. When a group of objects are scheduled together as an Event, provide the capability to adjust the start and stop times for each member.
 2. Exception Schedules. Provide the ability for the operator to designate any day of the year as an exception schedule. Exception schedules may be defined up to a year in advance. Once an exception schedule is executed, it will be discarded and replaced by the standard schedule for that day of the week.
 3. Holiday Schedules. Provide the capability for the operator to define up to 99 special or holiday schedules. These schedules may be placed on the scheduling calendar and will be repeated each year. The operator shall be able to define the length of each holiday period.
 4. Automatic Daylight Savings Time Switchover: The system shall provide automatic time adjustment for switching to/from Daylight Savings Time.
 5. Night setback control. The system shall provide the ability to automatically adjust setpoints for night control.
 6. Loop Control. A Model-Free Adaptive Control algorithm or alternatively a PID (proportional-integral-derivative) closed-loop control algorithm with direct or reverse action and anti-windup shall be supplied. The algorithm shall calculate a time-varying analog value that is used to position an output or stage a series of outputs. The controlled variable, setpoint, and weighting parameters shall be user-selectable.
 7. Sequencing. Provide application software based upon the sequences of operation specified to properly sequence equipment.
- H. Staggered Start
1. This application shall prevent all controlled equipment from simultaneously restarting after a power outage. The order in which equipment (or groups of equipment) is started, along with the time delay between starts, shall be user definable.
 2. Upon the resumption of power, each Building Controller shall analyze the status of all controlled equipment, compare it with normal occupancy scheduling and turn equipment on or off as necessary to resume normal operations.
- I. Totalization
1. Run-Time Totalization. Building Controllers shall automatically accumulate and store run-time hours for all digital input and output points. A high runtime alarm shall be assigned, if required, by the operator.
 2. Consumption totalization. Building Controllers shall automatically sample, calculate and store consumption totals on a daily, weekly or monthly basis for all analog and digital pulse input type points.
 3. Event totalization. Building Controllers shall have the ability to count events such as the number of times a pump or fan system is cycled on and off. Event totalization shall be performed on a daily, weekly or monthly basis for all points. The event totalization feature shall be able to store the records associated with events before reset.
- J. Data Collection

1. A variety of historical data collection utilities shall be provided to manually or automatically sample, store, and display system data for all points.
2. Building Controllers shall store point history data for selected analog and digital inputs and outputs:
3. Any point, physical or calculated may be designated for trending. Any point, regardless of physical location in the network, may be collected and stored in each Building Controllers point group.
4. Trend data shall be stored at the Building Controllers and uploaded to the workstation when retrieval is desired. Uploads shall occur based upon either user-defined interval, manual command or when the trend buffers are full. All trend data shall be available for use in third-party personal computer applications.
5. Loop Tuning. Building Controllers shall also provide high resolution sampling capability for verification of DDC control loop performance. Documented evidence of tuned control loop performance shall be provided on a <monthly, seasonal, quarterly, annual> period.
6. For Model-Free Adaptive Control loops, evidence of tuned control loop performance shall be provided via graphical plots or trended data logs. Graphical plots shall minimally include depictions of setpoint, process variable (output), and control variable (e.g., temperature). Other parameters that may influence loop control shall also be included in the plot (e.g., fan on/off, mixed-air temperature).
7. For PID control loops, operator-initiated automatic and manual loop tuning algorithms shall be provided for all operator-selected PID control loops. Evidence of tuned control loop performance shall be provided via graphical plots or trended data logs for all loops.
8. In automatic mode, the controller shall perform a step response test with a minimum one-second resolution, evaluate the trend data, calculate the new PID gains and input these values into the selected LOOP statement.
9. Loop tuning shall be capable of being initiated either locally at the Building Controller, from a network workstation or remotely using dial-in modems. For all loop tuning functions, access shall be limited to authorized personnel through password protection.

2.8 BUILDING CONTROLLERS

- A. Building Controllers shall be 32-bit, multi-tasking, multi-user, real-time 100 MHz digital control processors consisting of modular hardware with plug-in enclosed processors, communication controllers, power supplies and input/output point modules. Controller size shall be sufficient to fully meet the requirements of this specification and the attached point list.
- B. Each Building Controller shall have sufficient memory, a minimum of 24 megabyte, to support its own operating system and databases, including control processes, energy management applications, alarm management applications, historical/trend data for points specified, maintenance support applications, custom processes, operator I/O, and dial-up communications.
- C. Provide Universal I/O capability, including software configurable universal inputs and universal outputs.
- D. Each Building Controller shall support a minimum of one directly connected Secondary Network.
- E. Building Controller shall have an integral real-time clock.
- F. Each Building Controller shall support firmware upgrades without the need to change hardware.
- G. Each Building Controller shall support:
 1. Monitoring of industry standard analog and digital inputs, without the addition of equipment outside the Building Controller cabinet.
 2. Monitoring of industry standard analog and digital outputs, without the addition of equipment outside the Building Controller cabinet.

3. Spare Point Capacity.
- H. Each Building Controller shall have a minimum of 10 percent spare point capacity.
 - I. The type of spares shall be in the same proportion as the implemented I/O functions of the panel, but in no case shall there be less than one spare of each implemented I/O type.
 - J. Provide all processors, power supplies, and communication controllers so that the implementation of adding a point to the spare point location only requires the addition of the appropriate:
 1. Expansion modules
 2. Sensor/actuator
 3. Field wiring/tubing
 - K. Serial Communication. Building Controllers shall provide at least two EIA-232C serial data communication ports for operation of operator I/O devices such as industry standard printers, operator terminals, and portable laptop operator's terminals. Building Controllers shall allow temporary use of portable devices without interrupting the normal operation of permanently connected printers or terminals.
 - L. I/O Status and Indication. Building Controllers shall provide local LED status indication for each digital input and output for constant, up-to-date verification of all point conditions without the need for an operator I/O device. Graduated intensity LEDs or analog indication of value shall also be provided for each analog output. All wiring connections shall be made to field-removable terminals.
 - M. Shall provide I/O modules with LCD's capable of displaying information faults including but not limited to open circuit, short circuit, unreliable input signal, signal under range, and signal over range via informative symbols.
 - N. Self Diagnostics. Each Building Controller shall continuously perform self diagnostics, communication diagnosis, and diagnosis of all panel components. The Building Controller shall provide both local and remote annunciation of any detected component failures, low battery conditions or repeated failure to establish communication for any system.
 - O. Power loss. In the event of the loss of power, there shall be an orderly shutdown of all Building Controllers to prevent the loss of database or operating system software. Non-volatile memory shall be incorporated for all critical controller configuration data and battery backup shall be provided to support the real-time clock and all volatile memory for a minimum of 30 days..
 - P. Environment.
 1. Controller hardware shall be suitable for the anticipated ambient conditions.
 2. Controllers used outdoors and/or in wet ambient conditions shall be mounted within waterproof enclosures and shall be rated for operation at 0°C to 49°C (32°F to 120°F).
 3. Controllers used in conditioned space shall be mounted in dust-proof enclosures and shall be rated for operation at 0°C to 49°C (32°F to 120°F).
 - Q. Immunity to power and noise.
 - R. Controller shall be able to operate at 90% to 110% of nominal voltage rating and shall perform an orderly shutdown below 80% nominal voltage.
 - S. Operation shall be protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W at 1 m (3 ft).
 - T. Isolation shall be provided at all primary network terminations, as well as all field point terminations to suppress induced voltage transients consistent with:
 1. RF-Conducted Immunity (RFCI) per ENV 50141 (IEC 1000-4-6) at 3V
 2. Electro Static Discharge (ESD) Immunity per EN 61000-4-2 (IEC 1000-4-2) at 8 kV air discharge, 4 kV contact

3. Electrical Fast Transient (EFT) per EN 61000-4-4 (IEC 1000-4-4) at 500V signal, 1 kV power
 4. Output Circuit Transients per UL 864 (2,400V, 10A, 1.2 Joule max)
- U. Isolation shall be provided at all Building Controller's AC input terminals to suppress induced voltage transients consistent with:
1. IEEE Standard 587 1980
 2. UL 864 Supply Line Transients
 3. Voltage Sags, Surge, and Dropout per EN 61000-4-11 (EN 1000-4-11)
- V. Local Controller Interface. A local user interface to the controller shall be provided. The interface may be mounted on any building controller and automatically read and initiate commands of local database points without further set-up or configuration. The Controller Interface shall be provided for interrogating and editing data, commanding point values at user defined priorities, viewing and acknowledging alarms, and viewing point monitoring reports. An optional system security password shall be available to prevent unauthorized use of the local controller interface and display.
- W. Minimum Approved Building Controllers.
- X. BMS Contractors shall furnish Building Controllers as listed below. Providing an approved controller does not release the contractor from meeting all performance, software and hardware specifications for Building Controllers and system operations.
- Y. Siemens Industry, Inc. - PXC Compact Controllers, PXC Modular Controllers.

2.9 APPLICATION SPECIFIC CONTROLLERS (ASC)

- A. Provide for control of each piece of equipment, including, but not limited to the following:
1. Fan Coil Units
 2. VAV Terminal Units
 3. CV Terminal Units
- B. Each Application Specific Controller shall support:
1. Each Building Controller shall be able to communicate with application specific controllers (ASCs) over the Secondary Network to control terminal equipment only.
 2. Each ASC shall operate as a stand-alone controller capable of performing its specified control responsibilities independently of other controllers in the network. Each ASC shall be a microprocessor-based, multi-tasking, real-time digital control processor.
 3. Each ASC shall include all point inputs and outputs necessary to perform the specified control sequences. The ASC shall accept input and provide output signals that comply with industry standards. Controllers utilizing proprietary control output signals shall not be acceptable. Outputs utilized either for two-state, modulating floating, or proportional control, allowing for additional system flexibility.
 4. Space Temperature Sensors. Each controller performing space temperature control shall be provided with a matching room temperature sensor.
 5. Wired temperature sensor specifications. The sensing element for the space temperature sensor must be IC-based and provide the following.
 6. Digitally communicating with the Application Specific Controller.
 7. Mountable to and fully covering a 2 x 4 electrical junction box without the need for an adapter wall plate.
 - a. IC Element Accuracy: +/- 0.9°F
 - b. Operating Range: 55 to 95°F

- c. Setpoint Adjustment Range: User limiting, selectable range between 55 and 95°F
 - d. Display of temperature setpoint with numerical temperature values
 - e. Calibration: Single point, field adjustable at the space sensor to +/- 5°F
 - f. Installation: Up to 100 ft. from controller
 - g. Auxiliary Communications Port: included
 - h. Local OLED Temperature Display: included
 - i. Display of Temperature to one decimal place
 - j. Temperature Setpoint Adjustment: included
 - k. Occupancy Override Function included
 - l. Setpoint Modes:
 - m. Independent Heating, Cooling
 - n. Night Setback-Heating
 - o. Night Setback-Cooling
8. Auxiliary Communication Port. Each room temperature sensor shall include a terminal jack integral to the sensor assembly. The terminal jack shall be used to connect a portable operator's terminal to control and monitor all hardware and software points associated with the controller. RS-232 communications port shall allow the operator to query and modify operating parameters of the local room terminal unit from the portable operator's terminal.
 9. Setpoint Adjustment Dial. The setpoint adjustment function dial shall allow for modification of the temperature by the building operators. Setpoint adjustment may be locked out, overridden, or limited as to time or temperature through software by an authorized operator at any central workstation, Building Controller, room sensor two-line display, or via the portable operator's terminal.
 10. Override Switch. An override button shall initiate override of the night setback mode to normal (day) operation when activated by the occupant and enabled by building operators. The override shall be limited to two (2) hours (adjustable.) The override function may be locked out, overridden, or limited through software by an authorized operator at the operator interface, Building Controller, room sensor two-line display or via the portable operator's terminal.
 11. Space Combination Temperature and Humidity Sensors. Each controller performing space temperature control shall be provided with a matching room temperature sensor, which also includes the ability to measure humidity for either monitoring or control purposes. The combination temperature and humidity sensors shall have the same appearance as the space temperature sensors. Humidity elements shall measure relative humidity with a +/- 2% accuracy over the range of 10 to 90% relative humidity. Humidity element shall be an IC (integrated circuit) sensing element. Humidity sensing elements shall be removable and field replaceable if needed.
 12. Communication. Each controller shall perform its primary control function independent of other Secondary Network communication, or if Secondary Network communication is interrupted. Reversion to a fail-safe mode of operation during Secondary Network interruption is not acceptable.
 13. Control Algorithms. The controller shall receive its real-time data from the Building Controller time clock to ensure Secondary Network continuity. Each controller shall include algorithms incorporating proportional, integral and derivative (PID) gains for all applications. All PID gains and biases shall be field-adjustable by the user via room sensor LCD or the portable operator's terminal as specified herein. Controllers that incorporate proportional and integral (PI) control algorithms only shall not be acceptable.

14. Control Applications. Operating programs shall be field-selectable for specific applications. In addition, specific applications may be modified to meet the user's exact control strategy requirements, allowing for additional system flexibility. Controllers that require factory changes of all applications are not acceptable.
15. Programmability. Application Specific Controllers shall be programmable, using software provided by the BMS manufacturer. Software shall be field-installable on any standard laptop or Portable Operator's Terminal. Program language shall be text-based and allow up to 200 lines of code for programming. Programming shall allow for changing sequence of operation, commanding and releasing points, additional monitoring, and command priority management within the Application Specific Controller.

C. Memory:

1. Provide each ASC with sufficient memory to accommodate point databases, operating programs, local alarming and local trending. All databases and programs shall be stored in non-volatile EEPROM, EPROM and PROM, or minimum of 72-hour battery backup shall be provided. The controllers shall be able to return to full normal operation without user intervention after a power failure of unlimited duration.
2. Upon replacement, new ASCs shall recover control function and site specific defaults automatically and resume normal operation.
3. Power Supply. The ASCs shall be powered from a 24 Vac source and shall function normally under an operating range of 18 to 28 Vac, allowing for power source fluctuations and voltage drops. Power supply for the ASC must be rated at a minimum of 125% of ASC power consumption and shall be of the fused or current limiting type. The BMS contractor shall provide 24 Vac power to the terminal units by utilizing:
4. The existing line voltage power trunk and installing separate isolation transformers for each controller.
5. Dedicated line voltage power source and isolation transformers at a central location and installing 24 Vac power trunk to supply multiple ASCs in the area.
6. Environment. The controllers shall function normally under ambient conditions of 32 to 122°F (0 to 50°C) and 10% to 95% rh (non-condensing). Provide each controller with a suitable cover or enclosure to protect the circuit board assembly.
7. Immunity to noise. Operation shall be protected against electrical noise of 5-120 Hz and from keyed radios up to 5 W at 1 m (3 ft).

2.10 INPUT/OUTPUT INTERFACE

- A. Hardwired inputs and outputs may tie into the system through building or application specific controllers.
- B. Modular, "hot-swappable" I/O so that the electronics of a small portion of the I/O can be replaced without effecting the power or communication for the other points.
- C. All input points and output points shall be protected such that shorting of the point to itself, to another point, or to ground will cause no damage to the controller. All input and output points shall be protected from voltage up to 24V of any duration, such that contact with this voltage will cause no damage to the controller.
- D. Binary inputs shall allow the monitoring of On/Off signals from remote devices. The binary inputs shall provide a wetting current of at least 12 mA to be compatible with commonly available control devices and shall be protected against the effects of contact bounce and noise. Binary inputs shall sense "dry contact" closure without external power (other than that provided by the controller) being applied.
- E. Pulse accumulation input objects. This type of object shall conform to all the requirements of binary input objects and also accept up to ten (10) pulses per second for pulse accumulation.

- F. Analog inputs shall allow the monitoring of low-voltage (0 to 10 Vdc), current (4 to 20 mA), or resistance signals (thermistor, RTD). Analog inputs shall be compatible with—and field configurable to—commonly available sensing devices.
- G. 24 Vdc shall be available next to the point signal for powering the output device.
- H. Binary outputs shall provide for On/Off operation or a pulsed low-voltage signal for pulse width modulation control. Binary outputs on building and custom application controllers shall have three-position (On/Off/Auto) override switches and status lights. Outputs shall be selectable for either normally open or normally closed operation.
- I. Analog outputs shall provide a modulating signal for the control of end devices. Outputs shall provide either a 0 to 10 Vdc or 4 to 20 mA signal as required to provide proper control of the output device. Analog outputs on building or custom application controllers shall have status lights and manual override. Analog outputs shall not exhibit a drift of greater than 0.4% of range per year.
- J. Tri-State Outputs. Provide tri-state outputs (two coordinated binary outputs) for control of three-point floating type electronic actuators without feedback. Use of three-point floating devices shall be limited to zone control and blower coil unit control applications (Blower Coil units, duct-mounted heating coils, zone dampers, radiation, etc.). Control algorithms shall run the zone actuator to one end of its stroke once every 24 hours for verification of operator tracking.
- K. Point name labels. It shall be possible to print customized name labels for each I/O point and install on an existing holder on the I/O device.
- L. System Object Capacity. The system size shall be expandable to at least twice the number of input/ output objects required for this project. Additional controllers (along with associated devices and wiring) shall be all that is necessary to achieve this capacity requirement. The operator interfaces installed for this project shall not require any hardware additions or software revisions in order to expand the system.

2.11 POWER SUPPLIES & LINE FILTERING

- A. Control transformers shall be UL listed. Furnish Class 2 current-limiting type or furnish over-current protection in both primary and secondary circuits for Class 2 service in accordance with NEC requirements. Limit connected loads to 80% of rated capacity.
- B. DC power supply output shall match output current and voltage requirements. Unit shall be full-wave rectifier type with output ripple of 5.0 mV maximum peak-to-peak. Regulation shall be 1.0% line and load combined, with 100-microsecond response time for 50% load changes. Unit shall have built-in over-voltage and over-current protection and shall be able to withstand a 150% current overload for at least three seconds without trip-out or failure.
- C. Unit shall operate between 0°C and 50°C (32°F and 120°F). EM/RF shall meet FCC Class B and VDE 0871 for Class B and MILSTD 810C for shock and vibration.
- D. Line voltage units shall be UL recognized and CSA approved.
- E. Power line filtering.
- F. Provide transient voltage and surge suppression for all workstations and controllers either internally or as an external component. Surge protection shall have the following at a minimum:
- G. Dielectric strength of 1000 volts minimum
- H. Response time of 10 nanoseconds or less
- I. Transverse mode noise attenuation of 65 dB or greater
- J. Common mode noise attenuation of 150 dB or better at 40 Hz to 100 Hz.

2.12 AUXILIARY CONTROL DEVICES

- A. Specified in this section are the following hard wired input/output devices connected to the Building Controller or ASC.
 - 1. Automatic Dampers
 - 2. Electric Damper Actuators
 - 3. Binary Temperature Devices
 - 4. Temperature Sensors
 - 5. Dew Point/Humidity Sensors
 - 6. Indoor Air Quality (CO2/TEMP/RH) Space Sensors
 - 7. Current Switches
 - 8. Local Control panels
- B. Specified in this section are the following devices connected to the BMS using secondary network communication.
 - 1. Indoor Air Quality (CO2) Space Sensors
 - 2. Power Monitors
 - 3. Automatic Dampers
- C. Dampers shall have 13 gauge galvanized frames of not less than 3 inches wide and blades of 14 gauge, equivalent thickness, galvanized steel roll formed airfoil type for low pressure drop and low noise generation and shall be adequately braced to form a rigid assembly where required in galvanized duct work. Dampers shall have blades not more than 8 inches wide. Linkage and hardware shall be zinc plated steel and shall be concealed out of airstream within the damper frame. Damper blades and rods shall be installed in horizontal position.
- D. In copper, aluminum and stainless steel duct work, damper material shall match the duct work material.
- E. All dampers shall be of the proportioning or opposed blade type, and shall be motor operated. Dampers shall have continuous elastomer or stainless steel stops to avoid leakage. Bearings shall be corrosion resistant oil tight stainless steel sleeve type. All dampers shall be provided with continuous 3/16" x 1/2" closed cell neoprene gasket around perimeter of the frame and at interlocking blade edges to form an air tight seal. Blade seals shall be suitable for -76°F to 350°F mechanically locked into blade edge. Adhesive or clip on type are not acceptable. Axles shall be square or hexagonal positively locked into damper blade. Linkage shall be concealed out of airstream within the damper blade.
- F. All dampers shall be constructed to provide a maximum leakage of 3-1/2%, with an approach velocity of 1500 fpm when closed against a pressure of 4 inches of water. Submit leakage and flow characteristic data for all dampers.
- G. All outside air dampers, with the exception of the emergency generator dampers, shall automatically close in the event of a loss of power. Dampers on emergency generators shall automatically open on a loss of power.
- H. Dampers shall be Greenheck, Imperial Model 800 or approved equal.
- I. Dampers shall be Ruskin Model CD60, Imperial Model 800 or approved equal.
- J. Electric Damper Actuators
 - 1. General
 - a. All actuators shall be manufactured; brand labeled, or distributed by Siemens.
 - b. All damper actuators having more than 100 lb-in torque output shall have a self-centering damper shaft clamp. V-bolt type damper shaft clamp is not acceptable.

- c. The actuator shall have mechanical or electronic stall protection to prevent damage to the actuator throughout the rotation of the actuator.
 - d. Where shown, for power-failure/safety applications, an internal mechanical, spring-return mechanism shall be built into the actuator housing. Alternatively, an uninterruptible power supply (UPS) may be provided.
 - e. Modulating actuator shall accept a 0-10 Vdc control signal and provide a 0-10 Vdc operating range.
 - f. All 24 Vac/Vdc actuators shall operate on Class 2 wiring.
 - g. All actuators over 20 lb-in torque capacity shall have an external manual gear release to allow manual positioning of the damper when the actuator is not powered and spring-return actuators shall have a manual crank for this purpose.
 - h. Upon start up and after power loss, the actuator must immediately respond to control signals. Actuators requiring calibration to determine end stops are not acceptable.
 - i. Electric actuators for emergency generator damper control shall be rated for 350°F. maximum operating temperature and capable to drive fully open and close within 15 seconds.
 - j. All actuators that provide a factory mounted electrical appliance or plenum rated cabling must be marked with numbers on the wires as well as color coded.
 - k. Provide built-in dual end switches as required for the sequence of operation.
 - l. Control damper actuators shall be RoHS Part A compliant.
2. Binary temperature devicesID: 319]
- a. Line-voltage space thermostat:
 - Line-voltage thermostats shall be bimetal-actuated, snap acting SPDT contact, enclosed, UL Listed for electrical rating. The thermostat cover shall provide exposed setpoint adjustment knob. The thermostat shall operate within the 55°F to 85°F setpoint range, with 2°F maximum differential.
 - b. Temperature sensors .
 - Provide the following instrumentation as required by the monitoring, control and optimization functions. All temperature sensors shall use platinum RTD elements only, except for those connected to application specific controllers via RJ-11 connector.
 - c. Room Temperature:
 - Temperature monitoring range +40/+90°F (+40/120°F for high temp alarms)
 - Installation adjustments none required
 - Calibration adjustments none required
 - Factory calibration point 32°F
 - Accuracy at calibration point +/- 0.7°F
 - d. Duct (Single Point) Temperature
 - Temperature monitoring range +20/+120°F or +30/+250°F
 - Installation adjustments none required
 - Calibration adjustments none required
 - Factory calibration point 70°F

- Accuracy at calibration point +/- 0.54°F
- e. Duct (Averaging) Temperature
 - Temperature monitoring range +20/+120°F
 - Installation adjustments none required
 - Calibration adjustments none required
 - Factory calibration point 32°F
 - Accuracy at calibration point +/- 0.54°F
- f. Outside Air Temperature
 - Temperature monitoring range -58/+122°F
 - Installation adjustments none required
 - Calibration adjustments none required
 - Factory calibration point 70°F
 - Accuracy at calibration point +/- 0.54°F
- 3. Dew point/humidity sensors
 - a. Outside Air Dew Point Temperature
 - Dew point monitoring range -40/+115°F DP, 12% to 99% rh
 - Output signal 4-20 mA
 - Calibration adjustments zero and span
 - Factory calibration point 70°F
 - Accuracy at calibration point +/- 2.0°F DP
 - b. Room/duct Relative Humidity
 - Sensor Humidity range 0 to 100%
 - Operating temperature 15°F to +170°F
 - Accuracy +2% rh
 - Sensing element Capacitive sensor
 - Output signal 4-20 mA DC
 - Installation adjustments none required
 - Operating temperature 15°F to +170°F
 - Voltage requirement 12-36 Vdc
- 4. Indoor air quality (CO2/TEMP/RH) sensors
 - a. Provide indoor air quality sensors to monitor Carbon Dioxide (CO2), and /or Temperature and Humidity.
 - b. The CO2 sensor shall be of microprocessor-based non-dispersive infrared type (NDIR) with an additional integrated reference light source.
 - c. The CO2 sensors shall have no more than 1% drift during the first year of operation and minimal drift thereafter so that no calibration will be required.
 - d. The units shall be wall or duct mounted type as indicated on plans and in the sequence of operation.

- e. Wall mounted sensors shall be provided with white plastic cover, without LED indicators.
- f. Duct and Wall mounted sensors shall be suitable for zones with 24/7 occupancy
- g. Duct and Wall mounted sensors with Temperature shall have an option for active or passive temperature outputs (based on part number)
- h. Duct mounted sensors shall be provided without the need for a separate aspirator box
- i. The sensor shall meet the following requirements:
 - Operating voltage: 24 Vac +/- 20%, or 15 to 35Vdc
 - Frequency: 50/60 Hz
 - Power consumption: max. 6 VA
 - CO2 measuring range: 0 – 2000 ppm
 - Tolerance: +/- 50 ppm
 - Output: 0 - 10 Vdc or 0 - 5 Vdc Field configurable
 - Output (passive T, selectable) pt100, pt1000, Ni1000, NTC 10K
 - Calibration: none required
 - Permissible air velocity in duct: <26.2 ft/s.
- 5. Cooler/freezer temperature sensors shall be monitored by BAS. The Controls Contractor is to provide and install temperature sensors for the coolers and freezers. Sensors should be tied back to BAS/Tridium Graphical Webserver to monitor and alarm if temperatures exceed the acceptable range.
- 6. Current switches
 - a. Current-operated switches shall be self-powered, solid-state with adjustable trip current. The switches shall be selected to match the current of the application and output requirements of the DDC system.
- 7. Local control panels
 - a. All indoor control cabinets shall be fully enclosed NEMA 1 construction with (hinged door) key-lock latch and removable sub panels. A single key shall be common to all field panels and sub panels.
 - b. Interconnections between internal and face mounted devices shall be prewired with color-coded stranded conductors neatly installed in plastic troughs and/or tie-wrapped. Terminals for field connections shall be UL Listed for 600 volt service, individually identified per control/ interlock drawings, with adequate clearance for field wiring. Control terminations for field connection shall be individually identified per control drawings.
 - c. Provide ON/OFF power switch with overcurrent protection for control power sources to each local panel.

2.13 COMMUNICATION & WIRING CONTROL

- A. Provide copper wiring, plenum cable, and raceways as specified in the applicable sections of Division 16 unless otherwise noted herein.
- B. All insulated wire to be copper conductors, UL labeled for 90°C minimum service.
- C. Wire Sizing and Insulation
- D. Wiring shall comply with minimum wire size and insulation based on services listed below:

<u>Service</u>	<u>Minimum Gage/Type</u>	<u>Insulation Class</u>
AC 24V Power	12 Ga Solid	600 Volt
DC 24V Power	10 Ga Solid	600 Volt
Class 1	14 Ga Stranded	600 Volt
Class 2	18 Ga Stranded	300 Volt
Class 3	18 Ga Stranded	300 Volt

E. Provide plenum-rated cable when open cable is permitted in supply or return air plenum where allowed per execution specifications defined in *Paragraph 3.07 – Wiring* of this specification.

F. Power Wiring:

1. 115V power circuit wiring above 100 feet distance shall use minimum 10 gage.
2. 24V control power wiring above 200 feet distance shall use minimum 12 gage.

G. Control Wiring:

1. Digital Input/Output wiring shall use Class 2 twisted pair, insulated.
2. Analog inputs shall use Class 2 twisted shielded pair, insulated and jacketed and require a grounded shield.
3. Actuators with tri-state control shall use 3 conductor with same characteristics

H. Communication Wiring

1. Ethernet Cable shall be minimum CAT5.
2. Secondary level network shall be 24 gage, TSP, low capacitance cable.
3. Approved Cable Manufacturers:
4. Wiring from the following manufacturers which meet the above criteria shall be acceptable:
5. Anixter
6. Belden

PART 3 – EXECUTION

3.1 EXAMINATION

- A. The project plans shall be thoroughly examined for control device and equipment locations. Any discrepancies, conflicts, or omissions shall be reported to the architect/engineer for resolution before rough-in work is started.
- B. The contractor shall inspect the site to verify that equipment may be installed as shown. Any discrepancies, conflicts, or omissions shall be reported to the engineer for resolution before rough-in work is started.
- C. The contractor shall examine the drawings and specifications for other parts of the work. If head room or space conditions appear inadequate—or if any discrepancies occur between the plans and the contractor's work and the plans and the work of others—the contractor shall report these discrepancies to the engineer and shall obtain written instructions for any changes necessary to accommodate the contractor's work with the work of others.

3.2 PROTECTION

- A. The contractor shall protect all work and material from damage by its employees and/or subcontractors and shall be liable for all damage thus caused.

- B. The contractor shall be responsible for its work and equipment until finally inspected, tested, and accepted.

3.3 COORDINATION

A. Site

1. The project coordination between trades is the responsibility of the prime contractor who is the one tier higher contractual partner such as mechanical contractor, general contractor, construction manager, owner or owner's representative as applicable.
2. The controls contractor shall follow prime contractor's job schedule and coordinate all project related activities through the prime contractor except otherwise agreed or in minor job site issues. Reasonable judgment shall be applied.
3. Where the work will be installed in close proximity to, or will interfere with, work of other trades, the contractor shall assist in working out space conditions to make a satisfactory adjustment.
4. If the contractor deviates from the job schedule and installs work without coordinating with other trades, so as to cause interference with work of other trades, the contractor shall make the necessary changes to correct the condition without extra charge.
5. Coordinate and schedule work with all other work in the same area, or with work that is dependent upon other work, to facilitate mutual progress.

B. Submittals.

1. Refer to the *Submittals* section in *PART 1-GENERAL* of this specification for requirements.
2. Test and Balance
3. The contractor shall furnish a single set of all tools necessary to interface to the control system for test and balance purposes.
4. The contractor shall provide training in the use of these tools. This training will be planned for a minimum of 4 hours.
5. In addition, the contractor shall provide a qualified technician for duration of 8 hours to assist in the test and balance process.
6. The tools used during the test and balance process shall be returned at the completion of the testing and balancing.

C. Life Safety

1. Duct smoke detectors required for air handler shutdown are supplied under Division 16 of this specification. The contractor shall interlock smoke detectors to air handlers for shutdown.
2. Coordination with controls specified in other sections or divisions.
3. Other sections and/or divisions of this specification include controls and control devices that are to be part of or interfaced to the control system specified in this section. These controls shall be integrated into the system and coordinated by the contractor as follows:
4. All communication media and equipment shall be provided as specified in the *Communication* section in *PART 2 – PRODUCTS* of this specification.
5. Each supplier of controls product is responsible for the configuration, programming, startup, and testing of that product to meet the sequences of operation described in this section.
6. The Contractor shall coordinate and resolve any incompatibility issues that arise between the control products provided under this section and those provided under other sections or divisions of this specification.

7. The contractor is responsible for providing all controls described in the contract documents regardless of where within the contract documents these controls are described.
8. The contractor is responsible for the interface of control products provided by multiple suppliers regardless of where this interface is described within the contract documents.

3.4 GENERAL WORKMANSHIP

- A. Install equipment, piping, and wiring/raceway parallel to building lines (i.e., horizontal, vertical, and parallel to walls) wherever possible.
- B. Provide sufficient slack and flexible connections to allow for vibration of piping and equipment.
- C. Install all equipment in readily accessible locations as defined by *Chapter 1, Article 100, Part A* of the *National Electrical Code (NEC)*.
- D. Verify integrity of all wiring to ensure continuity and freedom from shorts and grounds.
- E. All equipment, installation, and wiring shall comply with acceptable industry specifications and standards for performance, reliability, and compatibility and be executed in strict adherence to local codes and standard practices.

3.5 FIELD QUALITY CONTROL

- A. All work, materials, and equipment shall comply with the rules and regulations of applicable local, state, and federal codes and ordinances as identified in *PART 1 – GENERAL* of this specification.
- B. Contractor shall continually monitor the field installation for code compliance and quality of workmanship.
- C. Contractor shall have work inspected by local and/or state authorities having jurisdiction over the work.

3.6 EXISTING EQUIPMENT

- A. Unless otherwise directed, the contractor is not responsible for the repairs or replacement of existing energy equipment and systems, valves, dampers, or actuators. Should the contractor find existing equipment that requires maintenance, the engineer is to be notified immediately.

3.7 WIRING

- A. All control and interlock wiring shall comply with national and local electrical codes and Division 16 of this specification. Where the requirements of this section differ from those in Division 16, the requirements of this section shall take precedence.
- B. All NEC Class 1 (line voltage) wiring shall be UL Listed in approved conduit according to NEC and Division 16 requirements.
- C. All low-voltage wiring shall meet NEC Class 2 requirements. (Low-voltage power circuits shall be sub fused when required to meet Class 2 current limit.)
- D. Where NEC Class 2 (current-limited) wires are in concealed and accessible locations, including ceiling return air plenums, approved cables not in conduit may be used provided that cables are UL Listed for the intended application. For example, cables used in ceiling plenums shall be UL Listed specifically for that purpose.
- E. All wiring in mechanical, electrical, or service rooms—or where subject to mechanical damage—shall be installed in conduit.
- F. Do not install Class 2 wiring in conduit containing Class 1 wiring. Boxes and panels containing high voltage wiring and equipment may not be used for low-voltage wiring except for the purpose of interfacing the two (e.g., relays and transformers).
- G. Do not install wiring in conduit containing tubing.
- H. Where plenum rated cable is run exposed, wiring is to be run parallel along a surface or perpendicular to it and neatly tied at 3 m (10 ft) intervals.

- I. Where plenum rated cable is used without conduit, it shall be supported from or anchored to structural members. Cables shall not be supported by or anchored to ductwork, electrical conduits, piping, or ceiling suspension systems.
- J. All wire-to-device connections shall be made at a terminal block or wire nut. All wire-to-wire connections shall be at a terminal strip or wire nut.
- K. All wiring within enclosures shall be neatly bundled and anchored to permit access and prevent restriction to devices and terminals.
- L. Maximum allowable voltage for control wiring shall be 120V. If only higher voltages are available, the contractor shall provide step-down transformers or interposing relays.
- M. All plenum rated wiring shall be installed as continuous lengths, with no splices permitted between termination points
- N. All wiring in conduit shall be installed as continuous lengths, with no splices permitted between termination points or junction boxes.
- O. Maintain fire rating at all penetrations. Install plenum wiring in sleeves where it passes through walls and floors.
- P. Size and type of conduit and size and type of wire shall be the responsibility of the contractor, in keeping with the manufacturer's recommendations and NEC requirements, except as noted elsewhere.
- Q. Include one pull string in each conduit 3/4 in. or larger.
- R. Control and status relays are to be located in designated enclosures only. These enclosures can include packaged equipment control panel enclosures unless they also contain Class 1 starters.
- S. Conceal all conduit, except within mechanical, electrical, or service rooms. Install conduit to maintain a minimum clearance of 15 cm (6 in.) from high-temperature equipment (e.g., steam pipes or flues).
- T. Secure conduit with conduit clamps fastened to the structure and spaced according to code requirements. Conduit and pull boxes may not be hung on flexible duct strap or tie rods. Conduits may not be run on or attached to ductwork.
- U. Adhere to this specification's Division 16 requirements where conduit crosses building expansion joints.
- V. The Contractor shall terminate all control and/or interlock wiring and shall maintain updated (as-built) wiring diagrams with terminations identified at the job site.
- W. Flexible metal conduits and liquid-tight, flexible metal conduits shall not exceed 1 m (3 ft) in length and shall be supported at each end. Flexible metal conduit less than 1/2 inch electrical trade size shall not be used. In areas exposed to moisture, including chiller and boiler rooms, liquid-tight, flexible metal conduits shall be used.
- X. Conduit must be adequately supported, properly reamed at both ends, and left clean and free of obstructions. Conduit sections shall be joined with couplings (according to code). Terminations must be made with fittings at boxes, and ends not terminating in boxes shall have bushings installed.

3.8 COMMUNICATION WIRING

- A. The contractor shall adhere to the items listed in the *Wiring* section in *PART 3 – EXECUTION* of the specification.
- B. All cabling shall be installed in a neat and workmanlike manner. Follow manufacturer's installation recommendations for all communication cabling.
- C. Do not install communication wiring in raceway and enclosures containing Class 1 or other Class 2 wiring.

- D. Maximum pulling, tension, and bend radius for cable installation, as specified by the cable manufacturer, shall not be exceeded during installation.
- E. Contractor shall verify the integrity of the entire network following the cable installation. Use appropriate test measures for each particular cable
- F. When a cable enters or exits a building, a lightning arrestor must be installed between the lines and ground. The lightning arrestor shall be installed according to the manufacturer's instructions.
- G. All runs of communication wiring shall be unspliced length when that length is commercially available.
- H. All communication wiring shall be labeled to indicate origination and destination data.
- I. Grounding of coaxial cable shall be in accordance with NEC regulations article on *Communications Circuits, Cable, and Protector Grounding*.

3.9 FIBER OPTIC CABLE SYSTEM

- A. Maximum pulling tensions as specified by the cable manufacturer shall not be exceeded during installation. Post-installation residual cable tension shall be within cable manufacturer's specifications.
- B. All cabling and associated components shall be installed in accordance with manufacturers' instructions. Minimum cable and unjacketed fiber bend radii, as specified by cable manufacturer, shall be maintained.
- C. All terminations need to be made into a patch panel, designed for such use. Free air terminations with patch panels are prohibited.

3.10 INSTALLATION OF SENSORS

- A. Install sensors in accordance with the manufacturer's recommendations.
- B. Mount sensors rigidly and adequately for the environment within which the sensor operates.
- C. Room temperature sensors shall be installed on concealed junction boxes properly supported by the wall framing.
- D. All wires attached to sensors shall be air sealed in their raceways or in the wall to stop air transmitted from other areas affecting sensor readings.
- E. Sensors used in mixing plenums and hot and cold decks shall be of the averaging type.
- F. Low-limit sensors used in mixing plenums shall be installed in a serpentine manner horizontally across the full face of the coil.
- G. All pipe-mounted temperature sensors shall be installed in wells. Install all liquid temperature sensors with heat-conducting fluid in thermal wells.
- H. Install outdoor air temperature sensors on north wall, complete with sun shield at designated location.
- I. Room Instrument Mounting
- J. Room instruments, including but not limited to wall mounted thermostats and sensors located in occupied spaces shall be mounted 53 inches above the finished floor unless otherwise shown.
- K. Instrumentation Installed in Piping Systems
- L. Thermometers and temperature sensing elements installed in liquid systems shall be installed in thermowells.
- M. Gauges in piping systems subject to pulsation shall have snubbers.
- N. Gauges for steam service shall have pigtail fittings with isolation valve.
- O. Duct Smoke Detectors

- P. Duct smoke detectors will be provided by the Electrical Contractor in supply and return air ducts in accordance with Division 16.
- Q. Contractor shall connect the DDC System to the auxiliary contacts provided on the Smoke Detector as required for system safeties and to provide alarms to the DDC system.
- R. Averaging Temperature Sensing Elements
- S. Sensing elements shall be installed in a serpentine pattern.
- T. Averaging sensors shall be installed in a serpentine manner vertically across the duct. Each bend shall be supported with a capillary clip.

3.11 ACTUATORS

- A. Mount and link control damper actuators according to manufacturer's instructions.
- B. To compress seals when spring-return actuators are used on normally closed dampers, power actuator to approximately 5° open position, manually close the damper, and then tighten the linkage.
- C. Check operation of damper/actuator combination to confirm that actuator modulates damper smoothly throughout stroke to both open and closed positions.
- D. Provide all mounting hardware and linkages for actuator installation.
- E. Electric/Electronic
- F. Dampers: Actuators shall be direct-mounted on damper shaft or jackshaft unless shown as a linkage installation. For low-leakage dampers with seals, the actuator shall be mounted with a minimum 5° available for tightening the damper seals. Actuators shall be mounted following manufacturer's recommendations.

3.12 WARNING LABELS & IDENTIFICATION TAGS

- A. Permanent warning labels shall be affixed to all equipment that can be automatically started by the DDC system.
- B. Labels shall use white lettering (12-point type or larger) on a red background.
- C. Warning labels shall read as follows: **C A U T I O N This equipment is operating under automatic control and may start or stop at any time without warning. Switch disconnect to "Off" position before servicing.**
- D. Permanent warning labels shall be affixed to all motor starters and all control panels that are connected to multiple power sources utilizing separate disconnects.
- E. Labels shall use white lettering (12-point type or larger) on a red background.
- F. Warning labels shall read as follows: **C A U T I O N This equipment is fed from more than one power source with separate disconnects. Disconnect all power sources before servicing.**
- G. Equipment and Device labeling:
- H. Labels and tags shall be keyed to the unique identifiers shown on the As-Built drawings.
- I. All Enclosures and DDC Hardware shall be labeled.
- J. All sensors and actuators not in occupied areas shall be tagged.
- K. Airflow measurement arrays shall be tagged to show flow rate range for signal output range, duct size, and pitot tube AFMS flow coefficient.
- L. Duct static pressure taps shall be tagged at the location of the pressure tap.
- M. Tags shall be plastic or metal and shall be mechanically attached directly to each device or attached by a metal chain or wire.

- N. Labels exterior to protective enclosures shall be engraved plastic and mechanically attached to the enclosure or DDC Hardware.
- O. Labels inside protective enclosures may be attached using adhesive, but shall not be hand written.
- P. Identify all other control components with permanent labels. All plug-in components shall be labeled such that removal of the component does not remove the label.
- Q. Identify room sensors relating to blower coils or valves with nameplates.
- R. Manufacturers' nameplates and UL or CSA labels are to be visible and legible after equipment is installed.
- S. Identification of Tubing and Wiring
- T. All wiring and cabling including that within factory-fabricated panels shall be labeled at each end within 5 cm (2 in.) of termination with the DDC address or termination number.
- U. Permanently label or code each point of field terminal strips to show the instrument or item served.
- V. All pneumatic tubing shall be labeled at each end within 5 cm (2 in.) of termination with a descriptive identifier.

3.13 IDENTIFICATION OF HARDWARE & WIRING

- A. All wiring and cabling, including that within factory-fabricated panels shall be labeled at each end within 5 cm (2 in.) of termination with the DDC address or termination number.
- B. All pneumatic tubing shall be labeled at each end within 5 cm (2 in.) of termination with a descriptive identifier.
- C. Permanently label or code each point of field terminal strips to show the instrument or item served.
- D. Identify control panels with minimum 1 cm (1/2 in.) letters on laminated plastic nameplates.
- E. Identify all other control components with permanent labels. All plug-in components shall be labeled such that removal of the component does not remove the label.
- F. Identify room sensors relating to blower coils or valves with nameplates.
- G. Manufacturers' nameplates and UL or CSA labels are to be visible and legible after equipment is installed.
- H. Identifiers shall match record documents.

3.14 PROGRAMMING

- A. Provide sufficient internal memory for the specified sequences of operation and trend logging. There shall be a minimum of 25% of available memory free within the primary controller for future use.
- B. Point Naming: System point names shall be modular in design, allowing easy operator interface without the use of a written point index. Point Naming standard shall be agreed upon between owner and BAS contractor. Refer to the Submittals section in PART 1 – GENERAL of this specification.
- C. Software Programming
 - 1. Provide programming for the system and adhere to the sequences of operation provided. The contractor also shall provide all other system programming necessary for the operation of the system, but not specified in this document. Imbed into the control program sufficient comment statements to clearly describe each section of the program. The comment statements shall reflect the language used in the sequences of operation and be of different font and color in text editor. Use the appropriate technique based on one of the following programming types:

D. Text-based:

1. Must provide actions for all possible situations.
2. Must be modular and structured.
3. Must be commented.
4. Must provide line-by-line programming and compilation wizard to allow for ease of editing.

E. Graphic-based:

1. Must provide actions for all possible situations.
2. Must provide programming and compilation wizard to allow for ease of editing.
3. Must be documented.

F. Operator Interface

1. Standard graphics—Provide graphics for all mechanical systems and floor plans of the building. This includes each chilled water system, hot water system, chiller, boiler, air handler, and all terminal equipment. Point information on the graphic displays shall dynamically update. Show on each graphic all input and output points for the system. Also show relevant calculated points such as setpoints.
2. Show terminal equipment information on a “graphic” summary table. Provide dynamic information for each point shown.
3. The contractor shall provide all the labor necessary to install, initialize, start up, and troubleshoot all operator interface software and its functions as described in this section. This includes any operating system software, the operator interface database, and any third-party software installation and integration required for successful operation of the operator interface.
4. Contractor shall provide necessary programming to create all reports referred to in the *Operator Interface Software* section in *PART 2–PRODUCTS* of this specification.

3.15 CONTROL SYSTEM CHECKOUT & TESTING

- A. Perform a three-phase commissioning procedure consisting of field I/O calibration and commissioning, system commissioning and integrated system program commissioning. Document all commissioning information on commissioning data sheets that shall be submitted prior to acceptance testing. Commissioning work that requires shutdown of system or deviation from normal function shall be performed when the operation of the system is not required. The commissioning must be coordinated with the owner and construction manager to ensure systems are available when needed. Notify the operating personal in writing of the testing schedule so that authorized personnel from the owner and construction manager are present throughout the commissioning procedure.

1. Phase I – Field I/O Calibration and Commissioning

- a. Verify that each control panel has been installed according to plans, specifications and approved shop drawings. Calibrate, test, and have signed off each control sensor and device. Commissioning to include, but not be limited to:
 - Sensor accuracy at 10, 50 and 90% of range.
 - Sensor range.
 - Verify analog limit and binary alarm reporting.
 - Point value reporting.
 - Binary alarm and switch settings.

- Actuator and positioner spring ranges if pneumatic actuation is utilized.
 - Fail safe operation on loss of control signal, pneumatic air, electric power, network communications, etc.
2. Phase II – System Commissioning
 - a. Each BMS program shall be put on line and commissioned. The contractor shall, in the presence of the owner and construction manager, demonstrate each programmed sequence of operation and compare the results in writing. In addition, each control loop shall be tested to verify proper response and stable control, within specified accuracy. System program test results shall be recorded on commissioning data sheets and submitted for record. Any discrepancies between the specification and the actual performance will be immediately rectified and re-tested.
 3. Phase III - Integrated System Program Commissioning
 - a. Tests shall include, but not be limited to:
 - b. Data communication, both normal and failure modes.
 - c. Fully loaded system response time.
 - d. Impact of component failures on system performance and system operation.
 - e. Time/Date changes.
 - f. End of month/end of year operation.
 - g. Season changeover.
 - h. Global application programs and point sharing.
 - i. System backup and reloading.
 - j. System status displays.
 - k. Diagnostic functions.
 - l. Power failure routines.
 - m. Battery backup.
 - n. Smoke Control, vents, in concert with Fire Alarm System testing.
 - o. Testing of all electrical and HVAC systems with other division of work.
 - p. Year 2000 compliance test.
- B. Sub Systems shall also be tested and commissioned.
 - C. Submit for approval, a detailed acceptance test procedure designed to demonstrate compliance with contractual requirements. This Acceptance test procedure will take place after the commissioning procedure but before final acceptance, to verify that sensors and control devices maintain specified accuracy and the system performance does not degrade over time.
 - D. Using the commissioning test data sheets, the contractor shall demonstrate each point. The contractor shall also demonstrate 100 percent of the system functions. The contractor shall demonstrate all points and system functions until all devices and functions meet specification.
 - E. The B.M.S. contractor shall supply all instruments for testing. Instruments shall be turned over to the owner after acceptance testing.
 - F. All test instruments shall be submitted for approval prior to their use in commissioning.
 1. Test Instrument Accuracy:
 2. Temperature: 1/4°F or 1/2% full scale, whichever is less.
 3. Pressure: High Pressure (psi): 1/2 psi or 1/2% full scale, whichever is less.

4. Low Pressure: 1/2% of full scale (in. w.c.)
 5. Humidity: 2% rh
 6. Electrical: 1/4% full scale
- G. After the above tests are complete and the system is demonstrated to be functioning as specified, a thirty-day performance test period shall begin. If the system performs as specified throughout the test period, requiring only routine maintenance, the system shall be accepted. If the system fails during the test, and cannot be fully corrected within eight hours, the owner may request that performance tests be repeated.
- H. Additional testing, debugging and fine tuning
- I. Provide an additional 100 hours of appropriate highest labor cost category to be used at the owner's discretion to test, debug and fine tune the system during standard business hours.

3.16 CONTROL SYSTEM DEMONSTRATION & ACCEPTANCE

A. Demonstration

1. Prior to acceptance, the control system shall undergo a series of performance tests to verify operation and compliance with this specification. These tests shall occur after the Contractor has completed the installation, started up the system, and performed his/her own tests.
2. The tests described in this section are to be performed in addition to the tests that the contractor performs as a necessary of the installation, start-up, and debugging process and as specified in the *Control System Checkout and Testing* section in *PART 3–EXECUTION* of this specification. The engineer will be present to observe and review these tests. The engineer shall be notified at least 10 days in advance of the start of the testing procedures.
3. The demonstration process shall follow that approved in the *Submittals* section in *PART 1–GENERAL* of this specification. The approved checklists and forms shall be completed for all systems as part of the demonstration.
4. The contractor shall provide at least two persons equipped with two-way communication and shall demonstrate actual field operation of each control and sensing point for all modes of operation including day, night, occupied, unoccupied, fire/smoke alarm, seasonal changeover, and power failure modes. The purpose is to demonstrate the calibration, response, and action of every point and system. Any test equipment required to prove the proper operation shall be provided by and operated by the contractor.
5. As each control input and output is checked, a log shall be completed showing the date, technician's initials, and any corrective action taken or needed.
6. Demonstrate compliance with the *System Performance* section in *PART 1–GENERAL* of this specification.
7. Demonstrate compliance with sequences of operation through all modes of operation.
8. Demonstrate complete operation of operator interface.
9. Any tests that fail to demonstrate the operation of the system shall be repeated at a later date. The contractor shall be responsible for any necessary repairs or revisions to the hardware or software to successfully complete all tests.

B. Acceptance

1. All tests described in this specification shall have been performed to the satisfaction of both the engineer and owner prior to the acceptance of the control system as meeting the requirements of completion. Any tests that cannot be performed due to circumstances beyond the control of the contractor may be exempt from the completion requirements if stated as such in writing by the engineer. Such tests shall then be performed as part of the warranty.

2. The system shall not be accepted until all forms and checklists completed as part of the demonstration are submitted and approved as required in the *Submittals* section in *PART 1-GENERAL* of this specification.

3.17 CLEANING

- A. The contractor shall clean up all debris resulting from their activities daily. Contractor shall remove all cartons, containers, crates, etc., under their control as soon as their contents have been removed. Waste shall be collected and placed in a designated location.
- B. At the completion of work in any area, the contractor shall clean all work, equipment, etc., keeping it free from dust, dirt, and debris, etc.
- C. At the completion of work, all equipment furnished under this section shall be checked for paint damage, and any factory-finished paint that has been damaged shall be repaired to match the adjacent areas. Any cabinet or enclosure that has been deformed shall be replaced with new material and repainted to match the adjacent areas.

3.18 TRAINING

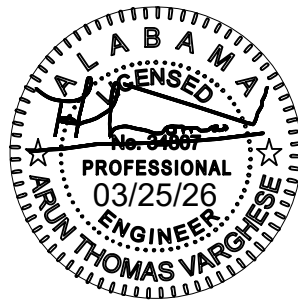
- A. The Contractor shall provide competent instructors to give full instruction to designated personnel in the adjustment, operation and maintenance of the system installed. Factory employed/certified instructors shall be thoroughly familiar with all aspects of the subject matter they are to teach. All training shall be held during normal work hours of 8:00 a.m. to 4:30 p.m. weekdays.

3.19 SEQUENCE OF OPERATION

- A. Refer to Sequence on plans.

END OF SECTION.

ELECTRICAL SPECIFICATIONS 16000



SECTION 16100 – ELECTRICAL

PART 1 - GENERAL

1.1 GENERAL

- A. The General and/or Special Conditions Sections are a part of this specification and the Contractor shall consult them in detail for instructions pertaining to this work. Section 16 is sub-divided for convenience only.

1.2 SCOPE

- A. Furnishing of all labor, material, equipment, supplies, and services necessary to construct and install the complete electrical systems as shown on the drawings and specified herein. Work shall include but is not necessarily limited to the following items:
 - 1. Service Entrance
 - 2. Grounding
 - 3. Lighting and controls
 - 4. Demolition
 - 5. Telecommunications
 - 6. Exterior Distribution/Branch Circuits
 - 7. Interior Distribution/Branch Circuits
 - 8. Equipment Connections
 - 9. Fire alarm
 - 10. Intercom/Sound
 - 11. Outdoor Lighting

1.3 JOB CONDITIONS

- A. Site Inspections: Before submitting proposals, each bidder should visit the site and fully familiarize himself with all job conditions and shall be fully informed as to the extent of his work. No consideration will be given after bid opening date for alleged misunderstanding as to the requirements of work involved in connecting to the utilities, as to requirements of materials to be furnished, or as to the extent of demolition required.
- B. Existing Conditions: All utilities, existing systems, and conditions shown on the plans as existing are approximate, and the Contractor shall verify all details of the project before any work is started.
- C. Scheduled Interruptions: Planned interruptions of utilities service, to any facility affected by this contract, shall be carefully coordinated and approved by the Architect at least ten (10) days in advance of the requested interruption. The Contractor shall not interrupt services until specific approval has been granted by the Architect. The request shall indicate services to be affected, date and time of interruption and duration of outage. Request for interruption of service will not be approved until all equipment and material required for the completion of that particular phase of work are on the job site. The work may have to be scheduled after normal working hours.
- D. Maintaining Service: Any existing service (or operating system) which must be interrupted for any length of time shall be supplied with a temporary service as necessary for continuation of the normal operation of this facility.
- E. Removal of Existing Work: Where noted or indicated on the drawings, or specified herein, existing electrical materials and equipment shall be removed from the building. All materials designated to be removed by the Contractor, not to be salvaged and given to the Owner or required to be reinstalled, including scrap, shall become the property of the Contractor, and shall be promptly removed from the site. Existing items required to be removed temporarily in order to

properly install new work shall be replaced in a satisfactory manner upon completion.

1.4 TEMPORARY POWER

- A. Furnish and maintain temporary wiring system for light and power for use during construction by all trades. Use solidly grounded system. Limit over-current protection to 20 amperes on No. 12 conductors. Coordinate all requirements for temporary power with the serving utility and pay for all charges incurred while furnishing power for construction. Verify whether charges for electrical power consumption are specified in Division One; if so, payment of bills for power consumption are not included under this section.
- B. Accidental Interruptions: All excavation and/or remodeling work required shall be performed with care so as not to interrupt other existing services (water, gas, electrical, sewer, sprinklers, etc.). If accidental utility interruption resulting from work performed by the Contractor occurs, service shall be immediately restored to its original condition without delay, by and at the expense of the Contractor, using skilled workmen of the trade required.

1.5 CODES, PERMITS AND INSPECTIONS

- A. The installation shall comply with all local, state, and federal laws and ordinances applicable to electrical installation and with the regulations of the latest published edition of the National Electrical Code (N.E.C.) where such regulations do not conflict with those laws and ordinances. The Contractor shall obtain and pay for all permits and inspection fees, and after completion of the work, shall furnish the Architect a certificate of final inspection and approval from the applicable local inspection authorities. Any charges by a utility (Power, Telephone, Cable TV, etc.) for providing service as shown shall be included in the bid and paid by the Contractor. The installation shall comply with:
 - 1. International Building Code 2021
 - 2. International Fire Code 2021
 - 3. NFPA 70-2020, National Electrical Code
 - 4. NFPA 72-2019, National Fire Alarm and Signaling Code

1.6 DRAWINGS AND SPECIFICATIONS

- A. The drawings and these specifications are complimentary each to the other. What is called for by one shall be as binding as if called for by both. Where the drawings and/or specifications differ as to quantity or quality, the greater quantity or higher quality shall be provided. Omissions from the drawings and specifications of details of work which are evidently necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such work. In any case of discrepancy in the figures or catalog numbers, the matter shall be submitted to the Architect, who shall promptly make a determination in writing. Any adjustment by the Contractor shall be at the Contractor's own risk and expense. Electrical drawings are diagrammatic only. Do not scale these drawings. All equipment shall be installed in accordance with manufacturer's recommendations and any conflicting data shall be verified before bidding.

1.7 STANDARDS OF MATERIALS AND WORKMANSHIP

- A. Materials: All materials shall be new and shall be listed and approved by the Underwriters' Laboratories, Inc., in every case where a standard has been established for a particular type of material in question. All work shall be executed in a workmanlike manner and shall present a neat appearance.
- B. Prior Approvals: Equipment and materials of the same type or classification and used for the same purpose, shall be products of the same manufacturer. It is the intention of these specifications to indicate a standard of performance and quality for all materials incorporated in this work. Manufacturer's names and catalog numbers are used to designate the item of equipment or material as a means of establishing grade and quality. Where several manufacturers are named, only those named manufacturers' products will be considered and the Contractor's bid shall be on their products. The first named of several manufacturers is the

manufacturer whose product was used in engineering the project. Other named manufacturers, although acceptable as manufacturers, shall guarantee that their product will perform as specified and will meet space requirements. Where performance characteristics of such equipment differs from the equipment scheduled on the drawings, the engineer shall reserve the right to reject it. Where use of such equipment requires different quantity or arrangement of foundations, supports, ductwork, piping, wiring, conduit and any other equipment. The Contractor shall furnish said changes and additions and pay all costs for all changes to the work and the work of others affected by using such equipment.

- C. For approval of products other than those specified, bidders shall submit to the Architect, a request in writing, at least ten (10) days prior to bid date. Requests received after this time will not be reviewed or considered regardless of cause. Requests shall clearly define and describe the product for which approval is requested. Requests shall be accompanied by manufacturer's literature, specifications, drawings, cuts, performance data, model numbers, list of references or other information necessary to completely describe the item. Approval will be in the form of an Addendum to the specifications issued to all prospective Prime Contract Bidders on record. The Addendum will indicate the additional products which are approved for this project.
- D. If a bidder proposes to use substitute materials or equipment for the following items, he shall obtain a minimum of ten (10) days before Bid "Prior Approval" or longer as described in "Instructions to Bidders" for the items indicated below:
 - 1. Low Voltage Switchboards
 - 2. Lighting controls.
 - 3. Dry type transformers.
 - 4. Panelboards.
 - 5. Safety switches.
 - 6. Lighting fixtures.
 - 7. Emergency battery units.
 - 8. Fire alarm system.
 - 9. Intercom/Clock
- E. Approval on other items shall be handled in the normal manner, as described in "Instructions to Bidders", under the heading "Approval of Materials", preferably before receipt of bids.
- F. Substitutions: Reference to a particular product by manufacturer, trade name, or catalog number establishes the quality standards of material and equipment required for this installation and is not intended to exclude products equal in quality and similar design. The Architect reserves the sole right to decide the equality of materials proposed for use in lieu of these specified. It shall be the Contractor's responsibility to furnish the information and data sufficient to establish the quality and utility of the items in question, including furnishing samples if required.
- G. Shop Drawings: The Contractor shall submit a list of items proposed for use. He shall also submit catalog data and shop drawings on proposed systems and their components, panelboards, safety switches, starters and contactors, transformers, lighting fixtures, and wiring devices. Where substitutions alter the design or space requirements, the Contractor shall defray all items of cost for the revised design and construction including costs to all allied trades involved. Data shall be submitted within ten (10) calendar days after the contract is awarded. Provide six (6) copies of shop drawings unless a greater number of copies is required by the General Conditions. Each submittal data section shall be covered with an index sheet listing Contractor, Sub-Contractor, Project Name, and an index to the enclosed submittals.
- H. Each major section of submittals such as power, equipment, lighting equipment, fire alarm, etc., shall be secured in a booklet or stapled with a covering index which lists the following information:
 - 1. General contractor with phone number and project manager.
 - 2. Subcontractor with phone number and project manager.

3. Supplier of equipment with phone number and person responsible for this project.
4. Index of each item covered in submittal and model number as proposed in the attached.
5. Any deviation from contract documents shall be specifically noted on submittal cover index and boldly on specific submittal sheet.

1.8 TYPE OF PERMANENT ELECTRICAL SERVICE

- A. The new electrical service is 480 volts, 3-phase, 4 -wire. Contractor shall verify all details of electrical service with the serving utility company prior to bid.
- B. Operating and Maintenance Manuals: At completion of the work, furnish three (3) copies of written operation instructions which shall include manufacturer's descriptive bulletins, operating and maintenance manuals and parts lists of all equipment installed. Also include in such instructions, the specified size and capacity ratings of all equipment installed. Each set of instructions shall be assembled into a suitable loose-leaf type binder and presented to the Architect for delivery to the Owner.
- C. Record Drawings: Maintain one extra set of black-line, white print drawings for use as Record drawings. Records shall be kept daily, using colored pencil. As the work is completed, relevant information shall be transferred to a reproducible set, and copies made to be given to the Architect.
- D. Comply with the following for all work specified in Division Sixteen. As-built information shall be shown to scale, using standard symbols listed in the legend. As a minimum, show the following:
 1. Location of stub-outs, dimensioned from permanent building lines.
 2. Location and depth of under-slab and in-slab raceways.
 3. All routing of raceways.
 4. Corrected panelboard and equipment schedules.
 5. Corrected circuit numbers as they appear on panelboard directories.
 6. Corrected motor horsepower and full load amperages.
 7. Number, size, type of insulation, and number of wires in each conduit or multi-conductor cable whether in conduit or exposed.
 8. Location of junction boxes and splices.
 9. Location of access panels.

1.9 INTERFACE WITH OTHER CONTRACTS

- A. It shall be the responsibility of the Contractor to cooperate with all other crafts working on this project. All cutting, trenching, backfill, and structural removals to permit entry of the electrical system components shall be done by this Contractor. All patching and finishing shall be done by the General Contractor.
- B. It shall be the responsibility of the Electrical Contractor to coordinate, provide, and install the overcurrent protection devices, wire, and conduit as required for the specific mechanical equipment installed.
- C. It shall be the responsibility of the Contractor to cooperate with all other crafts working on this project to ensure there are not pipes, ductwork or other foreign systems as described in the latest version of the NEC within the working space or the dedicated space for the electrical equipment. All piping, ductwork or other foreign systems as described in the latest version of the NEC located above the dedicated space shall have shields or other protection as approved by the NEC.

1.10 EQUIPMENT FURNISHED UNDER OTHER SECTIONS

- A. This Contractor shall furnish and install complete electrical roughing-in and connection to all equipment furnished under other sections as indicated on drawings. All such equipment shall be set in place as work of other sections.

- B. The Electrical Contractor is to provide and install all components, wire, conduit, boxes, etc. to interlock the exhaust fans with the HVAC equipment as required.
- C. The Electrical Contractor is to provide and install the required device boxes for the HVAC controls. A raceway, 3/4" conduit minimum, is to be provided and installed from the device location to the accessible space above the ceiling or as appropriate for the application. Line voltage thermostats are to be installed by the Electrical Contractor. Exact requirements for control wiring, conduit, boxes, etc. shall be coordinated with the mechanical contractor and mechanical documents prior to bid.

1.11 EQUIPMENT CONNECTIONS

- A. In general, provide electrical power and control systems connections to all equipment shown on drawings. Included are wiring raceways, disconnects, starters, and other devices shown. Excluded are devices furnished integrally with the manufacturer's package and work specified in other sections of these specifications.

1.12 GROUNDING

- A. Provide grounding and bonding systems in strict accordance with the latest published edition of N.E.C., except where more stringent requirements are specified herein. Inter-connection of neutral and ground is not permitted except at service entrance equipment or as required for a separately derived system. Install grounding conductors to permit shortest and most direct path to ground. Inaccessible joints are not to be made in grounding conductors. Where grounding conductors are in raceway, bond conductor and raceway at both ends. Grounding and bonding fittings used shall be UL listed and be compatible with metals used in system. Sheet metal type straps are not acceptable.
- B. Service entrance ground shall consist of driven electrodes, ground ring, building steel, water pipe electrodes, concrete encased electrode, rod and pipe electrodes, or plate electrodes as available. The driven electrodes, building steel, water pipe electrodes, and concrete encased electrodes are the minimum requirements. Unless otherwise shown on drawings, each driven electrode shall consist of one 3/4 inch diameter 10 ft. long copperweld steel rod. Rod made of wrought iron may be used in lieu of copperweld at option of contractor. Water pipe connection shall be made to a minimum one inch diameter metallic cold water pipe. Extend grounding conductor to main telephone equipment space. Interconnect conduits entering and leaving service entrance equipment using grounding bushing and copper conductor.
- C. A green insulated ground conductor shall be run in all branch circuit and feeder conduit with phase and/or neutral conductors. Ground conductor shall be sized per NEC or as noted on drawings. Minimum size #12 AWG. Conduit box to device strap or yoke screw connection is not sufficient. Provide an insulated grounding jumper for receptacle circuits.
- D. The Electrical Contractor shall test and provide written certification of final ground system; including test method, equipment model and serial numbers, and final measurements at each point. The ground electrode system must be less than 25 ohms.

1.13 GUARANTEE AND SERVICE

- A. Upon completion of all tests and acceptance, the Contractor shall furnish the Owner of a written guarantee covering the electrical work done for a period of one (1) year from date of acceptance. Guarantee includes equipment capacity and performance ratings specified without excessive noise levels. Upon notice from the Architect or the Owner, the Contractor shall, during the guarantee period, rectify and replace any defective material or workmanship and repair any damage caused thereby without additional cost.

PART 2 – PRODUCTS

2.1 GENERAL

- A. All equipment and materials shall have ratings established by the recognized independent agency or laboratory. The Contractor shall apply the items used on the project within the ratings and

subject to any stipulations or exceptions established by the independent agency or laboratory. Use of equipment or materials in applications beyond that certified by the agency or beyond that recommended by the manufacturer shall be cause for removal and replacement of such misapplied items.

2.2 LOW VOLTAGE SWITCHBOARD

- A. General - The Contractor shall furnish and install, where indicated, a free-standing, dead-front type low-voltage distribution switchboard, utilizing group mounted circuit protective devices as specified herein, and as shown on the contract drawings. The low-voltage distribution switchboards and all components shall be designed, manufactured and tested in accordance with the latest applicable following standards:

1. NEMA PB-2
2. UL Standard 891.

The manufacturer of the assembly shall be the manufacturer of the circuit protective devices within the assembly. The low-voltage switchboard shall be UL labeled.

- B. Ratings: The assembly shall be rated to withstand mechanical forces exerted during short-circuit conditions when connected directly to a power source having available fault current as shown on the drawings. Voltage rating to be as indicated on the drawings.

C. Construction

1. Switchboard shall consist of the required number of vertical sections bolted together to form a rigid assembly. The sides and rear shall be covered with removable bolt-on covers. All edges of front covers or hinged front panels shall be formed. Provide adequate ventilation within the enclosure.
2. All sections of the switchboard shall be rear aligned with depth as shown on the drawings. All protective devices shall be group mounted. Devices shall be front removable and load connections front accessible enabling switchboard to be mounted against a wall.
3. The assembly shall be provided with adequate lifting means.
4. The switchboard shall be equal to Cutler-Hammer type Westinghouse Pow-R-Line C utilizing the components herein specified and as shown on the drawings.
5. The switchboard shall be suitable for use as service entrance equipment and be labeled in accordance with UL requirements.
6. The switchboard shall be capable of metering requirements as indicated on the drawings.

D. Bus

1. All bus bars shall be silver-plated copper. Bus sizing shall be based on NEMA standard temperature rise criteria of 65°C over a 40°C ambient (outside the enclosure).
2. Provide a full capacity neutral bus.
3. A copper ground bus (minimum 1/4 x 2 inch) shall be furnished firmly secured to each vertical section structure and shall extend the entire length of the switchboard.
4. All hardware used on conductors shall be high-tensile strength and zinc-plated. All bus joints shall be provided with conical spring-type washers.

E. Wiring/Terminations

1. Small wiring, necessary fuse blocks and terminal blocks within the switchboard shall be furnished as required. Control components mounted within the assembly, such as fuse blocks, relays, pushbuttons, switches, etc., shall be suitably marked for identification corresponding to appropriate designations on manufacturer's wiring diagrams.
2. Mechanical-type terminals shall be provided for all line and load terminations suitable for copper cable rated for 75 degrees C of the size as indicated on the drawings.

3. Lugs shall be provided in the incoming line section for connection of the main grounding conductor. Additional lugs for connection of other grounding conductors shall be provided as indicated on the drawings.
- F. Circuit Breakers: Where indicated, provide circuit breakers UL listed for application at 100% of their continuous ampere rating in their intended enclosure.
- G. Nameplates
 1. Engraved nameplates, mounted on the face of the assembly, shall be furnished for all main and feeder circuits as indicated on the drawings. Nameplates shall be laminated plastic, black characters on white background. Characters shall be 3/16-inch high, minimum. Nameplates shall give item designation and circuit number as well as frame ampere size and appropriate trip rating. Furnish master nameplate giving switchboard designation, voltage ampere rating, short-circuit rating, manufacturer's name, general order number, and item number.
 2. Control components mounted within the assembly, such as fuse blocks, relays, pushbuttons, switches, etc., shall be suitably marked for identification corresponding to appropriate designations on manufacturer's wiring diagrams.
- H. Finish: All exterior and interior steel surfaces of the switchboard shall be properly cleaned and provided with a rust-inhibiting phosphatized coating. Color and finish of the switchboard shall be ANSI 61 light gray.

2.3 PANELBOARDS

- A. General: Furnish and install circuit breaker lighting and appliance panelboards where shown on the drawings and as indicated in the panelboards schedule. Panelboards shall comply with the following industry standard:
 1. NEMA Standard PB-1
 2. UL Standards: Cabinets and Boxes -UL50; Panelboards - UL 67
 3. National Electric Code
 4. Panelboards shall be labeled as suitable for use as service equipment in accordance with Article 408 of the National Electrical Code.
- B. Box: The panel box shall not be less than 20 inches wide and fabricated from galvanized or galvanized steel. Box shall have adjustment screws to provide easy alignment for flush mounted applications. Removable end walls to be blank with no KO's. Panelboard box is to have separate UL label and minimum wire bending and gutter requirements to meet the NEC and UL standards. Wiring gutters shall be completely free of any part of trim clamp to prevent damaging wire insulation.
- C. Interior Type S3: All interiors shall be completely factory assembled. The design of the interior should permit replacement of circuit breakers without disturbing adjacent units and without machine drilling or tapping. Bus bars and breaker branch bus shall be of 98% conductivity copper. Bus sequence shall start at the top left phase bus of the interior for both top and bottom fed panels. Panelboard bus structure and main breaker or main lugs shall have current ratings as shown on the plans or as indicated in panel schedule. Such ratings shall be established by heat rise test in accordance with Standard UL 67. Bus bars shall be supported by glass filled polyester type insulators. All bolts used to connect current carrying parts together shall be case hardened, thread-forming type and be accessible for tightening from the front of the panel. Provide an individual circuit number button with an embossed number next to each breaker or provision. Stick on numbers are unacceptable.
- D. Dead front to be provided with flange for easy attachment of trim. Incoming cable lugs shall be grouped at one end to separate them from the load side cables. Neutral bussing shall have a lug for each outgoing branch requiring a neutral connection. For easy wiring and shortest cable run possible, load side neutral connection lugs to be split with each side taking 50% of load neutral connections. The interior shall be provided with wing nuts for securing to box without tools.
- E. All computer isolation panels shall have 200% neutral bus.

- F. Fas-Latch Trim: The panel trim shall be surface or flush as indicated on the drawings. It shall be fabricated from cold rolled steel, painted with an ANSI-61 light gray finish and equipped with concealed hinges, flush lock and a holder for circuit directory card. Trim shall have two separate supports designed to engage the box flange to stabilize and secure the trim during installation. Trim screws to be located behind the lockable door for tamper resistance. No external screws on trims will be allowed. Trims shall be hinged to box.
- G. Description: The panelboards shall be Sentron type for use on systems as indicated on each panelboard schedule. The panelboard enclosures shall be NEMA Type 1 construction for top or bottom cable entrance and suitable for surface or flush mounting unless otherwise noted on panelboard schedules. Panels shall be interchanged from top or bottom feeds.
- H. Short circuit rating shall be as indicated on panel schedule.
- I. Provide main lug only or main circuit breaker panel boards as shown on panelboard schedules. Also provide branch and subfeed circuit breakers of the quantity, trip rating and number of poles as shown on schedules. All panels shall accept additional feed thru lugs or subfeed breaker without modification to bus.
- J. Molded case circuit breakers shall be thermal magnetic, quick make, quick break, trip free. Multi-pole breakers shall be common trip. All breakers shall be equipped with antiturn solderless, pressure type connectors. All provisions shall be located at the bottom of the panelboard and be fully bussed complete with all necessary mounting hardware less the breaker. No plug in breakers will be allowed.
- K. All panels shall be fully rated. No series rating of breakers is acceptable.
- L. Provide subfeed lugs, feed through lugs, handle blocking devices, pad locking devices, shunt trips and ground bus bars as shown on schedules.
- M. Panelboards shall be manufactured by Siemens, General Electric or Square D or prior approved.

2.4 NAMEPLATES

- A. Each new panel shall have an external micarta engraved nameplate. Disconnect switches, starters or similar devices shall have a micarta engraved nameplate mechanically affixed (no glue) indicating the load served and the location, such as "A/C 2" or "A/C 3 above ceiling". Letters shall be 1/4" black on a white background. Panels shall be designated in this manner.

"Panel A
120/208 Volts
3 Phase, 4 Wire"

2.5 DIRECTORIES

- A. For panelboards, install typewritten directories, listing each branch circuit, identifying space and equipment it controls. Label panels, disconnect switches, pushbuttons, motor starters, and time clocks with identification shown on plans using engraved nameplates, identify main and switches ahead of mains, noting equipment they serve.

2.6 DISCONNECT SWITCHES

- A. Furnish heavy duty disconnect switches. Switches shall be a product of the same manufacturer as panelboards, using a quick-make, quick-break mechanism. Enclosure shall be Nema type conforming to area in which it is installed. Shop drawings include manufacturer's catalog data and physical dimensions for each size switch.

2.7 FUSES

- A. Furnish fuses for fusible equipment. Supply one (1) set of 3-spares fuses for each size used. Provide spare fuse cabinet. Fuses specified are coordinated and shall be manufactured by Bussman. Chase-Shawmut and Little Fuse will be approved provided shop drawing submittal demonstrates selective coordination.

2.8 RACEWAY AND FITTINGS

- A. Rigid Metal Conduit - Shall have threaded fittings, galvanized steel or threadless compression galvanized steel or threadless compression cadmium plated malleable iron. Fittings shall be rain tight/concrete tight.
- B. Electrical Metallic Tubing (EMT) - Material of steel or malleable iron is acceptable. Couplings and connectors shall be concrete and rain tight, with connectors having insulated throats. Use gland and ring compression type couplings and connectors for conduit sizes 2" and smaller. Use set screw type couplings with four set screws each for conduit sizes over 2". Use set screws of casehardened steel with hex head and cup point to firmly seat in wall of conduit for positive grounding. Indent type connectors or couplings are prohibited. Die-cast or pressure-cast zinc-alloy fittings or fittings made of "pot metal" are prohibited.
- C. Rigid Non-Metallic Conduit - shall have polyvinyl chloride (PVC) fittings suited for the purpose and joined together by a method approved for the purpose. Schedule 80 conduit sections may be joined together with threaded fitting connectors.
- D. Flexible Metal Conduit - fittings shall be zinc plated steel or cadmium plated malleable iron screw type with insulated throat and angular wedge fitting between convolutions of conduit.
- E. Liquidtight Flexible Metal Conduit - fittings shall be cadmium plated, malleable iron or steel with compression type steel ferrule and neoprene gasket sealing rings, with insulated throat.
- F. Conduits installed concealed in earth fill, concrete or, solid masonry structures shall be PVC 40. PVC shall not be installed in any exposed locations. All exposed exterior conduits shall be GRS. Any GRS installed below grade or in concrete shall have bitumastic applied prior to installation.
- G. Conduits used for connection to recessed lighting fixtures shall be FLEX. Conduits for connection to motors or vibrating equipment shall be LQFLEX not less than 18" long and not over 60" long. All flexible conduits are to be secured at a minimum of every three feet using approved methods.
- H. Conduits run concealed in the hollow space of non-masonry walls or, above suspended/hard ceilings shall be EMT. Exposed conduits shall be run at right angles to or parallel with building lines and exposed structure. In all cases, conduit runs shall be grouped together where possible and shall be supported from the building structure, not from any suspended ceiling support system.
- I. PVC 80 shall be used only as indicated on the drawings and shall be UL listed as sunlight resistant. Install conduits passing through building sidewalls or through beams below grade with expansion/deflection fittings. Install expansion fittings where conduit crosses an expansion joint. Where conduit penetrates damp-proofing membranes, cut the membrane carefully around the conduit and seal the joint with pressure sensitive tape.
- J. All conduit bends are to be made with a device made for the application. All conduit runs are to be parallel or perpendicular to the building structure. Conduit offsets are to be utilized at junction boxes and device boxes and a strap placed on conduit at the point nearest the box for support.
- K. Support raceways securely with pipe straps, wall brackets, conduit hangers or ceiling trapeze. Fastenings shall be by wood screws or screw type nails to wood, by toggle bolts to concrete block, expansion bolts on concrete or brick, and beam clamp types on steel or bar joists. Raceways shall not be fastened to suspended ceiling supports but must have independent support from the structure. Supporting devices shall be of materials having corrosion protection at least equal to the raceway. A support shall be provided as close as practical to, and not exceeding 18" from an unsupported box or from change of direction. In horizontal runs, this support may be omitted if the box is independently supported and the box connection is not made with chase nipple or threadless box connector. In vertical runs, load produced by weight of the raceway and conductors shall not be carried by the raceway terminal, but must be carried entirely by conduit supports. Install conduit supports in strict accordance with the following table, except as required by support for boxes and changes in direction:

MAXIMUM SUPPORT TRADE SIZE	LOCATION OF RUNS	SPACING
1/2, 3/4	Exposed, Horizontal	7 feet
1 and larger	Exposed, Horizontal	10 feet
All sizes	Concealed, Horizontal	10 feet
1/2, 3/4	Exposed, Vertical	7 feet
1, 1-1/4	Exposed, Vertical	8 feet
1-1/2 and larger	Exposed, Vertical	10 feet
All sizes	Concealed, Vertical	10 feet

- L. For conduit runs that are not sized on drawings, the maximum conduit fill shall be computed using the requirements for Type THW conductors although the actual wiring is with Type THWN or other type of conductors having smaller cross-sections. This requirement is made to provide spare conduit capacity.
- M. Install all required sleeves for conduits passing through concrete slabs. Fire proof space between conduit and sleeve after installation using of mineral wool as required. All fire wall penetrations are to be sealed with a U. L. approved method. Any penetrations of the roof membrane must be sealed by a certified roofing contractor using an approved method.
- N. Expansion Joints:
1. Conduits 3" and larger, that are secured to the building structure on opposite sides of a building expansion joint, required expansion and deflection couplings. Install couplings in accordance with the manufacturer's recommendations.
 2. Provide conduits smaller than 3" with junction boxes on both sides of the expansions joint. Connect conduits to junction boxes with sufficient slack of flexible conduit to produce 5" vertical drop midway between ends. Flexible conduit shall have a green copper ground-bonding jumper installed. In lieu of this flexible conduit, expansion and deflection couplings as specified above for three inches and larger conduits are acceptable.
 3. Expansion fittings shall be provided for raceways to compensate for thermal expansion and contraction in conduit runs 200ft or greater and at building expansion joints. Bonding jumpers shall be provided for electrical continuity of the raceway system at the expansion fittings.
- O. Conductors:
1. All conductors shall be installed in conduit. Conductors for building wiring shall have THHN/THWN, 600-volt insulation and shall be soft-drawn copper of standard American Wire Gauge (AWG) size. Minimum size shall be No. 12. 20-amp branch circuits more than 100 feet in length shall be upsized to No. 10. Provide individual neutral conductors for all single-pole branch circuits. Tied breaker handles are not acceptable. All wire No. 8 and larger shall be stranded. All branch circuits No. 10 and smaller shall be wired with color-coded wire with the same color used for a system throughout the building. Power feeders and branch circuits larger than No. 10 shall either be fully color coded or shall have black insulation and be similarly color coded with tape or paint in all junction boxes and panels. Where tape or paint is used to identify conductors, apply at all terminations, junction boxes, pull boxes and wireways. Apply tape, butt lapped, or paint for a minimum distance of 2" and, where applied to ends of conductors, start at cut end of the conductor insulation. Tape shall not cover manufacturers conductors shall be color coded or labeled as necessary for clear identification. Color coding of all conductors shall be as follows:

TABLE ON NEXT PAGE

Grounding

Bare or Green

120/208 volt Three Phase (wye)

Phase Conductors:

Neutral:

A-Black, B-Red, C-Blue

White

277/480 volt Three Phase (wye)

Phase Conductors:

Neutral:

A-Brown, B-Orange, C-Yellow

Natural Grey

2. All circuits are to be run with a neutral conductor: No shared neutral conductors are allowed.
3. Suitable bushings, shields or fittings having smooth rounded edges shall be provided where conductors pass between wire ways, through partitions, around bends, between wire ways and cabinets or junction boxes, and at other locations where necessary to prevent abrasion of the insulation of the conductors. As a clarification, this also applies to conduits stubbed into the ceiling.

2.9 JUNCTION AND PULL BOXES

- A. Junction and pull boxes shall meet requirements of National Electrical Code. Standard manufactured boxes shall be listed by Underwriters' Laboratories, Inc. Where custom designed and fabricated boxes are needed, they shall meet the construction standards of Underwriters' Laboratories, Inc. and the N.E.C.
- B. Junction and pull boxes shall be installed where required by National Electrical Code and where necessary to facilitate pulling of wire or cable. Considerations are sizes of wire and cable, number of bends in raceway, and conductor support requirements in vertical raceways. Maximum distance between terminations at junction or pull boxes, cabinets, or other points of termination shall not exceed 250 feet for straight horizontal runs. This length shall be decreased 50 feet for each 90 degree bend. All junction boxes shall be independently and rigidly supported from the building structure. Junction box type shall conform to the area in which it is installed (i.e. wet location areas shall be moisture resistant type junction boxes).
- C. Junction boxes and associated conduit for Fire Alarm shall be painted red. Junction boxes for low voltage controls, communication, technology, etc. shall be permanently marked indicating use.

2.10 OUTLETS

- A. Outlet boxes shall be one piece or projection welded, galvanized stamped steel for gang sizes required. Where several devices are located on drawings in the same general location, use multi-gang boxes. Sectional boxes are not acceptable. Boxes shall be sized in accordance with National Electrical Code. Boxes required for communications systems, mechanical control devices, etc., shall be installed under this section of the specifications. Verify outlet box locations and sizes required for systems other than electrical power from shop and manufacturer's drawings, and install outlets as per those requirements.
- B. Boxes for wall and ceiling outlets shall finish flush and straight. Wall outlets in exposed concrete block, masonry, and tile walls shall be installed with extra deep square corner boxes or with standard boxes and square cornered tile wall covers so that conduit offsets are not required. Openings in concrete blocks or masonry walls shall be saw cut with an opening tolerance of 1/8" on all sides, the opening shall have bottom of box at nearest masonry joint to dimension indicated. For other wall finishes, boxes shall be installed with plaster or device type covers as required. No outlets shall be installed back-to-back. Where outlets occur in stud walls back to back on opposite sides, they shall be isolated by a solid stud between them or shall have a 24" separation. For boxes installed in a fire rated barrier, a U.L. approved putty pad shall be installed as required.

2.11 WIRING DEVICES

- A. Colors: Wiring device and plate colors shall be selected by Architect.

- B. Receptacles: Duplex receptacles shall be specification grade, 20 amps, 125 volts with grounding terminal. The receptacles are to be rigidly secured independent of device plate and such that the device plate secures to the device as the design specifies.
- C. Switches: Standard flush tumbler switches shall be specification grade, 20 amps, 120/277 volts A-C only, single pole, three-way or four-way as shown, single throw with screw terminals arranged for side wiring. The switches are to be rigidly secured independent of device plate and such that the device plate secures to the device as the design specifies.
- D. Device Plates: Shall be of the specification grade high impact resistant, stainless steel plates. The nominal thickness is to be .070". Color to match device.
- E. Ground Fault Receptacles: Furnish and install receptacles with ground fault circuit interrupters as indicated on plans. Receptacles shall be NEMA 5-20R configuration with 120V ac 20 amperes circuit rating. All receptacles shall be such depth as to permit mounting in outlet boxes 1-1/2" or greater in depth without the use of spacers. Units shall have line and load terminals such that connection to load terminals will provide ground fault protection for other receptacles. All receptacles shall accept standard duplex wall plates. All receptacles shall be noise suppressed and shall be UL listed. Any device located within 76" of a source of water is to be GFCI protected.
- F. All devices are to be installed such that devices do not move when in normal use. The device plate shall not be used to secure device in place.

2.12 LIGHTING FIXTURES

- A. Provide wired, cleaned, and with lamps specified, all fixtures designated on drawings. Contractor shall verify the ceiling construction for correct trim and support arrangement of lighting fixtures; corrosion resistant plaster frames are required in plaster ceilings. Shop drawing submittals shall consist of properly identified copies of manufacturer's catalog pages showing all features and accessories specified.
- B. Secure mounting and support of all lighting fixtures shall be accomplished under this section of these specifications. Lighting fixtures shall be installed plumb, square, and level with the ceiling, wall, and in alignment with adjacent lighting fixtures. Mounting heights indicated shall be to the bottom of the fixture for ceiling-mounted fixtures and to center of fixture for wall-mounted fixtures. Lay-in troffer fixtures shall be supported with a minimum of 4 ceiling support wires per fixture and not more than 6 inches from each corner of the fixture. For fixtures smaller in size than the ceiling grid, provide a minimum of four wires per fixture. Do not support fixtures by ceiling acoustical panels. All concealed fixture mounting accessories shall be securely tied to structure. Flexible connections to fixtures shall not exceed 6 feet in length. Fixtures shall be solidly grounded to raceway system.
- C. In areas where the reflected ceiling plan is shown, all work shall be in conformance with this plan. If the ceiling grid is installed other than shown on the electrical plan, it shall be the responsibility of the installer of the lighting fixtures to call this fact immediately to the attention of the Architect and Contractor, and work shall not proceed until Architect's decision in the matter is obtained.
- D. Fluorescent ballasts shall be electronic type, class A noise rating, class P safety standards, high power factor greater than .98, programmed start, auto restart, 10% total harmonic distortion or less, 42 kHz – 54 kHz hertz ballast frequency, .85 or greater ballast factor, less than 1.7 lamp current crest factor, meeting the requirements of ANSI/IEE C62.41 & C82.11, FCC Part 18 (RFI & EMI), CBM, UL, Public Law No. 100-357, and NAECA. All ballasts shall include internal fusing. Ballast shall be compatible for use with energy saving lamps. For outdoor applications, ballast shall be rated for zero degrees Fahrenheit starting temperature.
- E. High Intensity Discharge (HID) lamp ballasts shall be high power factor type greater than .98, protected by in-line fuse, UL 1029, UL class P, ANSI C82.4, 15% total harmonic distortion or less, 100 kHz – 200 kHz ballast frequency, end-of-life detection and shutdown. Ballasts in fixtures for interior spaces shall be encapsulated in a Class H potting compound to provide a Class A noise rating. Ballasts in fixtures installed outdoors shall be weatherproof. Provide 0 degrees Fahrenheit starting temperature for HID below 250W. Provide -20 degrees Fahrenheit starting for HID 250W and above.

- F. LED drivers shall be highly efficient, class A noise rating, 0.9 or greater power factor, power supplies rated for the wattage requirements of the fixture. THD at full load shall be <10% at 120v and <20% at 277v. <3% line regulation, <1W stand-by power. LED power up time to be <1 sec. Load regulation <5%. Provide over voltage protection, non-latching output short circuit protection, current reduction LED load temperature protection. Ambient operating temperature range -30 degrees Celsius to 50 degrees Celsius at 85% non-condensing relative humidity. Driver shall meet ANSI C62.41 Cat.A 2.5kv transient protection. Power supply shall be field programmable with 1mA resolution. Programmer shall not require the power supply to be powered up or connected to AC line voltage while programming. Provide integrated configurable LED thermal protection. Drivers shall be universal voltage input. Power supply shall be UL Class 2. LED dimming drivers shall provide continuous flicker-free dimming from 100%-1%.
- G. All lamps shall be the product of one manufacturer and shall be as manufactured by General Electric Osram/Sylvania, or Phillips. HPS lamps shall comply with the current published ANSI standards.

2.13 TELEPHONE SYSTEM

- A. The Contractor shall furnish and install PVC 40, EMT, boxes, etc. as appropriate, for telephone cables. All turns shall be made with no more than two (2) bends to a run. All telephone conduit is to have bushings provided at both terminated ends. The electrical contractor shall consult the local telephone company for complete rules and regulations and the telephone conduit shall be installed according to these rules.

2.14 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protections: Take necessary precautions to protect all material, equipment, apparatus, and work from damage. Failure to do so to the satisfaction of the Architect will be sufficient cause for the rejection of the material, equipment, or work in question. Contractor is responsible for the safety and good condition of the materials installed until final acceptance by the Owner.
- B. Cleaning: Conduit openings shall be capped or plugged during installation. Fixtures and equipment shall be tightly covered and protected against dirt, moisture, chemical, and mechanical injury. At the completion of the work, the fixtures, material and equipment shall be thoroughly cleaned and delivered in condition satisfactory to the Architect.

PART 3 - EXECUTION

3.1 EXCAVATION, TRENCHING AND BACKFILLING

- A. Trenches for all underground conduits shall be excavated to the required depth. The bottom of trenches shall be tamped hard. Before backfilling the excavation shall be cleaned of trash and debris. Backfill shall consist of excavation or borrow of sand, gravel, or other approved material free of trash, lumber, sawdust or other debris. Backfill shall be placed in 9" thick moistured and hand or machine tamped layers. Backfill shall be brought to suitable elevation above ground to provide for anticipated settlement and shrinkage. All paving broken up shall be repaired and returned to the original condition.

3.2 PAINTING

- A. Contractor shall touch-up or refinish all items of electrical equipment furnished with a factory finish coat of paint and which may have been damaged regardless of cause.

3.3 TESTING AND BALANCING

- A. Balance all single-phase loads connected to all panelboards to ensure an approximate equal division on these loads on main power supply serving building. All tests shall be made in accordance with the latest standards of the IEEE and the NEC. The installation shall be tested for performance, grounds and insulation resistance. "Megger" type instruments shall be used. Contractor shall perform circuit continuity and operational tests on all equipment furnished or connected by Contractor. The tests shall be made prior to final inspection. The Contractor shall provide all testing equipment and all costs shall be borne by him. Written reports shall be made

of all tests. These reports shall be turned over to the Architect at time of final inspection. All faults shall be corrected immediately.

3.4 CLEANING UP

- A. The Contractor shall remove all oil, grease, or other stains resulting from his work performed in the building or the exterior thereof.

3.5 WARRANTY AND MAINTENANCE

- A. The Electrical Systems and associated materials shall be covered by the warranty for a period of one year. All materials, installation, and workmanship shall be warranted during the warranty period. That is, any item will be repaired at no charge for any defects for one year after the date of acceptance.

END OF SECTION

SECTION 16110 - LIGHTING CONTROLS

PART 1 - GENERAL

1.1 INTRODUCTION

- A. The work covered in this section is subject to the requirements in the General Conditions of the Specifications. Contractor shall coordinate the work in this section with the trades covered in other sections of the specification to provide a complete and operable system.

1.2 SYSTEM DESCRIPTION

- A. Extent of lighting control system work is indicated by drawings and by the requirements of this section. It is the intent of this section to provide an integrated, energy saving lighting control system including Lighting Control Panels, Occupancy Sensors, and Daylighting Controls from a single supplier. Contractor is responsible for confirming that the panels and sensors interoperate as a single system.

1.3 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in the manufacture of lighting control equipment and ancillary equipment, of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Comply with NEC, NEMA, and FCC Emission requirements for Class A applications.
- C. UL Approvals: Relay panels and accessory devices are to be UL listed under UL 916 Energy Management Equipment. Configured to order or custom relay panels shall be UL Listed under UL 508, Industrial Control Panels.

1.4 SUBMITTALS

- A. Submit manufacturer's data on lighting control system and components including shop drawings, detailed point to point wiring diagrams, and floor plans showing occupancy and daylighting sensor locations. Provide typical mounting details for occupancy and daylighting sensors for this application.

1.5 MANUFACTURERS

- A. This specification is based on products from Watt Stopper/Legrand, Santa Clara, CA. Any other system wishing to be considered must submit descriptive information 10 days prior to bid. Prior approval does not guarantee final approval by the electrical engineer. The contractor shall be completely responsible for providing a system meeting this specification in its entirety. All deviations from this specification must be listed and individually signed off by the consultant.

PART 2 - PRODUCTS

2.1 OCCUPANCY SENSORS AND POWER PACKS

- A. Occupancy Sensors: Provide sensors as indicated on the drawings.
- B. Dual technology sensors shall:
 - 1. Be installed and programmed as indicated on the drawings.
 - 2. Use passive infrared and ultrasonic technologies for occupancy detection. Products that react to noise or ambient sound may be provided as equal.
- C. Ultrasonic sensors shall:
 - 1. Utilize Advanced Signal Processing to adjust the detection threshold dynamically to compensate for constantly changing levels of activity and airflow throughout controlled space.
 - 2. Have an ultrasonic operating frequency that is crystal controlled at 25 kHz within $\pm 0.005\%$ tolerance, 32 kHz within $\pm 0.002\%$ tolerance, or 40 kHz $\pm 0.002\%$ tolerance to assure reliable performance and eliminate sensor cross-talk. Sensors using multiple frequencies are

not acceptable.

- D. All sensors shall be capable of operating normally with electronic ballasts, PL lamp systems and rated motor loads.
- E. Coverage of sensors shall remain constant after sensitivity control has been set. No automatic reduction shall occur in coverage due to the cycling of air conditioner or heating fans.
- F. All sensors shall have readily accessible, user adjustable settings for time delay and sensitivity. Settings shall be located on the sensor (not the control unit).
- G. All sensors shall provide an LED as a visual means of indication at all times to verify that motion is being detected during both testing and normal operation.
- H. Circuit Control Hardware – (POWER PACKS)
- I. Control Units - For ease of mounting, installation and future service, control unit(s) shall be able to externally mount through a 1/2" knock-out on a standard electrical enclosure and be an integrated, self-contained unit consisting internally of an isolated load switching control relay and a transformer to provide low-voltage power. Control unit shall provide power to a minimum of two (2) sensors.
- J. Relay Contacts shall have ratings of:
 - 1. 13A - 120 VAC Tungsten
 - 2. 20A - 120 VAC Ballast
 - 3. 20A - 277 VAC Ballast
 - 4. 20A – 347 VAC Ballast
- K. Control wiring between sensors and control units shall be Class II, 18-20 AWG, stranded U.L. Classified, PVC insulated or TEFLON jacketed cable suitable for use in plenums, where applicable:
 - 1. Minimum acceptable wire gauge from the circuit control hardware relays shall be #14 AWG.

2.2 EXTERIOR PHOTOCELLS

- A. Each photocell shall be mounted in the appropriate location for measuring the available daylight. Each photocell will have a separate control/calibration module mounted separately and in an accessible location.

PART 3 - EXECUTION

3.1 SUPPORT SERVICES

- A. Service Description
 - 1. System Startup:
 - a. Manufacturer shall provide a factory authorized technician to confirm proper installation and operation of all system components. The startup requirement is intended to verify:
 - That all occupancy and daylighting sensors are located, installed, and adjusted as intended by the factory.
 - The occupancy sensors and daylighting sensors are operating within the manufacturers specifications.
 - The sensors interact as a complete and operational system to meet the design intent.
 - Manufacturer to provide a written statement verifying that the system meets the above requirements.
 - 2. Training:
 - a. Manufacturer shall provide factory authorized technician to train owner personnel in

the operation, programming and maintenance of the lighting control system.

3. Documentation:

a. Manufacturer shall provide system documentation including:

- System one-line showing number and type of switches and sensors, dataline. Typical wiring diagrams for each component.

b. The manufacturer will certify that the products will meet the product specifications and local energy codes. If any additional equipment is required to meet the coverage patterns or local energy codes, the manufacturer will provide the additional equipment at no cost to the owner.

4. Programming:

a. Manufacturer shall provide system programming including:

- Wiring documentation.
- Switch operation.
- Operating schedules.

END OF SECTION

SECTION 16200 – SURGE SUPPRESSION DEVICE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions, Special Conditions, Mechanical and Electrical Supplementary Requirements 15000/16000, and Division 1 Specification sections, apply to work specified in this section.

1.2 DEFINITIONS

- A. LED: Light Emitting Diode
- B. SCR: Silicon Controlled Rectifier
- C. SPD: Transient Voltage Surge Suppressor

1.3 SUBMITTALS

- A. Provide submittals for all required testing and pertinent manufacturer information described herein. Submittals for products by manufacturers not listed as “acceptable” below, must submit proper documentation showing detailed (line-by-line) compliance with this specification not less than fifteen (15) business days prior to bid date, to allow ample engineering time for review of submitted products. Prior approvals not received by the deadline date defined above will not be considered. Along with the line-by-line comparison from manufacturers not listed herein, surge suppression submittals shall include, but shall not be limited to the following items:
- B. Dimensioned drawing of each suppressor type indicating mounting arrangement. Manufacturer shall include its UL 1449 Second Edition file number(s). Manufacturer shall include its UL 1283 file number(s). Letter from manufacturer verifying SPD incorporates “directly-connected-protection -elements” between all possible modes in every given service rating (i.e. line-to-neutral, line-to-line, line-to-ground, neutral-to-ground). Certified test data documenting IEEE C62.41.2 performance (as defined herein), and the ability of the device to meet or exceed all requirements of this specification. Warranties: As specified in this Section.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: At least 10 years of engineering experience in the design and manufacture of permanently connected SPD devices.
- B. Operates a Quality System Certified manufacturing facility as ISO 9001:2000 Compliant.

1.5 CODES AND REFERENCED STANDARDS

- A. UL 1449 2nd Edition listed, UL 1283 listed, CUL, ANSI/IEEE C62.41.1-2002, C62.41.2-2002, C62.45-2002, NEMA LS-1, 1992 2.2.7, IEEE Std. 1100-1999 Section 8.6.1
- B. ANSI C84.1, American National Standard for Electric Power Systems and Equipment – Voltage Ratings.
- C. National Electrical Code (NEC) Article 285

1.6 SUPPRESSOR LOCATIONS

- A. Provide surge suppressor at each building service entrance switchboard and at other panelboard locations as indicated on the Contract Drawings. SPD Devices are to be mounted integrally to the panels.

1.7 MANUFACTURERS

- A. The listing of a manufacturer as “acceptable” does not imply automatic approval. It is the sole responsibility of the Contractor to ensure that any submittals made are for products that meet or exceed the specifications included herein. Subject to compliance with requirements, provide products by the following manufacturer(s) or approved equal as described above:

1. Commonality: All SPD devices at the service entrance, distribution panels and sub-panels

shall be provided by same SPD manufacturer.

B. Approved equals will be accepted (see submittal procedures per section 16100).

1.8 GENERAL REQUIREMENTS

- A. SPD devices shall be rated for the class of service necessary for the application.
- B. SPD devices shall be designed for AC power systems with a minimum of AC follow current after operation.
- C. The SPD shall have sine-wave tracking capability.
- D. Manufacturer shall provide permanently-connected devices mounted parallel to the service, distribution and sub panels and series connected devices as required for individual equipment protection as indicated on Contract Drawings. SPD device drawings shall be made available upon request.
- E. SPD circuitry shall include only solid-state clamping components to limit the surge voltage and divert the surge current. SPD components that "crowbar" (e.g. spark gaps, gas tubes, SCR's, etc...) shall not be accepted. Device circuitry shall be bi-directional, enclosed in a UL listed encapsulated thermal stress reducing compound and be of a parallel design.

Electrical performance characteristics:

Service ratings:

120/20
8V
277/48
0V

Three-
phase

4-
wire
+
Gnd

Wye

Other voltages (as indicated on the drawings)

SPD ratings: SPD devices supplied shall meet or exceed (as a minimum) the capabilities listed below:

Modes Of Protection Required (10) TEN independent, dedicated, discrete modes of protection required)	^b Max. ANSI/IEEE Let-Through Voltage Category C (Main Service) 208/480 3PH	^b Max. ANSI/IEEE Let-Through Voltage Category B (Distribution) 208/480 3PH	^c Max. ANSI/IEEE Let-Through Voltage Category A (Branch) 208/480 3PH	Peak Surge Current ^a "kA" (Per Phase)		
				**Service Entrance	**Dist. Panels	**Branch Panels
L-N	940/1250	410/580	40/70	360kA	240kA	180kA
L-L	1200/1450	600/800	40/145	360kA	240kA	180kA
L-G	835/1150	410/600	60/100	360kA	240kA	180kA
N-G	880/1450	675/1100	60/70	360kA	240kA	180kA

** For clarification purposes, higher (and lower) peak surge current (PSC) ratings are required for specific panels. Please verify the Peak Surge Currents per the amperages of the equipment that is being protected, are in accordance with the recommendations below:

4000 Amps and Higher = 600kA "per phase"
3000 Amps – 4000 Amps = 480kA "per phase"
2000 Amps – 3000 Amps = 360kA "per phase"

800 Amps – 1600 Amps = 240kA "per phase"
225 Amps – 800 Amps = 180kA "per phase"
100 Amps – 225 Amps = 120kA "per phase"

^a kA “per phase” value is determined by the following:

[kA “per mode” (x) # of modes available, subtract N-G value, divide the remaining kA by phase(s). The sum will be your kA “per phase”]

^b Measured at IEEE C62.41.2-2002 Category C High; 20kV 1.2x50 μ S/10 kA 8 x 20 μ S waveform & Category C Low/B High; 6kV, 1.2x50 μ S/3 kA 8 x 20 μ S waveform. Transient shall be applied at the 90° phase angle unless otherwise indicated above.

^c Measured at IEEE C62.41.2-2002 Category A-Ringwave at 2kV 0.5 μ S/67A 100kHz. Transient shall be applied at the 270° phase angle, positive polarity unless otherwise indicated above.

Measured Limiting Voltage Test Environment: All voltages shall be peak ($\pm 10\%$) Positive Polarity, Time base = 20 μ S, Sampling Rate = 250ms/s to ensure maximum transient capture. Surge voltages shall be measured from the insertion of the surge on the sine wave to the peak of the surge. All tests are Static (un-powered), except for the 120V circuits which are Dynamic (powered). All tests shall be performed in accordance with UL 1449 Second Edition with measurements performed at a point on the leads 15.24 cm (6 inches) outside of the device enclosure. No data measured at a module, lugs, component, or undefined location will be accepted.

Modes: The SPD system shall provide dedicated, independent, distinct protection circuitry for every mode found in the electrical distribution system at the point of SPD application. For example, a 400/230V, 3-phase Wye, 4-wire plus ground system has TEN (10) distinct modes that require independent and dedicated protection (i.e., L1-L2, L2-L3, L3-L1, L1-N, L2-N, L3-N, L1-G, L2-G, L3-G, N-G). For 6 mode Delta systems, SIX (6) dedicated, independent, distinct protection modes are required (L1-L2, L2-L3, L3-L1, L1-G, L2-G, L3-G).

F. Fusing:

1. The SPD shall provide as a minimum, over-current, over temperature protection in the form of component-level thermal fusing to ensure safe failure and prevent thermal runaway. Surge protective devices shall contain short circuit current safety fusing within each device where no circuit breaker is specified, for over-current requirements of the NEC.
2. The fusing mechanisms employed must effectively coordinate their performance in conjunction with the high current abnormal over-voltage testing under UL 1449 2nd Edition.

G. The Transient Voltage Surge Suppressor (SPD) shall be of a parallel design using fast-acting transient energy protection that will divert and dissipate the surge energy.

H. The SPD shall be self-restoring and fully automatic with a total response time approximately 1 nanosecond.

I. The maximum continuous operating voltage shall be capable of sustaining 115% of nominal RMS voltage continuously without degrading.

J. The SPD shall be UL listed at or above the available fault current level at the point of SPD application, per UL 1449 2nd Edition, as amended. The SPD shall be marked with the short circuit current rating. The SPD short circuit rating shall be, as a minimum, the same rating as the power distribution equipment to which it is connected.

K. Circuit Configuration: The circuit configuration of the suppression units shall be bi-directional, thermal stress reducing, totally encapsulated, custom parallel and solid state.

L. Features: Surge protective devices shall provide on-board visual status of their operational readiness by LED indicator lights.

M. Maintenance Restrictions: No suppression unit shall be supplied which requires scheduled preventive- maintenance or replacement parts. Units requiring functional testing, special test equipment, or special training to monitor surge protection device (SPD) status are not acceptable. SPD devices shall require no routine maintenance. SPD devices are considered non-repairable items and shall be fully replaced upon expiration.

N. Warranty: The manufacturer shall provide unlimited free replacement of the entire SPD (not just modules, components or sub-assemblies) for all inoperable SPD during the warranty period. Minimum warranty period shall be 10 (ten) years.

- O. Enclosures: Unless otherwise noted, NEMA 4 (or better) enclosures for indoor installations where fire suppression systems are utilized and NEMA 4X or better enclosures for outdoor/wet locations shall be utilized.

PART 2 - PRODUCTS

Not applicable.

PART 3 – EXECUTION

3.1 EXECUTION

- A. Provide surge suppressor to be installed at each building service entrance gear, transfer switch, or other location (service entrance), that the service encounters as it enters the facility and/or as indicated on Contract Drawings. Also, provide SPD devices at all distribution and panel-board locations as indicated on Contract Drawings. The SPD shall be located immediately adjacent to the switchboard or panel-board being protected (close-nipple). (The SPD may not be located integral within the switchboard or panel-board(s) unless the switchgear manufacturer providing such products expressly meets or exceeds all parameters of this specification for the SPD.) Any SPD devices not meeting or exceeding the performance of this specification will be deemed unacceptable. The surge protection devices shall be connected on the load side of the over-current protective device to which it is connected as per UL 1449 and NEC Art. 285, of the electrical service it is protecting. Unless otherwise specified, provide a 30A breaker for each SPD device.

****NOTE**** SPD marked L1, L2, L3, N, and GND (as applicable) must be connected, respectively, to phase(s), neutral, and ground.

- B. Surge protective devices shall be installed neatly. Bind the phase, neutral, and ground conductors tightly, over the entire run, from the suppressor to the service panel, and always use the shortest length of connecting cable possible.
- C. Connect surge protector to the grounding system.
 - 1. The electrical contractor (installer) shall verify the proper application of the SPD (i.e., voltage, phases, etc.). The electrical contractor shall assure that all Neutral conductors are bonded to the system Ground at the service entrance or the serving isolation transformer prior to installation of the associated SPD. The electrical contractor shall further ensure that neutral-to-ground bonds do not exist at locations that are not service entrances or newly derived power sources.
- D. All labor, materials, equipment, and services necessary for, and incidental to, the installation of the SPD system components as specified herein shall be provided by the electrical contractor (installer).

END OF SECTION

SECTION 16300 - LOW VOLTAGE DRY TRANSFORMERS

PART 1 - GENERAL

1.1 GENERAL

- A. Self-cooled, dry type two winding power transformer for general power and lighting application. Listed by Underwriters' Laboratories, Inc., and labeled with appropriate listing mark. Single or three phase as indicated with KVA rating as indicated. Separate coil for each phase of three phase units. Unless otherwise indicated, designed for 480 volt primary. Three phase transformers connected delta-wye with 120/208 volt wye secondary unless otherwise indicated. Single-phase units with 120/240 volt secondary unless otherwise indicated. Enclosure for indoor application. Ventilation openings, corrosion treatment, cable space, ground pad, wiring compartment temperature, and wiring terminations in accordance with UL 506.
- B. Primary Taps: 25 KVA and smaller; four 2-1/2% taps, two above and two below normal. Larger than 25 KVA; six 2½% taps, two above and four below normal.
- C. Temperature Classification: 25 KVA and smaller; 185°C insulation system temperature classification, 115°C winding temperature rise. Larger than 25 KVA; 220°C insulation system temperature classification, 115°C winding temperature rise.
- D. Load Rating: Capable of operating continuously at full nameplate rating in 40°C ambient. Capable of withstanding daily overload requirements of ANSI-C57.12 with no loss in normal life expectancy.
- E. Sound Rating: In accordance with ANSI-C89 and NEMA standard sound ratings.
- F. Impedance: 75 KVA and smaller; 3.0% impedance, minimum. Larger than 75 KVA; 4.5% impedance, minimum.
- G. 15KVA and Smaller: May be wall mounted with suitable frame supports providing wall is of sufficient strength to adequately support imposed load, and providing such method is acceptable to Architect, unless otherwise indicated on the drawings.
- H. Larger than 15 KVA: Floor mount unless indicated otherwise on the drawings.
- I. For non linear loads use a minimum of K-13 or as shown on drawing.
- J. Transformers are to have copper windings and be NEMA-TP1 rated.
- K. Acceptable: General Electric; Siemens; Westinghouse; Sorgel; Schneider; Eaton; HPS

END OF SECTION

SECTION 16720 - FIRE DETECTION AND ALARM SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To
 - 1. Furnish and install a fire alarm and detection system as described in Contract Documents.
 - 2. Furnish and install raceway, conductors, boxes, and miscellaneous items necessary for complete system.
- B. Related Sections
 - 1. Division 16 - Quality and installation standards for wiring, raceway, conduit, and boxes.

1.2 SYSTEM DESCRIPTION

- A. An automatic fire alarm system consisting of control panel, power supplies, alarm initiating devices, and notification appliances.
- B. Class B (Style B) initiating device circuits and Class B (Style W) notification appliance circuits including end-of-line devices.
- C. Performance Requirements.
 - 1. Operation of manual station or automatic activation of any smoke detector, shall:
 - a. Cause system notification appliances to operate.
 - b. Indicate device in alarm at control pane LCD display.
 - c. Indicate device in alarm on remote annunciator LCD display
 - d. Initiate off-site alarm notification system.
 - 2. System shall return to normal when operated device is returned to normal and control panel is manually reset, except alarms may be silenced as specified below.
 - 3. Alarm may be silenced by switch in control panel.
 - a. Ring Back Feature - When silenced, this shall not prevent the resounding of subsequent alarms if another zone should alarm.
 - 4. When alarms are silenced, indicating red LEDs on control panel and remote annunciator shall remain on until operated device is returned to normal and control panel is manually reset.
 - 5. Green pilot LED shall normally be on indicating that system is receiving normal power. Failure of normal power shall cause this LED to extinguish.
 - 6. Amber trouble LED and trouble alarm, operating together, shall signal trouble condition.
 - a. Following conditions shall signal trouble condition:
 - Failure of normal power.
 - Opens or short circuits on indicating circuits.
 - Disarrangements in system wiring.
 - Control panel circuit board removal.
 - Ground faults.
 - b. Trouble silencing switch shall silence trouble alarm which shall be arranged so trouble LED shall remain lit until system is restored to normal. As ring-back feature, trouble alarm shall resound as reminder to return silencing switch to normal position.
 - 7. Supervisory LED, separate from trouble LED, and alarm, operating together, shall signal

opening of door shown on drawings. Alarm silence switch shall operate in same manner as trouble alarm.

1.3 SUBMITTALS

A. Shop Drawings:

1. Prepared by authorized factory representative and including:
 - a. Single line diagram of actual system. Typical riser diagrams are not acceptable.
 - b. Complete wiring diagrams.
 - c. Manufacturer's original catalog data and descriptive information on each piece of equipment to be used.
 - d. All documentation and submittals required by the Authority having jurisdiction are to be submitted within 30 day of the contract award.
 - e. Approval of the Authority Having Jurisdiction and permitting are required before work on the project is to commence.

B. Quality Assurance/Control - Certificate of completion, from Manufacturer's Representative, in accordance with NFPA 72 requirements.

C. Closeout:

1. Operations And Maintenance Manual Data:
 - a. Provide operating and maintenance instructions for each item of equipment submitted under Product Data. Provide instruction manual from Manufacturer which explains what is to be done in event of various indications.
 - b. Include copy of approved shop drawings.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:

1. System shall meet approval of Authority Having Jurisdiction (AHJ). NEC and local ordinances and regulations shall govern unless more stringent requirements are specified.
2. Equipment, devices, and cable shall be UL or Factory Mutual listed for use in fire alarm systems.

1.5 OWNER'S INSTRUCTIONS

- #### **A. Instruct Owner's representative in proper operation and maintenance procedures.**

PART 2 - PRODUCTS

2.1 COMPONENTS

- #### **A. Equipment and accessories furnished under terms of this Specification shall be standard products of single manufacturer, or include written statement by Control Panel Manufacturer confirming compatibility of components and inclusion of these components under system warranty.**
- #### **B. Main FACP or network node shall contain a microprocessor based Central Processing Unit (CPU) and power supply. The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, printer, annunciators, and other system controlled devices.**
- #### **C. Operator Control**
1. Acknowledge Switch:
 2. Activation of the control panel acknowledge switch in response to new alarms and/or troubles shall silence the local panel piezo electric signal and change the alarm and trouble LEDs

- from flashing mode to steady-ON mode. If multiple alarm or trouble conditions exist, depression of this switch shall advance the LCD display to the next alarm or trouble condition.
3. Depression of the Acknowledge switch shall also silence all remote annunciator piezo sounders.
 - D. Alarm Silence Switch: Activation of the alarm silence switch shall cause all programmed alarm notification appliances and relays to return to the normal condition after an alarm condition. The selection of notification circuits and relays that are silenceable by this switch shall be fully field programmable within the confines of all applicable standards. The FACP software shall include silence inhibit and auto-silence timers.
 - E. Alarm Activate (Drill) Switch: The Alarm Activate switch shall activate all notification appliance circuits. The drill function shall latch until the panel is silenced or reset.
 - F. System Reset Switch: Activation of the System Reset switch shall cause all electronically-latched initiating devices, appliances or software zones, as well as all associated output devices and circuits, to return to their normal condition.
 - G. Lamp Test: The Lamp Test switch shall activate all local system LEDs, light each segment of the liquid crystal display and display the panel software revision for service personnel.
 - H. System Capacity and General Operation:
 1. The control panel or each network node shall include Form-C alarm, trouble, and supervisory relays rated at a minimum of 2.0 amps @ 30 VDC.
 2. It shall include Class B (NFPA Style Y) or Class A (NFPA Style Z) programmable Notification Appliance Circuits.
 3. The Notification Appliance Circuits shall be programmable to Synchronize with System Sensor, and Notification Appliances.
 4. The system shall include a full featured operator interface control and annunciation panel that shall include a backlit Liquid Crystal Display (LCD), individual color coded system status LEDs, and an alphanumeric keypad with easy touch keys for the field programming and control of the fire alarm system.
 5. The system shall be programmable, configurable, and expandable in the field without the need for special tools, PROM programmers or PC based programmers.
 6. The system shall allow the programming of any input to activate any output or group of outputs
 7. The FACP or each network node shall provide the following features:
 - a. Drift compensation to extend detector accuracy over life. Drift compensation shall also include a smoothing feature, allowing transient noise signals to be filtered out.
 - b. Detector sensitivity test, meeting requirements of NFPA 72, Chapter 7.
 - c. Maintenance alert, with two levels (maintenance alert/maintenance urgent), to warn of excessive smoke detector dirt or dust accumulation.
 - d. Multiple sensitivity levels for alarm, selected by detector. The system shall also support sensitive advanced detection laser detectors. The system shall also include multiple levels of Prealarm, selected by detector, to indicate impending alarms to maintenance personnel.
 - e. The ability to display or print system reports.
 - f. Alarm verification, with counters and a trouble indication to alert maintenance personnel.
 - g. PAS presignal, meeting NFPA 72 3-8.3 requirements.
 - h. Devices shall meet NFPA 72 Chapter 1 requirements for activation of notification circuits within 10 seconds of initiating device activation.

- i. Periodic detector test, conducted automatically by the software.
 - j. Self optimizing pre-alarm for advanced fire warning, which allows each detector to learn its particular environment and set its prealarm level to just above normal peaks.
 - k. Cross zoning with the capability of counting: two detectors in alarm, two software zones in alarm, or one smoke detector and one thermal detector.
 - l. Walk test, with a check for two detectors set to same address.
 - m. Day/night automatic adjustment of detector sensitivity.
- 8. The FACP shall be capable of coding main panel node notification circuits in March Time (120 PPM), and Temporal (NFPA 72 A-2-2.2.2). Panel notification circuits (NAC 1,2,3 and 4) shall also support Two-Stage operation. Two stage operation shall allow 20 Pulses Per Minute (PPM) on alarm and 120 PPM after 5 minutes or when a second device activates.
- I. Network Communication
 - 1. The FACP shall be capable of communicating on a Local Area Network (LAN), a firmware package that utilizes a peer-to-peer, inherently regenerative communication format and protocol.
 - 2. Central Microprocessor
 - a. The microprocessor shall be a state-of-the-art, high speed device and it shall communicate with, monitor and control all external interfaces. It shall include an EPROM for system program storage, Flash memory for building-specific program storage, and a "watch dog" timer circuit to detect and report microprocessor failure.
 - b. The microprocessor shall contain and execute all control-by-event programs for specific action to be taken if an alarm condition is detected by the system. Control-by-event equations shall be held in non-volatile programmable memory, and shall not be lost even if system primary and secondary power failure occurs.
 - c. The microprocessor shall also provide a real-time clock for time annotation of system displays, printer, and history file. The time-of-day and date shall not be lost if system primary and secondary power supplies fail. The real time clock may also be used to control non-fire functions at programmed time-of-day, day-of-week, and day-of-year.
 - 3. A special program check function shall be provided to detect common operator errors.
 - 4. An auto-program (self-learn) function shall be provided to quickly install initial functions and make the system operational.
 - 5. For flexibility and to ensure program validity, an optional Windows(TM) based program utility shall be available. This program shall be used to off-line program the system with batch upload/download, and have the ability to upgrade the manufacturers (FLASH) system code changes. This program shall also have a verification utility, which scans the program files, identifying possible errors. It shall also have the ability to compare old program files to new ones, identifying differences in the two files to allow complete testing of any system operating changes. This shall be in compliance with the NFPA 72 requirements for testing after system modification.
- J. System Display
 - 1. The system shall support the following display mode options: 80 character display option. The display shall include an 80-character backlit alphanumeric Liquid Crystal Display (LCD) and a full PC style QWERTY keypad.
 - 2. The display shall provide all the controls and indicators used by the system operator: The 80-character display shall include the following operator control switches: ACKNOWLEDGE, ALARM SILENCE, ALARM ACTIVATE (drill), SYSTEM RESET, and LAMP TEST.
 - 3. The display shall annunciate status information and custom alphanumeric labels for all intelligent detectors, addressable modules, internal panel circuits, and software zones.

4. The display shall also provide Light-Emitting Diodes.
 - a. The 80-character display shall provide 12 Light-Emitting-Diodes (LEDs), that indicate the status of the following system parameters: AC POWER, FIRE ALARM, PREALARM WARNING, SUPERVISORY SIGNAL, SYSTEM TROUBLE, DISABLED POINTS, ALARM SILENCED, Controls Active, Pre-Discharge, Discharge and Abort.
5. The display shall have QWERTY type keypad.
 - a. The 80-character display keypad shall be an easy to use QWERTY type keypad, similar to a PC keyboard. This shall be part of the standard system and have the capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels shall be provided to prevent unauthorized system control or programming.
6. The system shall support the display of battery charging current and voltage on the 80-character LCD display.

K. Voice Command Center (VCC)

1. The facility shall have an emergency voice alarm communication system. Digitally stored message sequences shall notify the building occupants that a fire or life safety condition has been reported. A Message generator shall be capable of automatically distributing up to four (4) simultaneous, unique messages to appropriate audio zones within the facility based on the type and location of the initiating event. The Fire Command Center (FCC) shall also support Emergency manual voice announcement capability for both system wide or selected audio zones, and shall include provisions for the system operator to override automatic messages system wide or in selected zones.
2. The digital audio message generator shall be of reliable, non-moving parts, and support the digital storage of at least 16 or 32 minutes of tones and emergency messages, shall support programming options to string audio segments together to create up to 1000 messages, or to loop messages and parts of messages to repeat for pre-determined cycles or indefinitely.
3. The audio portion of the system shall sound the proper audio signal (consisting of tone, voice, or tone and voice) to the appropriate zones.
4. Notification Appliance Circuits (NAC) speaker circuits shall be arranged such that there is a minimum of one speaker circuit per floor of the building or smoke zone which ever is greater.
5. Audio amplifiers and tone generating equipment shall be electrically supervised for normal and abnormal conditions.
6. Speaker circuits shall be electrically supervised for open and short circuit conditions. If a short circuit exists on a speaker circuit, it shall not be possible to activate that circuit.
7. Speaker circuits shall be either 25 VRMS or 70VRMS. Speaker circuits shall have 20% space capacity for future expansion or increased power output requirements.
8. The emergency voice alarm communication system shall incorporate a Two-way emergency telephone communication system.
9. Two-way emergency telephone communication circuits shall be supervised for open and short circuit conditions.
10. Two-way emergency telephone (Fire Fighter Telephone) communication shall be supported between the Audio Command Center and up to seven (7) remote Fire Fighter's Telephone locations simultaneously on a telephone riser.
11. Means shall be provided to connect FFT voice communications to the speaker circuits in order to allow voice paging over the speaker circuit from a telephone handset.

L. Alarm Initiating Devices:

1. Ceiling Mounted Smoke Detectors - Combination of photoelectric and thermal type.
 - a. Photoelectric type.

- b. Listed under UL Standard 268.
 - c. Provide visual indication of alarm on unit when normally pulsed supervisory LED glows continuously.
- 2. Duct Mounted Smoke Detectors:
 - a. Photoelectric type.
 - b. Listed under UL Standard 268.
- 3. Manual Fire Alarm Boxes:
 - a. Double-action requiring two actions to initiate alarm.
 - b. Box shall mechanically latch when actuated and require key to reset. Key shall match control panel door lock.
- M. Notification Appliances:
 - 1. Combination Horn/Strobe:
 - a. Wall mounted flush or semi-flush.
 - b. Non-coded audible output of 90 dB minimum at 10 feet.
 - c. Integrally mounted flashing light unit with block letters 'FIRE'. Minimum light intensity of 75 candela and flash rate between one and three Hertz.
 - d. Listed under UL Standards 464 and 1971.
 - 2. Strobe Only:
 - a. Wall mounted flush or semi-flush.
 - b. Integrally mounted flashing light unit with block letters 'FIRE'. Minimum light intensity of 75 candela and flash rate between one and three Hertz.
 - c. Listed under UL Standard 1971.
- N. Speakers:
 - 1. All speakers shall operate on 25 VRMS or with field selectable output taps from 0.5 to 2.0 Watts.
 - 2. Speakers in corridors and public spaces shall produce a nominal sound output of 84 dBA at 10 feet (3m).
 - 3. Frequency response shall be a minimum of 400 HZ to 4000 HZ.
 - 4. The back of each speaker shall be sealed to protect the speaker cone from damage and dust.
- O. Accessory Devices: Air handler shutdown relays. Provide and install an addressable interface module at the air handling units to shut down activation of the appropriate level alarm.

2.2 ACCEPTABLE MANUFACTURERS

- A. Cerebrus Pyrotronics, Cedar Knolls, NJ (973) 593-2600
- B. Edwards Systems Technology, Cheshire, CT (203) 699-9300
- C. Faraday Inc, Tecumseh, MI (517) 423-2111
- D. Honeywell, Minneapolis, MN (800) 328-5111
- E. Notifier, Northford, CT (800) 454-9779

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install fire alarm and detection systems as indicated, in accordance with equipment manufacturer's written instructions, and complying with applicable portions of NEC, NFPA and NECA's 'Standard of Installation'.
- B. Mounting Heights:
 - 1. Unless otherwise indicated, mount center of outlets or boxes at following heights above finish floor:
 - a. Manual Fire Alarm Boxes (Pull Stations) - 48 inches
 - b. Fire Alarm Horns/Strobes - 80 inches
- C. Conductors:
 - 1. Install conductors in conduit.
 - 2. Fire alarm system conductors from different devices may be combined in common conduit. Make certain that raceway size and wire quantity, size, and type is suitable for equipment supplied and is within NEC standards. Label pull and junction boxes 'FIRE ALARM'.
 - 3. Install conductors and make connections to elevator control panel and duct smoke detectors.
 - 4. Loop wires through each device on zone for proper supervision. Tee-taps
 - 5. not permitted.
 - 6. Minimum conductor size shall be 14 AWG unless otherwise specified.
 - 7. Do not install ceiling mounted detectors within 3 feet of air discharge grilles. Do not install manual fire alarm boxes close to light switches. Coordinate with other trades as required.

3.2 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service:
- B. Provide factory trained representative to perform complete system testing in presence of Owner's representative and local fire department personnel upon completion of installation.
- C. Test each initiating and annunciating device for proper operation, except fixed temperature heat detectors.
 - 1. Test operation of trouble annunciation on each circuit.
 - 2. Perform complete testing of control panel functions.

3.3 PROTECTION

- A. Provide dust protection for installed smoke detectors until finish work is completed and building is ready for occupancy.
- B. Protect conductors from cuts, abrasion and other damage during construction.

END OF SECTION

SECTION 16730 - GPS WIRELESS CLOCK SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Transmission Systems:
 - 1. G.P.S. Receiver
 - 2. Primary Transmitter
- B. Clocks:
 - 1. Analog (120V)

1.2 RELATED SECTIONS

- A. Division 16: Electrical (120 volt grounded dedicated outlet required for transmitter).

1.3 REFERENCES

- A. This Technical Specification and Associated Drawings
- B. Wireless GPS Satellite Time System User Manual.

1.4 DEFINITIONS

- A. GPS: Global Positioning System, a worldwide system that employs 24 satellites in an integrated network to determine geographic location anywhere in the world, and which employs and transmits atomic time, the most accurate and reliable time.

1.5 SYSTEM DESCRIPTION

- A. GPS wireless clock system shall continually synchronize clocks throughout the facility, and shall be capable of clock readouts in multiple time zones where desired.
- B. The system shall synchronize all clocks to each other. The system shall utilize GPS technology to provide atomic time. The system shall not require hard wiring. Clocks shall automatically adjust for Daylight Savings Time.
- C. Analog Clocks shall be synchronized to within 10 milliseconds 6 times per day, and the system shall have an internal oscillator that maintains plus or minus one second per day between synchronizations, so that clock accuracy shall not exceed plus or minus 0.2 seconds.
- D. The system shall include an internal clock reference so that failure of the GPS signal shall not cause the clocks to fail in indicating time.
- E. The system shall incorporate a "fail-safe" design so that failure of any component shall not cause failure of the system. Upon restoration of power or repair of failed component, the system shall resume normal operation without the need to reset the system or any component thereof.
- F. Clock locations shall be as indicated, and clocks shall be fully portable, capable of being relocated at any time.
- G. The system must operate in accordance with a "Radio Station Authorization", Form FCC 601 – LM, granted by the Federal Communications Commission (FCC). This license will be issued to and held by the end user.

1.6 REGULATORY REQUIREMENTS

- A. Equipment and components furnished shall be of manufacturer's latest model.
- B. The end user will hold a license, known as a "Radio Station Authorization" granted by the FCC.
- C. This license grants the end user protected use for wireless transmission at the designated frequency.

- D. This license will designate a unique "call sign" for each end user.
- E. Transmitter and receiver shall comply with Part 90 of FCC rules as follows:
 - 1. This device may not cause harmful interference, and
 - 2. This device must accept interference received, including interference that may cause undesired operation.
 - 3. Transmitter frequency shall be governed by FCC Part 90.35.
 - 4. Transmitter output power shall be governed by FCC Part 90 257 (b)
- F. System shall be installed in compliance with local and state authorities having jurisdiction.

1.7 SUBMITTALS

- A. Product Data: Submit complete catalog data for each component, describing physical characteristics and method of installation. Submit brochure showing available colors and finishes of clocks.
- B. Operating License: Submit evidence of application for FCC Radio Station Authorization prior to installing equipment. Furnish the license or a copy of the application for the license, to the Owner prior to operating the equipment. The original license must be delivered to the Owner.
- C. Samples: Submit one clock for approval. Approved sample shall be tagged and shall be installed in the work at location directed.
- D. Manufacturer's Instructions: Submit complete installation, set-up and maintenance instructions.
- E. Floor plans indicating the location of system transmitter(s), approved by manufacturer, will be submitted to owner prior to installation.

1.8 SUBSTITUTIONS

- A. Proposed substitutions, to be considered, shall be manufactured of equivalent materials that meet or exceed specified requirements of this Section.
- B. Proposed substitutions shall be identified not less than 10 days prior to bid date.
- C. Other systems requiring wiring and/or conduit between master and clocks will not be accepted.
- D. Other systems using wireless technology in an unlicensed frequency range will not be accepted.
- E. Other systems using wireless technology where the license is held by any party other than the end user will not be accepted.

1.9 QUALITY ASSURANCE

- A. Permits: Obtain operating license for the transmitter from the FCC.
- B. Qualifications:
 - 1. Manufacturer: Company specializing in manufacturing commercial time system products with a minimum of 30 continuous years of documented experience including 4 years' experience producing GPS wireless time systems.
 - 2. Installer: Company with documented experience in the installation of commercial time systems.
 - 3. Prior to installation, a site survey must be performed to determine proper transmitter placement.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all components to the site in the manufacturer's original packaging. Packaging shall contain manufacturer's name and address, product identification number, and other related information.
- B. Store equipment in finished building, unopened containers until ready for installation.

1.11 PROJECT SITE CONDITIONS

- A. Clocks shall not be installed until painting and other finish work in each room is complete.
- B. Coordinate installation of GPS receiver for access to the roof or exterior side wall so that the bracket and related fasteners are watertight.

1.12 SYSTEM STARTUP

- A. At completion of installation and prior to final acceptance, turn on the equipment; ensure that all equipment is operating properly, and that all clocks are functioning.

1.13 WARRANTY

- A. Manufacturer will provide a 5 year warranty on GPS receiver, transmitter, and satellite transmitter. All other components will have a 1 year warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. GPS wireless clock system shall be manufactured by SIOSCAN Wireless, Inc., or approved manufacturer with an equal system.

2.2 SEQUENCE OF OPERATION

- A. Transmitter Operation: When power is first applied to the transmitter, it checks for and displays the software version. It then checks the position of the switches and stores their position in memory. The transmitter looks for the GPS time signal. Once the transmitter has received the GPS time, it sets its internal clock to that time. The transmitter then starts to transmit its internal time once every second. The transmitter updates its internal clock every time it receives valid time data from the GPS.
- B. Analog Clock Operation: Insert batteries: Follow set up procedures detailed in manufacturer's instructions. After initial setup, the clock will shut off the receiver. Six times each day, the microprocessor will activate the receiver and starting with the stored channel, it will again look for a valid time signal. If necessary, the clocks will resynchronize to the correct time.
- C. If the clock has not decoded a valid time signal for a pre-determined number of days, it will go to a step mode.

2.3 EQUIPMENT

- A. General: The clock system shall include a transmitter, a roof or window mounted GPS receiver, indicating clocks, and all accessories for complete operation.
 - 1. GPS Receiver: GPS roof mounted, with 10 foot cable (3m) attached Wireless extension cable available: 200 ft.
 - 2. The GPS Receiver shall be a complete GPS receiver including antenna in a waterproof case, designed for roof or outdoor mounting. Provide mounting bracket for attachment to roof structure.
 - 3. The GPS Receiver cable must be plenum rated where required by local code.
 - 4. Transmitter: Consisting of wireless transmitter with GPS receiver, a surge suppressor/battery backup, and a mounting shelf. Unit shall obtain current atomic time from satellite. The clock system shall transmit time continuously to all clocks in the system.
- B. Transmission:
 - 1. Frequency Range: 72.100 to 72.400 MHz.
 - 2. Transmission Power: 1 watt (30dBm) maximum
 - 3. Radio technology: narrowband FM
 - 4. Number of channels: 16
 - 5. Channel bandwidth: 20 kHz maximum

6. Transition mode: one-way communication
 7. Data rate: 2 KBps
 8. Operating range: 32°F to 158°F (0°C. to 70°C).
- C. Transmitter:
1. Transmitter output power: +26 to +30 dBm
 2. Frequency deviation: +/- 4 kHz
 3. Transmitter power requirements: 120 VAC 60 Hz
 4. Internal power requirements: 5 VDC
 5. Carrier frequency stability: +/- 20 ppm
- D. Transmitter shall have 16 selectable channels to assure interference-free reception. Transmitter shall have the following switches:
1. Time zone adjustment switches for all time zones in the world.
 2. Includes: Eastern, Central, Mountain, Pacific, Alaska, and Hawaii.
 3. Daylight Saving Time bypass switch.
 4. 12-hour or 24-hour display.
- E. Transmitter housing shall be black metal case, 16-3/4 inches (424.4mm) by 12 inches (304.8mm) by 1-7/8 inches (46.4mm) in size.
- F. Antenna shall be 46 inches (1168mm) high, commercial type, mounted on top center of transmitter housing. Antenna gain shall be < 2.2 dB. Antenna polarization shall be vertical.
- G. Transmitter housing shall incorporate a display which shall include the following:
1. Time readout AM and PM indicator if 12-hour time display is set Day and date readout indicator for daylight savings or standard time LED which shall flash red in event of reception problem GPS reception indicator.
 2. Transmitter shall contain an internal clock such that failure of reception from the GPS will not disable the operation of the clocks.
- H. Power supply (included):
1. Input: 120 volt AC 50/60 Hz, 0.4 amps.
 2. Output: 9 volt DC, 1.5 amps.
- I. Surge Protector/Battery Backup (included).
1. Input: 120 volt AC 60 Hz +/- 1 Hz.
 2. Output: 120 volt AC, 500VA, 300 watts
 3. Surge Energy Rating: 365 joules
- J. Additional Equipment:
1. Wireless Receiver Switches: Switches shall receive time packets from the Primary Transmitter and relay the synchronized time to the Satellite Transmitter connected to it. The unit shall include the following:
 - a. Antenna mounted on top of the switch housing, 11-1/2 inches (292mm) long.
- K. Power Supply:
1. Input: 120 VAC 50/60 Hz, 0.4 amps
 2. Output: 9 volt DC, 1.5 amps
 3. RS 232 data cable, 5 feet (1.5mm) long

- L. Daylight Savings Time bypass switch
- M. Dimensions: 4-1/4 inches (108mm) long, 5-3/4 inches (146mm) wide, 1-1/4 inches (31.75mm) deep.
- N. Weight: 12 ounces (.34kg)
- O. Operating Range: 32°F to 158°F (0° to 70°C)
- P. Satellite Transmitters shall receive the signal from the Wireless Receiver Switches and transmit the signal to the devices in its vicinity, which are out of the range from the Master Transmitter. The unit shall include the following:
 - 1. Antenna mounted on top of the housing, 46 inches (1168mm) long.
 - 2. Wireless Receiver Switch:
 - 3. Power Supply:
 - a. Input: 120 VAC, 50/60 Hz, 0.4 amps
 - b. Output: 9 volt DC, 1.5 amps.
 - 4. 6 foot (1.83m) cord
 - 5. Surge Suppressor/Battery Backup
 - 6. Mounting Shelf.
 - 7. Transmission Power: 1 watt maximum
 - 8. 72 MHz frequency.
- Q. Traditional analog clocks (120V): Analog clocks shall be wall mounted. Clocks shall have polycarbonate frame and polycarbonate lens. Face shall be white. Hour and minute hands shall be black.
 - 1. 12-1/2 inch (317.5mm) diameter analog clock:
 - 2. Additional colors, finishes, and dial faces are available from manufacturer.
 - 3. Analog clocks shall be capable of automatically adjusting for Daylight Saving Time. An on-off switch located on the transmitter shall disable this function if desired.
 - 4. Time shall be automatically updated from the transmitter 6 times per day.
 - 5. 9 inch (228.6mm) and 12.5 inch (317.5mm) analog clocks shall have a tamper proof/theft resistant clock lock mounting slots.
 - 6. Provide two alkaline batteries. (9 inch /228.6mm– C cells, 12.5inch/317.5mm, 16 inch/406.4mm – D cells and 24 inch/610mm – C cells)
- R. Analog clock receivers shall be as follows:
 - 1. Receiver sensitivity: >-110 dBm
 - 2. Receiver power: 120V power
 - 3. Antenna type: internal
 - 4. Antenna gain: -7 dBd
- S. If the transmitter stops transmitting valid time signals due to power failure, the clocks will continue to function as accurate quartz clocks until a valid time signal is decoded. If signal transmission is not restored after 48 hours, the second hand will “five step” as a visual indicator that the signal has been lost. Should the clocks lose power and signal, the clocks will not function.
- T. Traditional analog clocks (AC): Analog clocks shall be wall mounted. Clocks shall have polycarbonate frame and polycarbonate lens. Face shall be white. Hour and minute hands shall be black.
- U. Cable Connection Sealant: Radio Shack Coaxial Cable Connector Sealant 278-1645, or

approved electrical grade silicone sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that construction is complete in spaces to receive equipment and that rooms are clean and dry.
- B. Verify that 120 volt electrical outlet is located within 6 feet (1.83m) of location of transmitter and the outlet is operational and properly grounded.

3.2 INSTALLATION

- A. GPS Unit: Install on roof in location indicated, in clear view of the sky. Install unit in location free from standing water, and above accumulations of leaves or debris. Seal cable connection to GPS with cable connection sealant. Any added cable lengths must be protected from outside elements.
- B. Transmitter:
 - 1. Locate transmitter where indicated, a minimum of 2 to 3 feet (.6 to 1 meter) above the floor, away from large metal objects such as filing cabinets, lockers or metal framed walls. Transmitter(s) will be placed at locations per plans.
 - 2. Attach receiver to transmitter using cable.
 - 3. Connect antenna to transmitter, using care not to strip threads.
 - 4. Connect power supply to the transmitter.
- C. Set the channel number on the display to correspond to the FCC license.
- D. Plug power supply into electrical outlet.
- E. Analog clocks (120V): Perform the following operations with each clock:
 - 1. Set clock to correct time in accordance with manufacturer's instructions.
 - 2. Observe analog clock until valid signals are received and analog clock adjusts itself to correct time.
 - 3. Install the analog clock on the wall in the indicated location, plumb, level and tight against the wall. If using 12-1/2 inch (317.5mm) clock, attach using clock-lock hanging method and suitable fasteners as approved by clock manufacturer.

3.3 ADJUSTING

- A. Prior to final acceptance, inspect each clock, adjust as required, and replace parts which are found defective.

3.4 CLEANING

- A. Prior to final acceptance, clean exposed surfaces of clocks, using cleaning methods recommended by clock manufacturer. Remove temporary labels from clock faces. Do not remove labels from backs of clocks.

3.5 DEMONSTRATION

- A. Provide training to Owner's representative on setting and adjusting clocks, replacing batteries and routine maintenance.

3.6 PROTECTION

- A. Protect finished installation until final acceptance of the project.

3.7 TESTING

- A. All devices must be tested at their operational location under normal operational conditions to assure reception of signal.

END OF SECTION

SECTION 16820 - INTERCOM/SOUND

PART 1 - GENERAL

1.1 GENERAL

- A. Furnish and install a microprocessor controlled voice communication system with all conduit, wire, outlets and equipment as herein specified to provide a complete sound and voice communication system in the building(s). The main system is existing as indicated on the plans. Additional systems are to be provided and installed and be programmed and interfaced with the existing unit such that the system functions as a whole.
- B. All material and/or equipment necessary for the proper operation of the system, even though not specifically mentioned in the contract documents, shall be deemed part of this contract.
- C. All equipment shall be installed and connected in strict accordance with the manufacturers recommended instructions.
- D. Equipment shall be listed by Underwriter's Laboratories, Inc.
- E. All equipment shall be installed by a Factory Authorized Distributor of equipment specified herein. The installing contractor must have a minimum of five years experience in the specific application of the equipment proposed for this system. The owner shall be furnished with three brochures that provide written operating instructions for the system, wiring diagrams and maintenance notes. The system shall be guaranteed for a period of one year from date of final acceptance.
- F. Submit with quotation a copy of factory authorized franchise of the equipment proposed.
- G. The vendor shall show satisfactory evidence that he maintains a service organization capable of furnishing adequate service to the equipment provided and shall be prepared to offer a service contract for the service of the equipment after the guarantee period. Service shop shall be within one (1) hour driving time of the project site. Sub-letting of service shall disqualify vendor.
- H. The contractor shall have equipment installed on the AC voltage supply taking care to arrest damaging electrical transient and spikes which can cause damage to the microprocessor components of the system. Central office telephone lines shall have equipment installed to arrest high voltages from electrical and/or lightning from entering the system and causing damage. The system shall incorporate Transient Voltage Surge Suppression Technology at all input and output signal (data, voice, signal, etc.) terminations. For sites with multiple buildings, SPD devices shall be incorporated at the input and output terminations of each building.
- I. The specified equipment shall be supplied, installed, adjusted, tested and guaranteed by a factory authorized communications contractor for the products furnished. The vendor is responsible for verifying the completeness of the parts list and the suitability of the equipment to meet the intended purpose of the specifications and drawings.
- J. The vendor shall provide the following documentation and service:
 - 1. Shop Drawings. These drawings shall include the manufacturer's specification sheets, including all the component parts.
 - 2. As-Built Drawings. These drawings shall include the information above. They should include up-to-date drawings that include any changes made to the system during installation. Circuit diagrams and other information necessary for the proper operation and maintenance of the system shall be included.
 - 3. Operating Instructions: These instructions are to be permanently affixed to all administrative control stations.
 - 4. In Service Training: Provide the owner with a training program designed to make all administrative control stations users familiar with the operation of the voice communication system. A minimum of one (1) 4 hour session.
- K. The contractor shall warrant the equipment to be new and free from defects in material and

workmanship, and will within one year from the date of installation, repair or replace all or any part of the equipment found to be defective. This warranty shall not apply if damage is caused by abuse, accident, improper operation, or negligence. Warranty maintenance shall be provided by the contractor during his normal working hours at no expense to the owner.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. The system shall consist of a central equipment cabinet, microprocessor control unit, power supply, zone modules, administrative control centers (ACC's), amplifiers, remote display units, classroom loudspeaker assemblies, call-in switches, and all associated material, hardware, wiring, and options as described herein to provide a complete working system which shall meet the specified requirements:
 1. The system shall provide the following communication paths and functions:
 - a. ACC to a single classroom loudspeaker.
 - b. Administrative control center to administrative control center.
 - c. Simultaneous program distribution directed from any ACC without interrupting the intercom channel.
 - d. Remote cordless phone to a single classroom or to outside horns. The system shall be designed so as to accomplish any combination or all of the above functions simultaneously.
 2. The system shall provide the facilities for:
 - a. Paging
 - b. Sounding emergency signals
 - c. Timed event signals
 - d. Control and distribution of one program channel to individual classrooms, selected groups, or all classroom speakers.
 3. The system shall include the facilities for a master clock and programmer. The system master clock will be capable of correcting compatible brands of analog or digital or both types of secondary clocks.
 4. The system shall have an RS232 port for down load/up load capability. Provide owner with a diskette containing their bell schedule, architectural room number information, zone assignments for paging, and bell schedule. Information shall be loaded and unloaded from a standard P.C.
 5. Provide off-site diagnostic capability through RS232 port. Use of programming mode shall not inhibit system operation.

2.2 SYSTEM FUNCTION

- A. The system shall provide a minimum of two intercom channels.
- B. Provide microprocessor-based equipment of modular design, utilizing plug-In connections between all modules.
- C. Facilities to originate emergency calls which take precedence over all routine calls.
- D. System check with self diagnostics.
- E. System to support up to twelve ACC's each having identical functions and control features.
- F. Automatic gain control on intercom speech channel.
- G. Built-in battery backup for internal system clock to maintain correct time for a period of 7 days after power loss. All other programmed data shall be stored in non-volatile EEPROM memory

and will be retained indefinitely.

- H. Automatic pre-announce tone over any loudspeaker selected for two-way communications. A privacy tone will sound whenever a loudspeaker is being monitored.
- I. Distribution of paging announcements via any ACC.
- J. Classroom loudspeakers are user programmable to any of eight paging zones or class change zones.
- K. Unique system tones for emergency and civil emergency
- L. Special tone for custodial call to all speakers.
- M. Programmable tones such as warble, siren, chime, etc. six separate items available.
- N. Two way intercom communication from each speaker location.
- O. Last number redial.
- P. Speed dial access to specific remote stations.
- Q. Clear all calls registered on the ACC queue.
- R. Scroll waiting calls and select calls to be answered in any order.
- S. Call waiting indication: Steady display for normal calls; flashing display for emergency calls in order of priority.
- T. Call-in reminder in which unanswered calls will repeat until answered.
- U. LCD display for current call/calls waiting. Current time is displayed when the ACC is in an idle state.
- V. Provide one VOX handset (for private communications), built-in microphone, speaker, and push-to-talk button on each ACC for intercom communications.
- W. Sequential review of all incoming calls/calls waiting at each ACC with 100% call retention.
- X. Manual time tones which can be initiate by any ACC.
- Y. The system shall be zoned as follows:
 - 1. Each classroom shall be considered one zone and shall have a dedicated audio circuit to the central equipment cabinet.
 - 2. All corridor speakers will be on one zone.
 - 3. All outside horns will be on one zone.
- Z. Capability for any ACC to direct a program to any one, group of, or all remote stations.
- AA. Self diagnostics for each ACC.
- BB. Easy menu-driven programming
- CC. Programmable system functions, including:
 - 1. Five call-in priority levels.
 - 2. Two, Three, or four digit alphanumeric dialing.
 - 3. Twelve hour or twenty-four hour clock display when ACC is in the idle state.
 - 4. Two hundred and fifty -six events, eight time schedules, eight zones, and eight user-programmable tones.
- DD. Each classroom shall be programmed to annunciate at any one or all ACC'S.
- EE. Automatic distribution of user programmable time signals activated by an internal time clock.
- FF. Program room stations, zones, or multiple zones to receive the program source on a selected basis.

- GG. The system shall not require motor driven fans to keep system components cool.
- HH. Outside horns shall be activated for emergency announcements and tones only. Routine announcements and class change tones shall not go out over the outside horns.
- II. Simultaneous program distribution and two intercom channels.
- JJ. Compatible with remote display units for display of incoming calls and activity within the system.
- KK. System is to be compatible with a DTMF phone system and be able to use touch-tone phones to make and receive call from within the system.
- LL. System is to have a user-programmable, battery-backed master clock.
- MM. System is to be able to drive either digital or analog clocks or both from within the system.
- NN. System capacity shall be up to 256 remote stations and/or call points with up to twelve administration control units [ACC4's], up to 12 remote display units and unlimited interconnection to a phone system.
- OO. The system is to have user programmable input ports that allow external devices to trigger time and emergency tones, external all-call, door monitor, night transfer switch, and other system functions. User programmable dry contact outputs are provided to signal external devices when such functions as clock synchronization, all call, and remote annunciations occur.
- PP. System is to have PC connectivity.

2.3 SYSTEM MASTER CLOCK

- A. The system shall contain an integral master clock and programmer which shall be capable of performing the following functions:
1. Displaying the time of day in either twelve or twenty-four hour format at each Administrative Control.
 2. Providing 256 discrete time event entries for programming functions based on;
 - a. The time of day in hours and minutes:
 - The day or combination of seven {7} days of the week the event is to occur.
 - Selection of any one or any combination of eight {8} zones or outputs to be activated.
 - Selection of any one of eight schedules to allow for maximum flexibility due to special circumstances or seasonal changes. Selection of fourteen user programmable tones.
 3. Provide for an editing and review routine to permit the user to change and edit time events, zones, and schedules.

2.4 ADMINISTRATIVE CONTROL CENTER [ACC]

- A. The administrative control center shall be a Valcom VEAD4 or equal.

2.5 CENTRAL EQUIPMENT

- A. The central equipment shall be rack mounted in a standard cabinet. The central cabinet shall contain the following equipment:
1. Trunk or Digital card.
 2. Analog card.
 3. Zone switching card as required to accommodate system capacity.
 4. Power supply as required:
 5. System Amplifier(s) {125 watts minimum}
 6. The unit shall require 110 VAC power but in the event of a power failure, the system shall switch over to a standby battery backup system provided by this contractor.

7. New units shall interface with the existing unit and provide adequate number of zones to meet specifications plus 10% spare.
- B. Emergency Tone Generator:
 1. Provide seven distinct tones. Tones shall be activated by emergency push button panel specified below.
 - a. Emergency Tone shall go over outside horns.
 - b. Emergency tones shall be distributed to all speakers
 - c. Emergency tone generator included with the system.
- C. Communication Server - Provide intercom Communication/Notification Server equal to Valcom VE6090-1 IP6000.
- D. Zone Expander - Provide intercom Zone Expanders equal to Valcom VE8002BR.
- E. Talkback Gateway - Provide digital Talkback Gateways equal to Valcom VE1225 and/or VE8045 as required.

2.6 CALL-IN SWITCH

- A. The call-in switch shall be the Valcom V-2972, Dukane Model PCS499, Bogen CA-21 or Simplex 5120 9320 Call-In Switch with Privacy. The call-in switch shall use one, three-position rocker switch secured to a brushed stainless-steel wall plate for mounting to a standard single-gang electrical box. The switch shall provide for selecting privacy or normal operation in intercom-type sound systems. The switch shall have spring return closure in the CALL position for placing calls from a speaker location. The switch used shall provide momentary contact in the CALL position, maintained contact in the PVCY position. One button shall be capable of both normal and emergency call-in. A normal call-in becomes an emergency call-in when the CALL position is held and switch contact maintained for 3 seconds. External connections shall be to screw terminals. The switch shall bear PVCY and CALL designations in non-removable, hot-stamped lettering. The dimensions of the call-in switch shall not exceed 4-1/2 inches high, 2-3/4 inches wide and 1-3/16 inches deep.

2.7 WEATHERPROOF HORN

- A. The outside speaker shall be Valcom V-1030, Dukane Model 5A30, Bogen SPT-15-A or Simplex 5120-9583 Re-entrant type and shall be furnished and installed as indicated on the drawings. Each unit shall have a power rating of 15 watts full range. The frequency range shall be 275 to 14,000 Hz. The trumpet shall have a screwdriver adjustable switch that can be set externally to select 15, 8.0, 4.0, 2.0, 1.0 watts on a 70-volt line or 15, 13, 7.5, 7.0, 3.7, 2.0, 1.8, 1.0, 0.5 watts on a 25-volt line. Available impedances shall be 5000, 2500, 1250, 625, 325, 90 or 45 ohms. The sound pressure level shall be 121 dB at 4 feet on axis with 15 watts input and 110 degrees dispersion. The horn shall be 8" wide, 8" high, and 9" deep. It shall be fabricated from beige high impact ABS type plastic. External connections shall be screw terminals. The Terminal housing and transparent cover shall function together as a strain relief. The horn shall be provided with a three-way adjustable mounting bracket.

2.8 FLUSH CEILING LOUDSPEAKER SPEAKER ASSEMBLY

- A. The loudspeaker shall be Valcom VECTLA-2, Dukane Model 5A606, Bogen S86 or Simplex 5120-9481 furnished and installed as indicated on the plans. The loudspeaker shall be eight inch, seamless cone type. The ceramic magnet shall weigh at least 4.8 ounces. The frequency range shall be from 90 to 15,000 Hz. The normal wattage rating shall be 8 watts with a program rating of 12 watts. The voice coil diameter shall be 3/4" and the impedance 8 ohms.
- B. The overall speaker diameter shall be 8-1/32 inches, and the speaker depth shall be 2-3/4 inches. The weight shall be 1 pound, 14 ounces. All external parts shall be cadmium plated and conform to EIA standard. The loudspeaker shall be equipped with a universal matching transformer suitable for use on a 25-volt output line with taps at 1/2, 1 or 2 watts or a 70-volt output line with taps at 1/2, 1, 2 or 4 watts.

- C. The Flush Ceiling Baffles shall be Valcom, Dukane Model 6A338, Bogen WB8, or Simplex 5120-9421. The baffle shall be 12-5/8" in diameter, and the circular design shall match the surrounding motif. It shall be solid white, molded, high impact styrene, highly resistant to scratches and mars. The baffle finish shall accept any good latex paint to match the mounting surface where required. It shall mount an 8-inch loudspeaker with concealed screws and provide a 60% opening for the sound. The baffle weight shall not exceed 7.5 ounces.
- D. The Speaker Backbox shall be Valcom, Dukane Model 8A300, Bogen RE84, or Simplex 5120-9491. The enclosure shall have four 8-32 J nuts installed in the mounting flange. The backbox shall have four combination knockouts 1/2" – 3/4" spaced 90 degree apart. The backbox shall have a durable finish and shall use a Visco/elastic damping compound. It shall have a 9" diameter by 3/8" thick polyester urbane acoustic foam pad applied to the inside bottom to prevent mechanical and acoustical resonances.
- E. The Speaker Support Bridge shall be Valcom, Dukane Model 677-67, Bogen TB8, or Simplex 5120-9499. The speaker support bridge shall be made of steel and finished with a durable protective coating. The speaker support bridge shall be 14-1/2" high and 23-3/4" wide and weigh 1-1/2 pounds.

PART 3 - EXECUTION

3.1 CABLE

- A. Cable and wire as recommended by manufacturer.

END OF SECTION

SECTION 16950 - COMMUNICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The General and/or Special Conditions Sections are a part of this specification and the Contractor shall consult them in detail for instructions pertaining to this work.

1.2 SCOPE

- A. Furnishing of all labor, material, equipment, supplies, and services necessary to construct and install the complete communications systems as shown on the drawings and specified herein. Contractor shall report any discrepancies pertaining to this project scope between the plans given and the existing building. All work pertaining to cutover, removal of electronics and any other items indicated on plans shall be coordinated with Baldwin County Board of Education IT dept. Work shall include but is not necessarily limited to the following items:
 - 1. Data
 - 2. Telephone
- B. Contractor shall be solely responsible for quality control and shall maintain quality control over supervision, subcontractors, suppliers, manufacturers, products, services, workmanship, safety, temporary facilities, and site conditions, to produce Work in accordance with Contract Documents.
- C. Work shall be free from faults and defects in workmanship. Materials and equipment incorporated into the work shall be new, unless noted otherwise.
- D. Required testing and inspection are intended to assist in determination of probable compliance of the work with the Contract Documents, but do not relieve Contractor of responsibility for this compliance. Specified testing and inspection are not intended to limit Contractor's quality control program.

1.3 CONTRACTOR QUALIFICATIONS

- A. The Structured Cabling System Contractor (SCSC) shall be an experienced firm regularly engaged in the layout and installation of structured cabling systems of similar size and complexity as required for this installation. The Structured Cabling System Contractor, under the same company name, shall have successfully completed the layout, installation, testing and warranty of not less than five Structured Cabling Systems of the scope of the largest system on this project for a minimum period of three years prior to the bid date, and shall have been regularly engaged in the business of Structured Cabling Systems contracting continuously since. The Contractor shall have an existing permanent office located within 100 miles of the job site from which installation and warranty service operations will be performed.
- B. The contractor shall be a certified contractor by the structured cabling system (SCS) manufacturer and shall be in good standing. The contractor shall provide certificates of said certifications if required. In addition, the RCDD/ Project manager and not less than 50% of the installing technicians shall be BICSI certified installers and/or manufacturer certified. The contractor shall assure that all requirements of the warranty of this project can be met by the manufacturer and the contractors subsequent certification from the SCS manufacturer.
- C. The head Installer assigned for the project shall be a BICSI registered Level II installer.
- D. The Structured Cabling System Contractor shall present, with his signed contract, the name and certification number of a BICSI certified Registered Communications Distribution Designer (RCDD) who is a permanent employee of the Contractor. Contract RCDD's shall not be acceptable. The Contractor shall maintain this RCDD, or another RCDD approved by the Engineer, in his permanent employment throughout this project. The RCDD shall have overall responsibility for certifying that the installed structured cabling system conforms to these contract documents and to the referenced EIA/TIA, IEEE, BICSI, and UL standards. Specific requirements

for the RCDD are as follows:

- E. The RCDD shall be, in the judgment of the Engineer, thoroughly experienced in the design, layout, and installation of structured cabling systems of similar size and complexity as required for this installation. The RCDD shall submit evidence of these qualifications to the Engineer upon request.
- F. The RCDD shall affix his stamp to the Contractor's pre-installation submittal drawings, indicating that he has reviewed and approved the drawings for conformance to the contract documents and to the referenced codes and standards.
- G. The RCDD shall periodically visit the site and inspect the work in progress. RCDD site
- H. visits shall be made not less than once per month when the job is in active progress. The RCDD shall prepare a field report for each site visit for submission to the Engineer.
- I. The RCDD shall sign off on all copper and fiber optic cable test results, indicating that he was in responsible charge of all cable testing procedures and that all cables were tested in compliance with the contract documents and met or exceeded the requirements stated therein.
- J. The RCDD shall affix his stamp to the Contractor's as-built drawings, indicating that he has reviewed and approved the drawings as being complete, accurate, and representative of the system as actually installed.
- K. The RCDD shall be present for and participate in not less than four hours of user training.

1.4 CONTRACTOR QUALIFICATIONS – CONDUIT INSTALLATION

- A. All conduit shall be installed by a licensed electrical contractor using tradesmen who are skilled and experienced in the types of conduit installations indicated in the bid documents.

1.5 BID REQUIREMENTS

- A. The Structured Cabling System Contractor shall provide the following documentation, to be presented with the bid, as evidence that the requirements for Structured Cabling System Contractor qualifications listed above are satisfied. If the bidder does not meet the requirements of this specification section for structured cabling system work, he shall provide the following documentation, to be presented with the bid, as evidence that the requirements listed above are satisfied by the Structured Cabling System Contractor he proposes to use as a subcontractor to perform work under this section. In either case, all work under this section shall be performed by permanent employees of the Structured Cabling System Contractor listed on the bid form, and shall not be performed by another subcontractor, employees of another company, or by temporary employees.
- B. A list of not less than five (5) references for jobs of similar size and complexity including project name, location, contact person and phone number. These projects shall all be performed in K-12 schools while school was in session.
- C. RCDD name, BICSI certification number, and qualifications.
- D. Location of office from which installation and warranty work will be performed.

1.6 ADDITIONAL MATERIAL REQUIREMENTS

- A. In addition to the contract documents, the structured cabling contractor shall provide additional parts/materials for additional services and unforeseen conditions and additions. These additional materials shall include all labor to install and test per these specifications. These additional requirements shall include:
- B. 25 data cables and outlets ports, including faceplates, cable, patch panels (if needed) in locations to be determined under construction. Assume cables to be approximately 75' in length and terminated on nearest consolidation point or patch panel. These shall include all cable pathway requirements.
- C. Four installations of data surge protection (as specified on drawings), including grounding conductor and enclosure.

- D. These additional materials shall be used to replace existing damaged cables or newly added outlets. These items shall only be installed when approved by the Owner and engineer.
- E. Effort has been made to identify/locate all existing outlets on the drawings. It is anticipated that 10% of the outlets in the building have not been identified. Contractor shall locate these outlets when found and provide with new cabling, jacks, faceplates, labeling etc., and test as required by the plans and specifications. The quantity of additional, new outlets listed above are not included in these 10% of existing outlets that were not identified on the drawings.

1.7 RELATED REQUIREMENTS

- A. The contractor shall understand and apply the Baldwin County Board of Education telecommunications infrastructure standard to their installation. Any discrepancies between these specifications and the design drawings from these standards shall be noted and expressed to the Owner and engineer for a decision and direction.
- B. Division 16 Specification Sections regarding conduit and raceway apply to work under this section, with the additions and modifications specified herein and on the drawings. The special requirements indicated on the drawings for structured cabling system conduit shall take precedence over any requirements specified in Division 16 Specification Sections.

1.8 EXAMINATION OF SITES AND TOTAL SYSTEM RESPONSIBILITY

- A. Prior to providing a proposal for this work, the Contractor shall visit the proposed sites of work to become familiar with any condition that may in any manner affect the work to be performed. No allowances shall be made because of lack of knowledge of these conditions.
- B. The Contractor shall have total system responsibility to assure a fully operational system. Any additional labor and components required for the installation of a complete operating system but not specifically required by the bid documents shall be provided and the cost borne by the Contractor.
- C. The Contractor remains the owner of all components provided under this contract and is responsible for all risk of loss or damage to all components up to and including the date and time of Final Acceptance by the Engineer and the Owner's Authorized Representative. After the date of Final Acceptance, the Owner shall assume full ownership of the equipment.

1.9 JOB CONDITIONS

- A. Existing Conditions: All existing systems, and conditions shown on the plans as existing are approximate, and the Contractor shall verify all details of the project before any work is started.
- B. Scheduled Interruptions: Planned interruptions of telephone/data/, to any facility affected by this contract, shall be carefully coordinated and approved by the Architect at least ten (10) days in advance of the requested interruption. The Contractor shall not interrupt services until specific approval has been granted by the Architect. The request shall indicate services to be affected, date and time of interruption and duration of outage. Request for interruption of service will not be approved until all equipment and material required for the completion of that particular phase of work are on the job site. The work may have to be scheduled after normal working hours.
- C. Maintaining Service: Any existing service (or operating system) which must be interrupted for any length of time shall be supplied with a temporary service as necessary for continuation of the normal operation of this facility.
- D. Removal of Existing Work: Where noted or indicated on the drawings, or specified herein, existing electrical materials and equipment shall be removed from the building. All materials designated to be removed by the Contractor, not to be salvaged and given to the Owner or required to be reinstalled, including scrap, shall become the property of the Contractor, and shall be promptly removed from the site. Existing items required to be removed temporarily in order to properly install new work shall be replaced in a satisfactory manner upon completion.

1.10 CODES, PERMITS AND INSPECTIONS

- A. Minimally, the following standards must be met when applicable to the work performed:

1. International Standards Organization/International Electrotechnical Commission (ISO/IEC) DIS 11801
 2. Underwriters Laboratories (UL) Cable Certification and Follow up Program.
 3. ANSI/TIA/EIA-568-B.1 -- Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements
 4. ANSI/TIA/EIA-568-B.2-1 -- Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components
 5. ANSI/TIA/EIA-568-B.3 -- Optical Fiber Cabling Components Standard
 6. ANSI/TIA/EIA-569-A -- Commercial Building Standard for Telecommunications Pathways and Spaces
 7. ANSI/TIA/EIA-606(A) -- The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 8. ANSI/TIA/EIA-607(A) -- Commercial Building Grounding and Bonding Requirements for Telecommunications
 9. ANSI/TIA/EIA-526-7 -- Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant
 10. ANSI/TIA/EIA-526-14A -- Measurement of Optical Power Loss of Installed Single mode Fiber Cable Plant
 11. ANSI/TIA/EIA-758(A) -- Customer-Owned Outside Plant Telecommunications Cabling Standard
 12. AHJ -- Local Authority Having Jurisdiction (AHJ)
 13. NEC -- National Electrical code
 14. NFPA -- National Fire Protection Association
 15. NESC -- National Electrical Safety Code
 16. BICSI -- BICSI Telecommunications Distribution Methods Manual (TDMM)
- B. The installation shall comply with all local, state, and federal laws and ordinances applicable to communication equipment installation and with the regulations of the latest published edition of the National Electrical Code (N.E.C.) and the Federal Communications Commission (FCC) where such regulations do not conflict with those laws and ordinances. The Contractor shall obtain and pay for all permits and inspection fees, and after completion of the work, shall furnish the Architect a certificate of final inspection and compliance with the standards listed above as applicable. Any charges by a utility (Data, Telephone, etc.) for providing service as shown shall be included in the bid and paid by the Contractor.

1.11 JOB-SITE CONDITIONS

- A. The Contractor shall be required to coordinate working hours at each site with the School Principal. Work at the site shall not be allowed during hours when school is in session, unless specifically approved by the School Principal on a day-by-day and case-by-case basis. The Contractor shall work at night and/or weekends (or at any time school is not in session) to meet these requirements at no additional charge to the Owner.
- B. The Contractor shall be responsible for ensuring that his employees and any subcontractors:
- C. Refrain from smoking or the use of tobacco in any facility, property or vehicles owned by the School District. Any person wishing to use tobacco products must leave School District property to do so.
- D. Refrain from the use of vulgarities while on School District property.
- E. Wear proper attire to include full length pants or jeans and appropriate shirts. Clothing shall have no vulgarities or sexually suggestive graphics. Clothing shall bear contractor's company name.

- F. Refrain from contact with students or staff. Communications with staff shall be limited to that related to the work.
- G. The School District retains the right to require the Contractor to dismiss any employee or any employee of his subcontractors deemed incompetent, careless, insubordinate or otherwise objectionable, or any personnel whose actions are deemed to be contrary to the public interest or inconsistent with the best interest of the School District.
- H. The Contractor shall be responsible for all damages to any building, equipment, furnishings, or other property of the School District that are caused by the Contractor or his subcontractors. The Contractor shall, as directed by the Engineer or the Owner's Authorized Representative, repair or replace any damaged item at the Contractor's expense. Any item which the Engineer or the Owner's Authorized Representative allow to be repaired shall be restored to the condition which existed prior to the damage occurring, or better.

1.12 PRE-INSTALLATION WALK-THRU

- A. Contractor shall schedule a walk-thru with principal and school district IT representative. The purpose of the walk-thru will be to identify any damage that exists prior to installation and potential conflicts/discrepancies with the design documents. All issues shall be documented and signed off by the principal and school district IT representative.

1.13 PRE-CONSTRUCTION CONFERENCE

- A. Contractor shall schedule a pre-construction conference with principal, school district IT representative and engineer. Contractor shall present any issues/discrepancies from pre-installation walk-thru, schedule of construction including start date and completion date, scheduled progress meetings, anticipated daily work schedule and any required scheduling with principal, school IT representative and engineer.

1.14 DRAWINGS AND SPECIFICATIONS

- A. The drawings and these specifications are complimentary each to the other. What is called for by one shall be as binding as if called for by both. Where the drawings and/or specifications differ as to quantity or quality, the greater quantity or higher quality shall be provided. Omissions from the drawings and specifications of details of work which are evidently necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such work. In any case of discrepancy in the figures or catalog numbers, the matter shall be submitted to the Architect, who shall promptly make a determination in writing. Any adjustment by the Contractor shall be at the Contractor's own risk and expense. Electrical drawings are diagrammatic only. Do not scale these drawings. All equipment shall be installed in accordance with manufacturer's recommendations and any conflicting data shall be verified before bidding.

1.15 STANDARDS OF MATERIALS AND WORKMANSHIP

- A. Materials: All materials shall be new and shall be listed and approved by the Underwriters' Laboratories, Inc., in every case where a standard has been established for a particular type of material in question. All work shall be executed in a workmanlike manner and shall present a neat appearance.
- B. Prior Approvals: Equipment and materials of the same type or classification and used for the same purpose, shall be products of the same manufacturer. It is the intention of these specifications to indicate a standard of performance and quality for all materials incorporated in this work. Manufacturer's names and catalog numbers are used to designate the item of equipment or material as a means of establishing grade and quality. Where several manufacturers are named, only those named manufacturers' products will be considered and the Contractor's bid shall be on their products. The first named of several manufacturers is the manufacturer whose product was used in engineering the project. Other named manufacturers, although acceptable as manufacturers, shall guarantee that their product will perform as specified and will meet space requirements. Where performance characteristics of such equipment differs from the equipment scheduled on the drawings, the engineer shall reserve the right to reject it.

- C. For approval of products other than those specified, bidders shall submit to the Architect, a request in writing, at least ten (10) days prior to bid date. Requests received after this time will not be reviewed or considered regardless of cause. Requests shall clearly define and describe the product for which approval is requested. Requests shall be accompanied by manufacturer's literature, specifications, drawings, cuts, performance data, model numbers, list of references or other information necessary to completely describe the item. Approval will be in the form of an Addendum to the specifications issued to all prospective Prime Contract Bidders on record. The Addendum will indicate the additional products which are approved for this project.
- D. Substitutions: Reference to a particular product by manufacturer, trade name, or catalog number establishes the quality standards of material and equipment required for this installation and is not intended to exclude products equal in quality and similar design. The Architect reserves the sole right to decide the equality of materials proposed for use in lieu of these specified. It shall be the Contractor's responsibility to furnish the information and data sufficient to establish the quality and utility of the items in question, including furnishing samples if required.
- E. Shop Drawings: The Contractor shall submit a list of items proposed for use. He shall also submit catalog data and shop drawings on proposed systems and their components, panelboards, safety switches, starters and contactors, transformers, lighting fixtures, and wiring devices. Where substitutions alter the design or space requirements, the Contractor shall defray all items of cost for the revised design and construction including costs to all allied trades involved. Data shall be submitted within ten (10) calendar days after the contract is awarded. Provide six (6) copies of shop drawings unless a greater number of copies is required by the General Conditions. Each submittal data section shall be covered with an index sheet listing Contractor, Sub-Contractor, Project Name, and an index to the enclosed submittals.
- F. Each major section of submittals such as power, equipment, lighting equipment, fire alarm, etc., shall be secured in a booklet or stapled with a covering index which lists the following information:
 - 1. General contractor with phone number and project manager.
 - 2. Subcontractor with phone number and project manager.
 - 3. Supplier of equipment with phone number and person responsible for this project.
 - 4. Index of each item covered in submittal and model number as proposed in the attached.
- G. Any deviation from contract documents shall be specifically noted on submittal cover index and boldly on specific submittal sheet.
- H. Operating and Maintenance Manuals: At completion of the work, furnish three (3) copies of written operation instructions which shall include manufacturer's descriptive bulletins, operating and maintenance manuals and parts lists of all equipment installed. Also include in such instructions, the specified size and capacity ratings of all equipment installed. Each set of instructions shall be assembled into a suitable loose-leaf type binder and presented to the Architect for delivery to the Owner.
- I. Record Drawings: Maintain one extra set of black-line, white print drawings for use as Record drawings. Records shall be kept daily, using colored pencil. As the work is completed, relevant information shall be transferred to a reproducible set, and copies made to be given to the Architect.

1.16 INTERFACE WITH OTHER CONTRACTS

- A. It shall be the responsibility of the Contractor to cooperate with all other crafts working on this project. All cutting, trenching, backfill, and structural removals to permit entry of the communications system components shall be done by this Contractor. All patching and finishing shall be done by the General Contractor.

1.17 GROUNDING

- A. Provide grounding and bonding systems in strict accordance with the latest published edition of N.E.C., except where more stringent requirements are specified herein. Inter-connection of neutral and ground is not permitted at any point in the communications system. Install grounding

conductors to permit shortest and most direct path to ground. Inaccessible joints are not to be made in grounding conductors. Where grounding conductors are in raceway, bond conductor and raceway at both ends. Grounding and bonding fittings used shall be UL listed and be compatible with metals used in system. Sheet metal type straps are not acceptable.

- B. The Equipment Rack shall be connected to the existing ground system that consists of driven electrodes, ground ring, building steel, water pipe electrodes, concrete encased electrode, rod and pipe electrodes, or plate electrodes by a #3/0 conductor. The driven electrodes, building steel, water pipe electrodes, and concrete encased electrodes are the minimum requirements. Extend grounding conductor to main telephone equipment space.
- C. The Contractor shall test and provide written certification of final ground system; including test method, equipment model and serial numbers, and final measurements at each point. The ground electrode system must be less than 25 ohms.

1.18 GUARANTEE AND SERVICE

- A. Upon completion of all tests and acceptance, the Contractor shall furnish the Owner of a written guarantee covering the electrical work done for a period of one (1) year from date of acceptance. Guarantee includes equipment capacity and performance ratings specified without excessive noise levels. Upon notice from the Architect or the Owner, the Contractor shall, during the guarantee period, rectify and replace any defective material or workmanship and repair any damage caused thereby without additional cost.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All equipment and materials shall have ratings established by the recognized independent agency or laboratory. The Contractor shall apply the items used on the project within the ratings and subject to any stipulations or exceptions established by the independent agency or laboratory. Use of equipment or materials in applications beyond that certified by the agency or beyond that recommended by the manufacturer shall be cause for removal and replacement of such misapplied items. See section 16100 for raceway and junction/pull box requirements.

2.2 CABLES

- A. Data/Communication Cable: Cable shall be Category 6 unshielded twisted pair. The vendor shall determine if plenum or riser rated cable is required for the specific installation.
- B. Cable Pathway: Extension of all data cables shall be within raceway, conduit, cable tray or j-hook cable delivery system provided and installed by the contractor.
- C. Fiber: Fiber shall be 6 strand count single mode fiber optic cable. Cabling will have a 15 year manufacturers warranty on all parts and labor.
- D. All copper cable terminations shall comply with, and be tested to TIA/EIA 568B and TSB-67 standards for Category 6 installations.
- E. All test results shall be compiled and given to the Owner in electronic format.
- F. Cables to be provided by the Contractor:
 - 1. One 6' patch cord with terminations per data connection point.
 - 2. One 6' telephone cable with terminations per telephone connection point.
 - 3. RCA outlet connection cabling as shown on the plans.
 - 4. Cat-6 cabling and labeled terminations from the Data Equipment Rack to all data connection points.
 - 5. Cat-6 cabling and labeled terminations from the Telephone Equipment Rack to all Telephone connection points.
- G. All cables and labeled terminations required in the MDF/IDF's to interconnect patch panels, data

equipment, fiber optic patch panels, Telephone distribution hub, computers, etc. to provide a fully functional and operational system.

- H. Cables and labeled terminations between all Main Distribution Frames (MDF's) and Intermediate Distribution Frames (IDF's) (existing and new), and between all Cable TV and Telephone distribution backboards/network centers.

2.3 CABLE ROUTING

- A. Cabling: All communications cabling used shall comply with the requirements as outlined in the National Electric Code (NEC) article 760 and the appropriate local codes. All cabling shall bear CMP (Plenum Rated), CM/CMR (Riser Rated) markings. All cabling shall be solid copper, 24 AWG, 100 W balanced twisted-pair (UTP) Category 6 cables with four individually twisted pairs, which meet or exceed the mechanical and transmission performance specifications in ANSI/TIA/EIA-568-B.2-1 up to 1 GHz.
- B. Cabling Bundling: Install horizontal cabling shown to be free-routed parallel and perpendicular to building lines, up high and over piping, ductwork, conduit and other utilities, and in protected locations. All cabling shall be neatly and symmetrically bundled (maximum individual bundle size 25 four pair Category 6 cables), bound with black velcro wraps at a minimum of four feet on center, properly supported, and otherwise installed as indicated on the drawings. Support all free-routed horizontal cabling bundles individually with Category 6 J-hooks (Erico "CABLCAT") at a minimum of four feet on center. Attach J-hooks to building structural members only using factory support system components. Secure cables bundles within J-hooks with factory contact free containment cable ties. Do not attach J-hooks to ceiling grids, ceiling supports, piping, ductwork, conduit or anything other than building structural members unless specifically approved by the Engineer. Do not support free-routed horizontal cabling by running over or directly attaching to building structural members, piping, ductwork, conduit or any other utility.
- C. Do not pull cables in conduits until plastic insulating bushings have been installed. Cables installed in conduits without plastic insulating bushings shall be removed and replaced with new cables. Route conduits together wherever possible.
- D. Provide wire management devices on backboards and racks as indicated and as required to facilitate organized routing of cables and patch cords. Bundle cables together behind racks and fan out to points of termination. The finished installation shall meet the approval of the Engineer for overall quality and neatness of appearance.
- E. The Contractor, in providing a bid, shall be fully responsible for any and all damage to cabling which may occur during the installation, and shall replace any damaged cabling with new cabling of the type specified for the application.
- F. Fire Stopping: Sealing of openings between floors, through rated fire and smoke walls, existing or created by the contractor for cable pass through shall be the responsibility of the contractor. Sealing material and application of this material shall be accomplished in such a manner, which is acceptable to the local fire and building authorities having jurisdiction over this work.
- G. Warning Labels: All fiber optic cable running through crawl spaces, in attics, or above drop ceilings shall be clearly and noticeably marked as fiber optic cable, unless completely covered and protected in conduit. Warning markings must be placed at a minimum of every five (5) feet.

2.4 STRUCTURED CABLING SYSTEM

- A. All drops installed and maintained by vendor must support (but not be limited to) the following application standards: 100Base-T (IEEE 802.3), 1000Base-T (Fast Ethernet), 100VG - AnyLAN (IEEE 802.12), 4/16 Mbps Token Ring (IEEE 802.5), and 52/155Mbps ATM (ATM Forum).

2.5 SYSTEM DESCRIPTION

- A. The system work or projects shall consist of a network of fiber optic, and unshielded twisted pair, riser, tie, patch, and station cables. Cables and terminations shall be provided and located as shown and in the quantities indicated on any drawings, or determined during school walk through. Fiber cables shall terminate on fiber distribution centers (FDC's), fiber patch panels (FPP's), lightguide interconnect unit (LIU's), and/or modular patch panels located in all designated

demarcation points. All cables and terminations shall be identified at all locations. All cables shall be terminated in alphanumeric sequence at all termination locations. All copper cable terminations shall comply with, and be tested to TIA/EIA 568B and TSB-67 standards for Category 6 installations. Station cables shall terminate on wall plates equipped as designated by Baldwin County Board of Education (BCBE) personnel.

- B. Outlets: Outlets for data communication shall consist of two gang utility outlet boxes. Wall plates will be equipped with 8-pin modular (RJ-45) jacks, utilizing T568B wiring. Single-gang mounting plates may have one, two, three, or four openings. The following are the specifications for each type of opening:
 - C. Voice Outlet - AMP, Ortronics, or Hitachi 8-pin modular, category 3, unkeyed, black, pinned to T568B Standard.
 - D. Data Outlet - AMP, Ortronics, or Hitachi 8-pin modular, category 6, unkeyed, orange, pinned to T568B Standard.
 - E. Optical Fiber Connectors - E ST adapter.
- F. All wall boxes, faceplates, track, and all other associated pieces shall be the color of white. Each port shall be clearly marked what type of port it is and the number in which that port associates to in the termination point. All outlet cabling shall terminate on termination patch panels in their associated TC or WC.
- G. Station Cable: Category 6 UTP, 4 Pair, data cables shall be extended between the station location and its associated TC or WC. These cables shall consist of 4 pair, 24 gauge, UTP, and shall be terminated on the 8-pin modular jacks provided at each outlet. Cable jacket shall comply with Article 800 NEC for use as a plenum cable. The 4 pair UTP cable shall be UL certified.
- H. Fiber Optic Cabling: Fiber optic cabling shall be provided between MDFs and classrooms, libraries, and other rooms and furnished with the quantity of fibers designated by Baldwin County Board of Education.
- I. Same Manufacturer: All fiber in a cable run shall be from the same manufacturer and shall be of the same type. A mix of fibers from different manufacturers may not be used without BCBE permission.
 - 1. Single mode Fiber Specifications: All fiber optic cables within the premises will use single mode, graded index, fibers with 9 micron cores only. Fibers must comply with EIA/TIA 492 specifications and IS 11801 standards. Fibers will have dual-wavelength capability: transmitting at 850nm and 1300nm ranges. All fibers shall be color coded to facilitate individual fiber identification.
 - 2. Fan-out Kits: All loose tube cables will be provided with fan-out kits at each termination point.
- J. Equipment Racks: The TC, TWC, or ER shall be equipped with a floor mounted EIA/TIA standard 19" rack as designated. Provide shelves and wire managers as required by Baldwin County Board of Education. Racks shall be manufactured by Ortronics or approved equal. Provide and install all wire management hardware. Rack wire management is to be vertical and mounted on the sides.
- K. The minimum rack size shall be a standard 19 inch rack with sufficient rack space to allow the fiber distribution center (FDC) to be placed at the top of the rack.
 - 1. Floor mounted racks shall be secured from the top rail to the backboard in the room with a length of cable runway to prevent movement. All racks shall be grounded to the isolated ground bar within the ER using a standard ground lug and #6 jacketed green cable.
- L. Patch Panels: Patch panels shall be in 12, 24, 48, and 96 port configurations as designated and be AMP, Ortronics or Hitachi. Patch panels shall be wired for T568B configuration.
 - 1. Designation strips for each jack shall be provided on the patch panel. All cables shall be terminated in numerical sequence.
- M. Category 6 Patch Cords: Provide Category 6 Modular Patch Cords for each assigned port on the

patch panel. All cords shall conform to the requirements of EIA/TIA 568B Commercial Building Telecommunications Cabling Standard and be part of the UL LAN Certification Follow-up Program. Cords shall be equipped with an eight (8) pin modular connector on each end and shall conform to the length(s) required maintain proper installation and bend radiuses.

- N. Fiber Patch Panels: Lightguide Interconnect Unit (LIU): LIU is a termination and administration point for the fiber in the network. The LIU will protect the fiber connectors from mechanical stress, macro-bending, and tampering with the circuit. The LIU will provide circuit identification and will be wall-mounted. The LIU shall be manufactured by Siecor and have connector panels that accommodate ST connectors. The LIU shall provide terminating, cross-connecting or interconnecting capability of 6, 12, or 24 fibers.
- O. Fiber Patch Panels: Lightguide Distribution Shelves (LDS): LDS is a high fiber-count termination and administration point for the fiber cables in the network. The LDS will provide a place for circuit identification and be mounted securely at the top of the equipment rack. LDS shall be manufactured by Siecor or approved equal. The LDS shall have connector panels that accommodate ST connectors. The LDS must be mountable in a 19" rack and have front and rear access panels. The LDS shall provide terminating capability of 24, 48, 72, or 144 fibers.
- P. Fiber Patch Cords: The fiber patch cords shall consist of a buffered, graded index fiber with 9 micron core and a 125 micron cladding for single mode application. The fiber buffer shall be covered by aramid yarn and have a jacket of flame retardant PVC. The connector shall be ST as manufactured by Siecor or approved equal.
- Q. Single mode Fiber Optic Connector: Provide a field installable single mode connector to terminate fiber optic cables from cable-to-cable, cable-to-equipment or equipment-to-equipment, and make jumpers. The connector must be AMP light crimp, ST, stainless steel.

2.6 CABLE LADDER

- A. The cable ladder is to be as indicated on the plans with heavy-duty 3/8" steel bar construction. Channel cross slats are to be welded between stringers. Provide and install all associated support hardware, transitions, curves. See the plans for the actual size of the ladder.
- B. A CSD Firststop firestop system is to be provided and installed where fire barriers are penetrated by cable ladders.

2.7 IDENTIFICATION

- A. All labels shall be produced using a laser printer and shall be easily readable from floor level when viewing a backboard, panel, or communications outlet from the front.
- B. Labels for communications outlets, horizontal patch panels, and fiber optic drawers shall be made using factory laser printer label sheets furnished by the outlet and block manufacturer. Sheets shall be preformatted with perforated tear-out labels sized for the specific application. Use spreadsheets furnished by the manufacturer to enter data for printing. Handwritten labels are not acceptable. Provide data sheets describing proposed labeling products for cable and conduit with pre-installation submittals.
- C. Label each main cable at each end based on source and destination room numbers using Engineer approved permanent labeling system.
- D. Label each horizontal wiring conduit at the backboard or panel end based on the identification of the CO served using Engineer approved permanent labeling system.
- E. Label each main (backbone) cable at each end based on source telcom room number and destination telcom room number using write-on mylar wrap wire markers.
- F. Label each existing communications outlet to match new labeling scheme as shown on the plans.
- G. Label each communications outlet, horizontal wiring terminal block, backbone wiring terminal block, communications panel, rack, enclosure, and other devices as indicated on the drawings.

2.8 CABLE TESTING

- A. Prior to the installation of patch cords, the Contractor shall test all cables. As part of cable test

procedures verify all labeling and correct all inaccurate labeling. Cable testing shall include existing outlets/cables, TC's and new outlets/cables.

- B. The Contractor's RCDD shall be in responsible charge of all cable testing procedures and shall provide a letter to the Engineer at the completion of successful testing certifying that all cables have been tested in compliance with the contract documents and have met or exceeded the requirements stated therein.
- C. The requirement for this project is full compliance/zero tolerance. Cables which do not comply shall be removed and replaced. If certain existing cables do not comply, contractor shall notify engineer and may be deemed (at engineer's discretion) considered part of contractor's required "Additional Materials Requirement" in the specifications and be replaced with new. Partial use of cables by claiming good pairs or strands and abandoning others is not allowable. Defective cables shall be removed.
- D. Tests shall be performed in strict accordance with the test instrument manufacturer's printed instructions.
- E. Technicians performing testing shall be thoroughly trained in the use of the test instruments employed. Factory certification of technicians is desirable. The Contractor shall provide evidence of training if requested by the Engineer.
- F. Test instruments shall be calibrated and traceable to the National Institute of Standards (NIST). Test instruments shall have been recently calibrated. The Contractor shall provide evidence of test instrument calibration if requested by the Engineer.
- G. The Contractor shall be required to retest installed cables in the Engineer's presence to verify the Contractor's test documentation. The percentage of cables to be retested shall be determined by the Engineer based on compliance of the installation with the contract documents, quality of workmanship, and results of initial cable tests. Retesting shall be performed as required until all cables, in the judgment of the Engineer, comply with the requirements of the contract documents.
- H. Cable Test Manual: Prior to the Substantial Completion Inspection, complete the digital (CD/DVD format) Cable Test Manual. Submit the Cable Test Manual to the Engineer at the Substantial Completion Inspection. Provide transmittal letter addressed to the Engineer indicating that the Contractor is providing one CD/DVD disk containing cable test results.
 - 1. Quantity: One (1).
 - 2. Format: CD/DVD disk with printed label indicating the following:
 - a. Project Name
 - b. Contractor's Name
 - c. Owner's Name
 - d. Owner's Project Number or Purchase Order Number
 - 3. CD/DVD Contents: RCDD Certification (PDF format):
 - a. Written Certification of Contractor's RCDD, digitally signed, stating that all fiber optic, Category 6, and multi-pair telephone cables have been tested in compliance with the contract documents and have met or exceeded the requirements stated therein.
 - b. Test Reports: Test reports of all fiber and copper cabling. Provide with software compatible reader, similar to Fluke Networks LinkWare. Refer to test requirements in this section.
 - Fiber Optic Cable Testing:
 - 1) Fiber optic cable shall be tested with an OTDR tester.
 - 2) Notify the Engineer in writing not less than five days prior to commencing fiber optic cable testing. The Engineer may elect to be present for and witness fiber optic cable testing.

- 3) Clean all fiber optic connectors, sleeves and test cords prior to testing. Follow all other recommendations of the test instrument manufacturer for cable and instrument preparation.
 - 4) Record all test conditions and setup parameters and include in a typed discussion to be provided with test documentation. Setup parameters shall include the length of the fiber launch cord.
 - 5) All fiber optic cable tests shall be performed with a section of launch cord of known length preceding the FUT (fiber under test) and with a section of cord following the FUT. The trace for each test shall clearly display the two-point loss in db, which shall include the loss of the FUT and both mated connectors of the FUT. The operator shall carefully position the first cursor just ahead of the first mated connector of the FUT, and the second cursor just behind the second mated connector of the FUT.
- Post-Installation Testing: After installation and termination of fiber optic cable, test each strand of fiber to verify that the installed cable meets the performance requirements described below. Each strand shall be tested at both the 850nm and 1300nm wavelengths. Provide a printout of the trace for each test to the Engineer for review and approval.
 - 1) Documentation: Test documentation for fiber optic cabling shall include the following:
 - a) A digitally signed PDF document from the Contractor's RCDD certifying that all cables have been tested in compliance with the contract documents and have met or exceeded the requirements stated therein.
 - b) An introductory discussion documenting test instruments used, qualifications of operators, test conditions, setup parameters, length of the fiber launch cord, and any other pertinent information.
 - c) A full size full page of the OTDR trace for each strand at 850nm and 1300nm wavelengths. Each strand shall be clearly identified using the labeling nomenclature described on the drawings. Each trace shall clearly indicate the name of the operator who performed the test, and the date of the test.
 - d) Insert all fiber optic cable test documentation in the Cable Test Manual.
 - Fiber Optic Cable Performance Requirements: Each strand of the installed fiber optic cabling, with mated connectors at each end, shall have a total power loss (in db) less than or equal to the manufacturers' performance specifications for the cable and connectors called for in the contract documents, when adjusted for the installed length, and with an allowable deviation of 1.0 db. If the test results for a given strand or strands, in the judgement of the Engineer, indicate excessive power loss, the Contractor shall repolish, reconnectorize, or replace the affected cables as required to achieve specified performance levels as demonstrated by retesting.
 - Category 6 UTP Cable Testing:
 - 1) Category 6 cable shall be tested with a Level II tester.
 - 2) Notify the Engineer in writing not less than five days prior to commencing Category 6 UTP cable testing. The Engineer may elect to be present for and witness cable testing.
 - 3) Record all test conditions and setup parameters and include in a typed discussion to be provided with test documentation.
 - Post-Installation Testing: After installation and termination of the Category 6 UTP cable, test each cable in accordance with TIA/EIA test specifications. Test each cable from both ends with a Category 6 tester, Fluke DSP 4000 series or approved equal, to verify compliance with TIA/EIA specifications for Category 6 UTP, "Basic Link"

configuration, Level II accuracy, with no allowable deviation. Test at the full range of frequencies indicated by TIA/EIA up to and including 100 MHz. Use the tester to measure near-end crosstalk (NEXT) and attenuation-to-crosstalk (ACR) from both ends of each cable. Make connections at each end using access cables provided by the tester manufacturer.

1) Documentation:

- a) Test documentation for Category 6 cabling shall include the following:
- b) A letter from the Contractor's RCDD certifying that all cables have been tested in compliance with the contract documents and have met or exceeded the requirements stated therein.
- c) An introductory discussion documenting test instruments used, qualifications of operators, test conditions, setup parameters, and any other pertinent information.
- d) One copy of a full page hardcopy printout for each cable test using the tester manufacturer's standard "Cable Certification Report - CAT6 Link Autotest". Each report shall include the NEXT and ACR results for each pair combination from both ends of each cable. Each cable shall be clearly identified using the labeling nomenclature described on the drawings. Each report shall clearly indicate the name of the operator who performed the test, and the date of the test.
- e) Insert all Category 6 cable test documentation in the Cable Test Manual.

- Category 6 Cable Performance Requirements: If the test results for a given cable or cables, in the judgment of the Engineer, fail to confirm acceptable performance, the Contractor shall reconnectorize or replace the affected cables as required to achieve specified performance levels as demonstrated by retesting.

2.9 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protections: Take necessary precautions to protect all material, equipment, apparatus, and work from damage. Failure to do so to the satisfaction of the Architect will be sufficient cause for the rejection of the material, equipment, or work in question. Contractor is responsible for the safety and good condition of the materials installed until final acceptance by the Owner
- B. Cleaning: Conduit openings shall be capped or plugged during installation. Fixtures and equipment shall be tightly covered and protected against dirt, moisture, chemical, and mechanical injury. At the completion of the work, the fixtures, material and equipment shall be thoroughly cleaned and delivered in condition satisfactory to the Architect.

PART 3 - EXECUTION

3.1 CLEANING UP

- A. Prior to the Substantial Completion Inspection, perform final cleanup of all work and all areas in which work was performed. All work areas shall be left vacuum clean. All raceway, faceplates, jack assemblies, racks, panels, data hub equipment, and the like shall be wiped down to remove dust accumulated during the course of the project. All painted surfaces such as backboards shall be touched up with paint to remove scuff marks, pencil marks, scratches, etc. All factory surfaces shall be touched with matching paint.

3.2 SUBSTANTIAL COMPLETION

- A. After Final Checkout of system operation, and with the Final Checklist, Final Compliance Cable Test Results CD/DVD disk, and the O&M Manuals in hand, the Contractor shall notify the Architect/Engineer in writing and with a completed copy of the Final Checklist. The Contractor's project manager and project senior technician shall be present for the Substantial Completion Inspection.

3.3 CORRECTIVE ACTION

- A. The contractor shall correct any and all deficiencies listed for completion or correction within a reasonable amount of time after deficiency is noted.
- B. If, in the opinion of Owner, Architect, or Engineer (A/E), the Contractor fails to correct any items to the A/E's satisfaction after sufficient corrective action has been attempted by the contractor, then the A/E shall have the right, after forty-eight (48) hours written notice, to employ such workmen to complete the requirements of this project, who will perform work as required to the satisfaction of the A/E, and the cost to complete the Work shall be charged to Contractor.

3.4 OWNER PERSONNEL TRAINING

- A. Subsequent to Substantial Completion but prior to Final Completion, the Contractor shall provide on-site training to Owner personnel on the operational use of the features of the system and the use of all equipment provided. The cost of training shall be included in the cost of the system.
- B. The Engineer shall be notified prior to training and may participate in training at their discretion.
- C. The instruction shall be presented in an organized and professional manner by personnel who are thoroughly familiar with the structured cabling system in the existing facility. Training shall include a "walk-through" of the systems to identify and locate closets, panels, and important system components, a discussion of overall system concepts and configuration, specific instruction in labeling and patch cord move/changes, a review of the as-built drawings, a review of the system verification and acceptance documentation, and guidelines for basic troubleshooting and operation of the structured cabling system and data hub equipment.
- D. The Contractor shall provide documentation of training (including names of personnel present at each training session) to the Engineer at the Final Completion Inspection. The documentation shall be signed-off by the Owner. The documentation shall be three-hole punched and ready for insertion in the O&M manuals.

3.5 FINAL COMPLETION

- A. Following completion of punch list items generated by the Architect/Engineer as a result of the Substantial Completion Inspection, the Contractor shall notify the architect/Engineer in writing, stating that all punch list items have been completed.

3.6 WARRANTY AND MAINTENANCE

- A. Contractor warrants all work performed by him directly and all work performed for him by others. Contractor shall assume ownership of all data systems within area of work as defined by the plans. Contractor shall provide new outlets/jacks/cabling as required for systems to ensure permanent link solution testing. The requirement for this project is full compliance/zero tolerance. Cables which do not comply shall be removed and replaced. If certain cables do not comply, contractor shall notify engineer and may be deemed (at engineer's discretion) considered part of contractor's required "Additional Materials Requirement" in the specifications and be replaced with new.
- B. All materials, equipment and workmanship incorporated in the work shall be guaranteed by the Contractor for a period of fifteen years from the date of Substantial Completion of the project.
- C. Any work, material or equipment which during the warranty period is, in the opinion of the Engineer or the Owner's Authorized Representative, defective or inferior and not in accordance with the contract documents, shall be made good at no additional cost to the Owner, including any other work which may have been damaged because of such deficiencies. The Contractor shall be the contact person and the person responsible for coordinating all warranty work for the Owner.
- D. When equipment cannot be repaired at the site, the Contractor shall be completely and solely responsible for the coordination and completion of equipment repairs, including pickup at the project site, transportation and shipping costs to and from the repair site, and reinstallation and reintegration into the system. Equal or better loaner equipment shall be provided and installed by the Contractor any time equipment cannot be repaired at the site, so that the system is

maintained in continuous working order as before the equipment failed.

- E. The services of a qualified technician shall be available to make necessary warranty repairs in a timely manner during the warranty period.

3.7 SUPPORT SERVICES

A. Service Description:

1. System Startup: After Equipment Verification and before Final Checkout, the Contractor shall start the systems up, and in coordination with the Owner make it fully operational. The System Startup shall be made at a time, approved in writing by the School District, when school is not in regular session. A weekend startup may be required, and if so shall be provided at no additional cost to the School District. All existing circuits and connections disturbed by work under this contract shall be reconnected, properly identified/labeled, and checked out for proper operation during the System Startup.
2. Final checkout: After System Startup and before the first day of school following System Startup, the Contractor shall perform a Final Checkout of the system as a whole to verify that it is ready for use by school personnel. The Contractor shall utilize a Final Checklist to fully document Final Checkout. Provide a copy of the Final Checklist to the Engineer at the Final Inspection.
3. First day operation: The Contractor shall have a senior technician present at the site for the first full 8 hour day of school following the Final Checkout to train/assist school personnel and to verify/fine tune system operation. The senior technician shall make follow-up visits as required to bring the system into full operating condition to the satisfaction of the School Principal, the Owner's Authorized Representative, and the Engineer.

B. Documentation:

1. Manufacturer shall provide system documentation including:
2. System one-line showing all patch panels, racks, number and type of devices and the connections between systems and to the service entrance.
3. Drawings for each system showing hardware configuration and numbering.
4. Typical wiring diagrams for each component.
5. The manufacturer will certify that the products will meet the product specifications.

END OF SECTION