



McKEE & ASSOCIATES
ARCHITECTS, INC.

Project Manual



New Softball Complex

at

Daphne High School

for the

Baldwin County Board of Education
Daphne, Alabama

Project No: **23.199**
June 4, 2024

Alabama Division of Construction Management No.

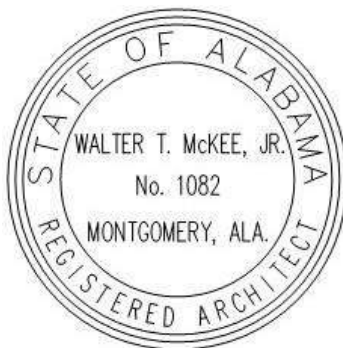


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New Softball Complex at
Daphne High School for the
Baldwin County Board of Education
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ADVERTISEMENT FOR BIDS

NEW SOFTBALL COMPLEX AT DAPHNE HIGH SCHOOL FOR THE BALDWIN COUNTY BOARD OF EDUCATION DAPHNE, ALABAMA

MCKEE PROJECT NO. 23-199

Sealed proposals for this project shall be received by Mrs. Marlana Hanner, Purchasing Supervisor, Baldwin County Board of Education, 23651 Flowers Road, Robertsdale, AL 36567 | 251-947-8403, until 2:00 PM Central Time, on Tuesday, July 16, 2024, then open and read aloud.

A Non-Mandatory Pre-Bid Conference shall be held on Wednesday, July 10, 2020 @ 10:00 AM Central Time on site.

All General Contractors bidding on these projects shall be encouraged 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.

This 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 No bid may be withdrawn after scheduled closing for receipt of bids for a period of ninety (90) days.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 Public Schools** 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

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: McKee and Associates Architects, Inc., 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: McKee & Associates, Architects
Jacky Barganier, Project Manager
barganierj@mckeeassoc.com
Email

From: _____
Name

Company

Email

Project: _____

Project Number: _____

Request For Information Number: _____

Issue Date: _____

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: _____ Article/Paragraph: _____

Drawing Sheet Number: _____ Title: _____
Plan: _____ Elevation: _____ Section: _____ Detail: _____

New Softball Complex at
Daphne High School for the
Baldwin County Board of Education
Daphne, Alabama

REQUEST FOR INFORMATION (RFI)
0000- 1

Project No: 23.199

Other:

RECEIVERS REPLY:

Signed by: _____ Date: _____ Copies to: _____

New Softball Complex at
Daphne High School for the
Baldwin County Board of Education
Daphne, Alabama

REQUEST FOR INFORMATION (RFI)
0000- 2

Project No: 23.199

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: McKee & Associates, Architects Substitution Request Number: _____

Jacky Barganier From: _____

barganierj@mckeeassoc.com Date: _____
Email

Project: _____ A/E Project Number: _____

Re: _____ Contract For: _____

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 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

Substitution Approved

Substitution Approved as noted

Substitution Rejected

Substitution Request Received to Late

Comments:

Signed by:

Date:

New Softball Complex at
Daphne High School for the
Baldwin County Board of Education
Daphne, Alabama

PRIOR APPROVAL / SUBSTITUTION REQUEST FORM
0000-2

Project No: 23.199

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.

CONTRACTOR COMPLETION TIME FORM

This Form **MUST** be submitted with the sealed Proposal.

New Softball Complex
at
Daphne High School
for the
Baldwin County Board of Education
Daphne, Alabama

Project No: 23.199

Legal Name of Bidder _____

Mailing Address _____

Per Section 01010, Scope of Work, the General Contractor MUST state his/her completion time on their Bid Proposal Form. The Contractor's Completion Time will be taken into consideration for award of the construction contract.

The General Contractor MUST use this Completion Time Form to state his/her completion time. This Form MUST be submitted with the sealed Proposal.

COMPLETION TIME:

All work shall be completed in **Calendar days** from Notice to Proceed issued by the Architect.

Legal Signature of Bidder _____

UNIT PRICE ITEM LEGEND

New Softball Complex
at
Daphne High School
for the
Baldwin County Board of Education
Daphne, Alabama

Project No: 23.199

Legal Name of Bidder _____

Mailing Address _____

The General Contractor shall include the Unit Prices below in their Base Bid Proposal. **The quantities assigned below are above and beyond the amounts required to complete the work required by the bid documents.** This Unit Price Item Legend shall be submitted with the sealed Proposal.

SCHEDULE OF UNIT PRICES:

UNIT PRICES: The Unit Prices below establishes Unit Prices so that the Owner can delete/add quantities from the Contract(s) required.

UNIT PRICE #1: The Contractor shall include in his Base Bid proposal the cost for an **Additional 100** Cubic Yards Measured In Place (CYMIP) of removal and off-site disposal of unsuitable soil and furnishing, placing and compacting of acceptable fill material from below the finished subgrade and tested to meet requirements specified for the affected area, in accordance with the Geotechnical Report and Section 02200 "Earthwork."

100 CYMIP @ _____/CYMIP = \$ _____ Included in Base Bid

UNIT PRICE #2: The Contractor shall include in his Base Bid proposal **50** Cubic Yards Measured In Place (CYMIP) for excavation of unsuitable soils, disposal off site of excavated material and furnishing and installation of lean concrete mud footing "mud sill" in accordance with the Geotechnical Report and Section 02200 "Earthwork."

50 CYMIP @ _____ per CYMIP = \$ _____ Included in Base Bid

Note: This unit price is not applicable to cost of mud footings that are required due to over-excavation, or due to not pouring footings the same date they are excavated, or other reasons indicated in Section 02200 - "Earthwork," or Section 03310 - "Concrete."

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) \$ _____

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

Legal Name of Bidder _____

Mailing Address _____

***By (Legal Signature)** _____

*Name (type or print) _____

(Seal)

*Title _____

Telephone Number _____

Email Address _____

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

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: rawlinsonk@mckeeassoc.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 rawlinsonk@mckeeassoc.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.

**PREPARATION AND APPROVAL OF
CONSTRUCTION
CONTRACTS and BONDS
SUBMITTED ON PAPER**

CHECKLIST

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

| | |
|--|---|
| <p align="center">CONSTRUCTION CONTRACT - DCM Form C-5 or DCM Form 9-A (PSCA Projects)</p> <p>Three copies of documents with original signatures required. The numbers in the left column below correspond to numbers in the left margin of the Contract form. If the project is funded partially or fully by the Alabama Public School and College Authority (PSCA), use DCM Form 9-A instead of DCM Form C-5.</p> | |
| (1) | <p>PROJECT NUMBER(S): Insert the DCM (BC) Project Number in the block provided.</p> <ul style="list-style-type: none"> On DCM Form 9-A, also insert the PSCA Project Number in the block provided. |
| (2) | <p>DATE: Insert the date upon which the Contractor will sign the contract.</p> |
| (3) | <p>OWNER: Insert the full, legal name, address, email, and telephone number of the Owner (Awarding Authority).</p> <ul style="list-style-type: none"> 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) | <p>CONTRACTOR: Insert the Contractor’s full, legal 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) 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 STAARS rejection.</p> <ul style="list-style-type: none"> On DCM Form 9-A: The Contractor Company name and address must match the name and address registered in STAARS 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 STAARS rejection. |
| (5) | <p>The WORK: Insert the complete name of the Project; same as in the Bid Documents.</p> |
| (6) | <p>CONTRACT DOCUMENTS: Insert the date of the Bid Documents</p> |
| (7) | <p>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.</p> |
| (8) | <p>ARCHITECT: Insert the full, legal name, address, email, and telephone number of the Project Architectural or Engineering firm.</p> |
| (9) | <p>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.</p> |
| (10) | <p>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.</p> |
| (11) | <p>The CONTRACT TIME: State the Contract Time in words and in figures.</p> |
| (12) | <p>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.</p> |
| (13) | <p>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.</p> <ul style="list-style-type: none"> 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) | <p>STATE GENERAL CONTRACTOR’S LICENSE: Insert the Contractor’s current state general contracting license number, bid limit, and classification in the spaces provided.</p> |

| | |
|-------------|---|
| (15) | SIGNATURES - APPROVING and CONTRACTING PARTIES Signature spaces vary for different Owner types and funding sources. Download the appropriate document per Owner/funding type from www.dcm.alabama.gov/forms.aspx . Original signatures required; copies of signatures will not be accepted. |
|-------------|---|

**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)**

Before forwarding the Construction Contract and Bonds to the Owner, verify that the Surety has accurately provided all information in the spaces provided. The information should be the same on both Bonds.

| | |
|-------------|---|
| (1) | SURETY’S BOND NUMBER should be inserted in the block 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 Contractor and Surety sign 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 LEGIBLY 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 LEGIBLY beneath the signature. |
| (11) | ATTACHED POWER OF ATTORNEY: Clipped to each copy of the Bonds must be a Power of Attorney, signed by an officer of the bonding company, for the individual 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 each of the three (3) Construction Contract copies:
- 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 all insurance coverage specified in Article 37 of the General Conditions of the Contract - required per Section 39-2-8 of the Code of Alabama.
 - Performance Bond: required for contracts of \$50,000.0 or more, attach original with surety’s power-of-attorney original - required per Section 39-2-8 of the Code of Alabama.
 - Payment Bond: required for contracts of \$50,000.0 or more, attach original with surety’s power-of-attorney original - required 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): copy 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 Disclosure Statement (attach original) - required per Section 41-16-82 of the Code of Alabama.

FORWARDING CONTRACT and ATTACHMENTS

After determining that the Construction Contract (signed by the Contractor) and attachments are in order, the design professional shall forward all three (3) copies of these documents (with original signatures) to the Owner for signature. The Owner shall then forward the documents per the Review/Signature Flow instructions specified on the contract form underneath the signature block.

SUBMITTAL TO DCM:

- All contract documents and attachments must be single-sided on letter-sized paper without staples; use clips. Purpose: quickly and efficiently scan thousands of documents into DCM's database. Scanners compatible with the database do not scan double-sided nor legal-sized paper.
- Contracts with double-sided printing will not be accepted.
- The Contract Document Administration Fee-CC and the Permit Fee must be paid by the time a Construction Contract for a state agency project, Alabama Community College System (ACCS) project or PSCA-funded 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.
- 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).

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, ACCS 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.

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 is due when a construction contract or self-performance letter is received by DCM, and must be paid before a Pre-Construction Conference is scheduled with DCM Inspectors for any type of project. Note: although DCM does not review the construction contracts of non-ACCS public higher education institutions such as two and four-year universities, the permit fee must be paid before a required Pre-Construction Conference is scheduled with DCM Inspectors for such projects.

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 (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 webpage https://dcm.alabama.gov/forms_publicK12.aspx by the Lead Design Professional Firm.

DCM (BC) Project No.

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

CONSTRUCTION CONTRACT

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

- (11) **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 webpage https://dcm.alabama.gov/forms_publicK12.aspx.

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.

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

(1) PERFORMANCE BOND

SURETY'S BOND NUMBER

Do not staple this form; use clips.

(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

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.

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. OWNER:** The Owner is the entity or entities identified as such in the Construction Contract and is referred to throughout the Contract Documents as if singular in number. The term “Owner” means the Owner or the Owner’s authorized representative. The term “Owner” as used herein shall be synonymous with the term “Awarding Authority” as defined and used in Title 39 - Public Works, Code of Alabama, 1975, as amended.
- O. THE PROJECT:** The Project is the total construction of which the Work required by these Contract Documents may be the entirety or only a part with other portions to be constructed by the Owner or separate contractors.
- P. PROJECT MANUAL:** The Project Manual is the volume usually assembled for the Work which may include the Advertisement for Bids, Instructions to Bidders, sample forms, General Conditions of the Contract, Supplementary Conditions, and Specifications of the Work.
- Q. SPECIFICATIONS:** The Specifications are that portion of the Contract Documents which set forth in writing the standards of quality and performance of products, equipment, materials, systems, and services and workmanship required for acceptable performance of the Work.
- R. SUBCONTRACTOR:** A Subcontractor is a person or entity who is undertaking the performance of any part of the Work by virtue of a contract with the Contractor. The term “Subcontractor” means a Subcontractor or its authorized representatives.
- S. THE WORK:** The Work is the construction and services required by the Contract Documents and includes all labor, materials, supplies, equipment, and other items and services as are necessary to produce the required construction and to fulfill the Contractor’s obligations under the Contract. The Work may constitute the entire Project or only a portion of it.

ARTICLE 2

INTENT and INTERPRETATION of the CONTRACT DOCUMENTS

A. 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 phrases 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" × 11" for DCM's scanning purposes and shall divide the Contract Sum into as many parts ("line items") as the Architect and Owner determine necessary to permit evaluation and to show amounts attributable to Subcontractors. The Contractor's overhead and profit are to be proportionately distributed throughout the line items of the Schedule of Values. Upon approval, the Schedule of Values shall be used as a basis for monthly Applications for Payment, unless it is later found to be in error. Approved change order amounts shall be added to or incorporated into the Schedule of Values as mutually agreed by the Contractor and Architect.

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

D. MATERIALS STORED OFF SITE

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

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

the materials or equipment are clearly marked in correlation to the inventory to facilitate inspection and verification of the presence of the materials or equipment by the Architect or Owner;

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

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

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

G. PAYMENT ESTABLISHES OWNERSHIP

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

ARTICLE 30
CERTIFICATION and APPROVALS for PAYMENT

- A. The Architect's review, approval, and certification of Applications for Payment shall be based on

the Architect's general knowledge of the Work obtained through site visits and the information provided by the Contractor with the Application. The Architect shall not be required to perform exhaustive examinations, evaluations, or estimates of the cost of completed or uncompleted Work or stored materials to verify the accuracy of amounts requested by the Contractor, but the Architect shall have the authority to adjust the Contractor's estimate when, in the Architect's reasonable opinion, such estimates are overstated or understated.

- B.** Within seven days after receiving the Contractor's monthly Application for Payment, or such other time as may be stated in the Contract Documents, the Architect will take one of the following actions:
- (1)** The Architect will approve and certify the Application as submitted and forward it to the Owner as a Certification for Payment for approval by the Owner (and other approving authorities, if any) and payment.
 - (2)** If the Architect takes exception to any amounts claimed by the Contractor and the Contractor and Architect cannot agree on revised amounts, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to certify to the Owner, transmitting a copy of same to the Contractor.
 - (3)** To the extent the Architect determines may be necessary to protect the Owner from loss on account of any of the causes stated in Article 31, the Architect may subtract from the Contractor's estimates and will issue a Certificate for Payment to the Owner, with a copy to the Contractor, for such amount as the Architect determines is properly due and notify the Contractor and Owner in writing of the Architect's reasons for withholding payment in whole or in part.
- C.** Neither the Architect's issuance of a Certificate for Payment nor the Owner's resulting progress payment shall be a representation to the Contractor that the Work in progress or completed at that time is accepted or deemed to be in conformance with the Contract Documents.
- D.** The Architect shall not be required to determine that the Contractor has promptly or fully paid Subcontractors and suppliers or how or for what purpose the Contractor has used monies paid under the Construction Contract. However, the Architect may, upon request and if practical, inform any Subcontractor or supplier of the amount, or percentage of completion, approved or paid to the Contractor on account of the materials supplied or the Work performed by the Subcontractor.

ARTICLE 31 **PAYMENTS WITHHELD**

- A.** The Architect may nullify or revise a previously issued Certificate for Payment prior to Owner's payment thereunder to the extent as may be necessary in the Architect's opinion to protect the Owner from loss on account of any of the following causes not discovered or fully accounted for at the time of the certification or approval of the Application for Payment:
- (1)** Defective Work;
 - (2)** filed, or reasonable evidence indicating probable filing of, claims arising out of the Contract by other parties against the Contractor;
 - (3)** the Contractor's failure to pay for labor, materials or equipment or to pay Subcontractors;
 - (4)** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract

Sum;

- (5) damage suffered by the Owner or another contractor caused by the Contractor, a Subcontractor, or anyone for whose acts they may be liable;
 - (6) reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance is insufficient to cover applicable liquidated damages; or
 - (7) the Contractor's persistent failure to conform to the requirements of the Contract Documents.
- B.** If the Owner deems it necessary to withhold payment pursuant to preceding Paragraph A, the Owner will notify the Contractor and Architect in writing of the amount to be withheld and the reason for same.
- C.** The Architect shall not be required to withhold payment for completed or partially completed Work for which compliance with the Contract Documents remains to be determined by Specified Inspections or Final Inspections to be performed in their proper sequence. However, if Work for which payment has been approved, certified, or made under an Application for Payment is subsequently determined to be Defective Work, the Architect shall determine an appropriate amount that will protect the Owner's interest against the Defective Work.
- (1) If payment has not been made against the Application for Payment first including the Defective Work, the Architect will notify the Owner and Contractor of the amount to be withheld from the payment until the Defective Work is brought into compliance with the Contract Documents.
 - (2) If payment has been made against the Application for Payment first including the Defective Work, the Architect will withhold the appropriate amount from the next Application for Payment submitted after the determination of noncompliance, such amount to then be withheld until the Defective Work is brought into compliance with the Contract Documents.
- D.** The amount withheld will be paid with the next Application for Payment certified and approved after the condition for which the Owner has withheld payment is removed or otherwise resolved to the Owner's satisfaction.
- E.** The Owner shall have the right to withhold from payments due the Contractor under this Contract an amount equal to any amount which the Contractor owes the Owner under another contract.

ARTICLE 32

SUBSTANTIAL COMPLETION

- A.** Substantial Completion is the stage in the progress of the Work when the Work or designated portion of the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use without disruption or interference by the Contractor in completing or correcting any remaining unfinished Work ("punch list" items). Substantial Completion of the Work, or a designated portion of the Work, is not achieved until so agreed in a Certificate of Substantial Completion signed by the Contractor, Architect, Owner, and Technical Staff of the Alabama Division of Construction Management.
- B.** The Contractor shall notify the Architect in writing when it considers the Work, or a portion of the Work which the Owner has agreed to accept separately, to be substantially complete and ready for a

Final Inspection pursuant to Article 16. In this notification the Contractor shall identify any items remaining to be completed or corrected for Final Acceptance prior to final payment.

- C. Substantial Completion is achieved and a Final Inspection is appropriate only when a minimal number of punch list items exists and only a short period of time will be required to correct or complete them. Upon receipt of the Contractor's notice for a Final Inspection, the Architect will advise the Contractor in writing of any conditions of the Work which the Architect or Owner is aware do not constitute Substantial Completion, otherwise, a Final Inspection will proceed within a reasonable time after the Contractor's notice is given. However, the Architect will not be required to prepare lengthy listings of punch list items; therefore, if the Final Inspection discloses that Substantial Completion has not been achieved, the Architect may discontinue or suspend the inspection until the Contractor does achieve Substantial Completion.

D. CERTIFICATE of SUBSTANTIAL COMPLETION

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

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

- (a) the Work, or designated portion of the Work, is accepted by the Architect, Owner, and Alabama Division of Construction Management as being ready for occupancy,
- (b) the Contractor's one-year and special warranties for the Work covered by the Certificate commence, unless stated otherwise in the Certificate (the one-year warranty for punch list items completed or corrected after the period allowed in the Certificate shall commence on the date of their Final Acceptance), and
- (c) Owner becomes responsible for building security, maintenance, utility services, and insurance, unless stated otherwise in the Certificate.

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

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

- E. The Date of Substantial Completion of the Work, as set in the Certificate of Substantial Completion of the Work or of the last completed portion of the Work, establishes the extent to which the Contractor is liable for Liquidated Damages, if any; however, should the Contractor fail to complete all punch list items within thirty days, or such other time as may be stated in the respective Certificate of Substantial Completion, the Contractor shall bear any expenses, including additional Architectural services and expenses, incurred by the Owner as a result of such failure to complete punch list items in a timely manner.

ARTICLE 33
OCCUPANCY or USE PRIOR to COMPLETION

A. 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.

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. There shall be three original P&P Bonds submitted with original signatures for each of the three contracts required. The P&P bonds must be signed either on the same day or after the construction contract date. Each P&P Bond shall have attached thereto an original power of attorney (POA) of the signing official. The POA signature date must be the same day as the P&P Bond's signature date. All signatures must be present.

The provisions of this Article are not applicable to this Contract if the Contract Sum is less than \$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

In compliance with Ala. Act No. 2023-409, by signing this contract, the contracting parties provide written verification that they, without violating controlling law or regulation, do not and will not, during the term of the contract engage in economic boycotts as the term “economic boycott” is defined in Section 1 of the Act. This requirement applies to contracts entered into on or after October 1, 2023 if a contracting party employs 10 or more employees and the contract could exceed \$15,000 over the term of the contract. Under Section 2 of the Act, the written verification may be waived if the contracting governmental entity determines based on cost and quality factors that such a waiver is clearly in the best interest of the public.

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 **McKee and Associates, Architects**, 631 South Hull Street, Montgomery, Alabama, 36104, (334) 834-9933 `commissioned by the Owner.
2. **Owner:** **Baldwin County Board of Education** 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: submittals@mckeeassoc.com or Submittal Exchange if applicable.
- 2) Submittals regarding mechanical, plumbing, electrical and structural items shall be sent directly to the Engineer of record (see cover sheet of the specification for address). A digital copy of the transmittal shall be sent to the Architect at the following email address: submittals@mckeeassoc.com or Submittal Exchange if applicable.

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 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.
- J. **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.
- K. **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.
- L. **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.
- M. **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
 - 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
- N. **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 Article 3B of Title 41, Code of Alabama 1975

ENTITY COMPLETING FORM

ADDRESS

CITY, STATE, ZIP

TELEPHONE NUMBER

STATE AGENCY/DEPARTMENT THAT WILL RECEIVE GOODS, SERVICES, OR IS RESPONSIBLE FOR GRANT AWARD

ADDRESS

CITY, STATE, ZIP

TELEPHONE NUMBER

This form is provided with:

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 |
|----------------------------------|---------|-------------------------|
| | | |
| | | |
| | | |

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

Article 3B of Title 41, Code of Alabama 1975 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.



November 2023

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
6/21

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 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 | | | | | |

| | | | | | |
|--|--|---|--|--|--|
| CONTRACT SIGN DATE (PROVIDED BY GENERAL CONTRACTOR) | | CONTRACT COMPLETION DATE (PROVIDED BY GENERAL CONTRACTOR) | | | |
| ESTIMATED START DATE (FOR APPLICANT) | | ESTIMATED COMPLETION DATE (FOR APPLICANT) | | | |
| WILL THE APPLICANT HAVE ANY SUBCONTRACTORS ON THIS JOB? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, please attach list. | | NAME OF PARTY TO THE CONTRACT | | | |

JOB DESCRIPTION

| | | | | | |
|---|--|---|--|--|--|
| WILL ANY POLLUTION CONTROL EXEMPTION BE APPLICABLE? <input type="checkbox"/> Yes <input type="checkbox"/> 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 Contract 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 contract sign 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.

***** Please allow 10 to 14 business days for your application to be processed. *****

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)
6. Any other municipal business licenses associated with the project

Subcontractor:

1. Signed Application
2. Alabama Board of General Contractor's License
3. State/County Business License (usually obtained through county probate office)
4. Any other municipal business licenses associated with the project
5. 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.
- Subcontractor's Estimated Start Date should be the date they will begin working on the project and ordering materials instead of the General Contractor's Estimated Start Date for the project.

THERE IS A FILING REQUIREMENT IF YOUR APPLICATION IS APPROVED. The return will be filed through the Consumer's Use Tax account. Please see the following page for detailed instructions and general information regarding the reporting requirements.

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

Fax: (334) 353-7867

Email: STExemptionUnit@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

General Information and Instructions Regarding the Reporting Requirements for Contractors Awarded an Exemption Certificate

A contractor's exemption certificate for a Government Entity project is needed in order to purchase materials tax exempt for the qualified project. Once the exemption certificate has been applied for and awarded, there is a monthly filing requirement to report the purchases that have been made for each exempt project. The Consumer's Use (CNU) tax account is used to report the tax-exempt purchases made with each certificate for each exempt project for each month.

The consumer's use tax return must be filed for each of the months covered by the exemption certificate. (For example, if the certificate's effective date is June 29, 2014 and the expected completion date is October 1, 2014, a consumer's use tax return must be filed for each of the following months: June, July, August, September, and October.) A return MUST be filed each month to report the monthly purchases. Therefore, all active exemption certificates must be included on the monthly report even if the monthly purchases for a specific project was \$0.

If a CNU tax account is not already open under the taxpayer/business name, one will automatically be assigned at the time the exemption certificate is generated. Electronic filing is required through the Department's online filing system, My Alabama Taxes (MAT). A letter containing the online filing information will be mailed to the address on file within a few days after the new CNU tax account has been assigned. This letter will contain all the information needed to create your online filing account in MAT. For questions relating to setting up the account on www.myalabamataxes.alabama.gov, please contact Business Registration at 334-242-1584 or the Sales Tax Division at 1-866-576-6531.

Once the MAT account is set up, please log in and file the monthly CNU tax return. There is a table located at the bottom left hand corner labeled "Contractor's Exemption for Government Construction Projects." All three fields in the table are required to be completed: exemption number, project number, and total amount of purchases for that specific project for the month. Additional projects may be added on the additional rows that appear as data is added; the table will allow the addition of more projects.

***Please do not use lines 1 through 9 of the return for reporting exempt project information. Leave these lines blank unless taxable purchases were made outside of the state of Alabama that need to be reported and tax remitted. (Lines 1 through 9 do not have anything to do with the exemption reporting requirements).

When the certificate expires (upon the project's completion) and the CNU tax account is no longer needed, please contact the Business Registration Unit at 334-242-1584 and close the CNU tax account. Please be advised that if there are multiple government entity projects open, the consumer's use tax account should remain open until the last project completion date. For example, if Project EXC00ABCD ends in June of 2014 but Project EXC00EFGH ends January of 2015, the CNU tax account must remain open until the end of January 2015. A return for Project EXC00EFGH must be filed all the way through January 2015.

If the applicant already has a CNU tax account and it is currently set up online, please use this account to report exempt project purchases through www.myalabamataxes.alabama.gov using the instructions provided above. The return may then be filed as usual.

***All Consumer's Use Tax returns are due on the 20th of the month following the month in which purchases were made (i.e., the return for the month of June is due July 20th, etc. There are 20 days to file the return before it is deemed late.)

***Any penalty waiver requests may be directed to the Sales and Use Tax Division at 1-866-576-6531. Only one waiver per 18 month period is allowed.



ALABAMA DEPARTMENT OF FINANCE
REAL PROPERTY MANAGEMENT
Division of Construction Management

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

Revised December 2021

Department Use Only
Invoice #
Date Paid
Confirmation #

PERMIT FEE & PERMIT RE-INSPECTION FEE CALCULATON WORKSHEET

DCM (BC) #
Date
Project Name; Owner/Architect/Engineer Project # & Phase/Package #
Owner Entity Name
Architect/Engineer Firm Name
Contractor Company Name
Select only ONE of the following:
Basic Permit Fee. Fee is based on awarded contract sum.
Permit Re-Inspection Flat Fee.
Awarded Contract Sum:
Email address(es) for Payment Receipt:

BASIC PERMIT FEE CALCULATION:

Awarded Contract Sum is less than \$1,000: N/A

Awarded Contract Sum is \$1,001 - \$50,000:

Contract Sum or Shelter Estimate less \$1,000= /1,000 x \$5.00= +\$15.00=

Awarded Contract Sum is \$50,001 - \$100,000:

Contract Sum or Shelter Estimate less \$50,000= /1,000 x \$4.00= +\$260.00=

Awarded Contract Sum is \$100,001 - \$500,000:

Contract Sum or Shelter Estimate less \$100,000= /1,000 x \$3.00= +\$460.00=

Awarded Contract Sum is \$500,001 and up:

Contract Sum or Shelter Estimate less \$500,000= /1,000 x \$2.00= +\$1,660.00=

PERMIT RE-INSPECTION FEE:

Flat fee of \$1,500.00 per occurrence

TOTAL DUE:

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

State agency inter-fund transfer and payments using Public School and College Authority (PSCA) funds: contact Jennie Jones at 334-242-4808 or jennie.jones@realproperty.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.

PRE-CONSTRUCTION CONFERENCE CHECKLIST

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

**Item 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. Approved cost breakdown & Progress Schedule |
| | 9. 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 website. Fully locally-funded University and fully locally-funded K-12 projects: submit payment applications per Owner requirements. |
| | 10. Change Orders - Documentation - no prior work, unless authorized in writing All State Agency, public K-12, and PSCA-funded projects: change orders must be submitted via DocuSign PowerForm links available from DCM's website. Fully locally-funded University projects: submit change orders per Owner requirements. |
| | 11. Shop drawings, time to process |
| | 12. Advance notice for required 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 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@rpm.alabama.gov . 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 contractor is not ready for the scheduled inspection he shall incur a \$1,500.00 re-inspection fee. |
| | 13. Inspection Minimum Requirements The following minimum requirements listed below are provided to aid the contractors and architect in determining if a project is ready for a required inspection. <u>Pre-Construction Conference: Required Attendees: Contractor, Owner, Architect, Major Subs</u> <ul style="list-style-type: none"> • 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 both an estimated cost of \$750,000.00 or Less, and a contract awarded on or after 10/01/22, are exempt from DCM Fees.) • Owner's statement of responsibility (storm shelter) • Contractor's statement of responsibility and quality assurance plan (storm shelter) • Fire alarm contractor and fire sprinkler contractor certification (from State Fire Marshal) • ADEM permit, if more than one acre of land is disturbed |

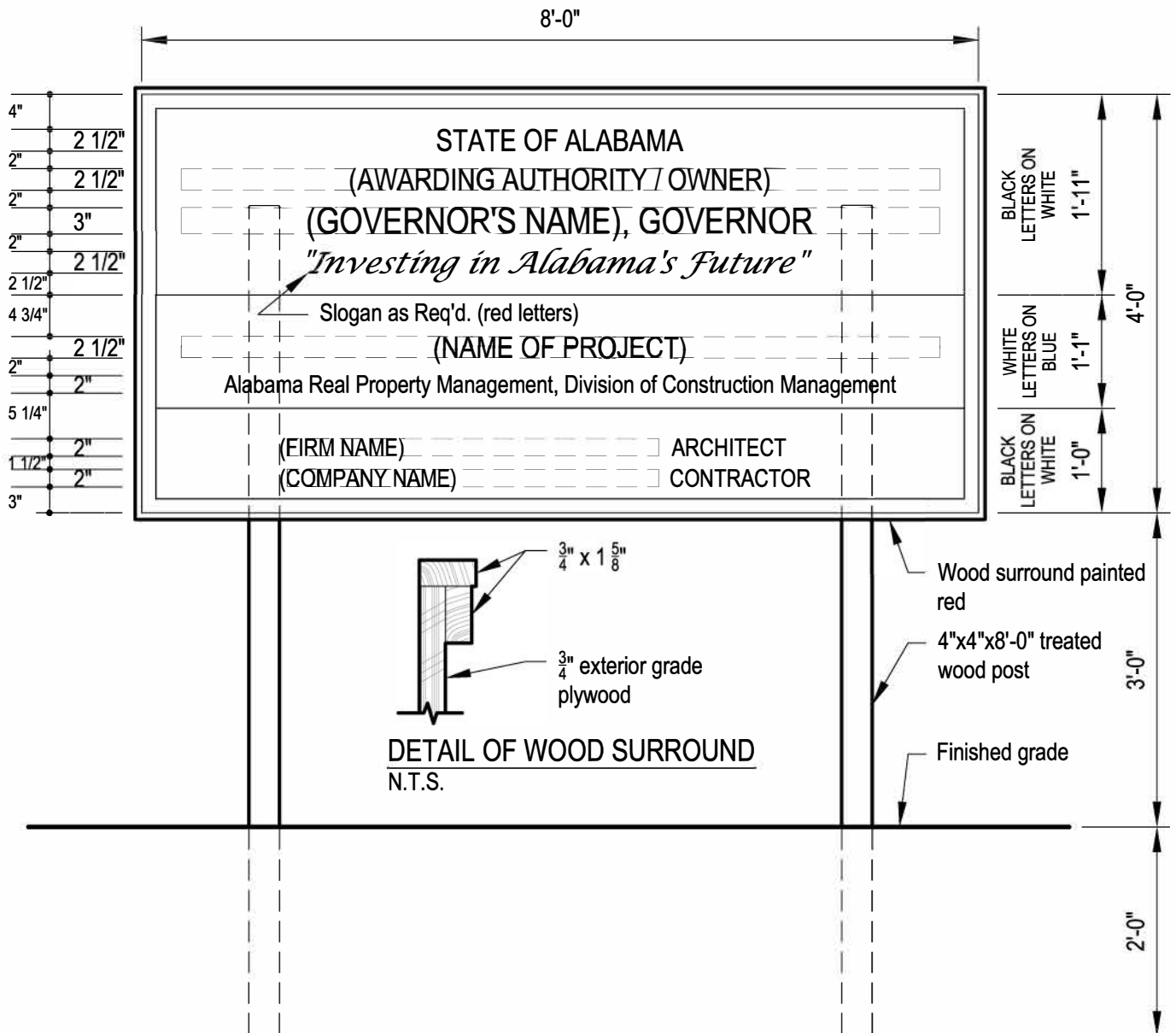
| | |
|--|--|
| | <p>13. <u>Pre-Construction Conference for Storm Shelter</u>: Required Attendees: Contractor, Owner, Architect, Structural Engineer, Major Subs, Special Inspections Representative</p> <ul style="list-style-type: none"> • The completed & signed DCM Form B-15: Owner's Statement of Responsibility for Tornado Storm Shelter (Hurricane Shelter Where Applicable) must be submitted to the DCM Inspector at Pre-Construction Conference. • 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. <p><u>Pre-Roofing Conference</u>: Required Attendees: Contractor, Owner, Architect, Roofing Sub, Roofing Manufacturer's Representative</p> <ul style="list-style-type: none"> • 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. <p><u>Above Ceiling Inspections</u>: Required Attendees: Contractor, Owner, Architect, MEP Engineers, Major Subs</p> <ul style="list-style-type: none"> • 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 <p><u>Life Safety Inspections and Final Inspection</u>: Required Attendees: Contractor, Owner, Architect, Engineers, Major Subs, Local Fire Marshal</p> <ul style="list-style-type: none"> • 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 <p><u>Year-End Inspection</u>: Required Attendees: Contractor, Owner, Architect, Engineers and/or Major Subs may be required</p> <ul style="list-style-type: none"> • Owner's list of documented warranty items • Reconciliation of user fees with DCM shall be completed prior to inspection |
| | 14. Other inspections required before work is covered |
| | 15. Inspection report distribution – weekly per Owner-Architect Agreement |
| | 16. Record Drawings, definition of, procedures, addenda posted, etc. |
| | *17. Project sign and other job signs |
| | 18. Point of contact for project. Job Superintendent and phone number. |
| | *19. Overall phasing of job |
| | 20. Contractor's duty to coordinate work of separate contractors |

| | |
|--|--|
| | *21. Use of site and existing building, access drive, signs |
| | *22. Use of existing toilets |
| | *23. Coordinate any utilities supplied by Owner |
| | *24. Coordinate outages and work in existing building with Owner |
| | 25. Keeping existing exit paths open |
| | 26. Routine job cleanup |
| | 27. O.S.H.A. - Report all accidents - safety General Contractor's responsibility |
| | 28. Contractor is reminded of obligation to comply with the Alabama Child Labor Law and E-verify |
| | 29. Project limits |
| | 30. Building location relative to critical property line, easement, setback, etc. |
| | 31. Locating property line, corners, etc. |
| | 32. Verify sanitary outfall before committing floor level |
| | 33. ADEM land disturbance permits shall be required if site is over 1-acre. |
| | 34. Procedure if bad soil or rock is encountered: Geotech and special inspections |
| | 35. Stockpiling topsoil |
| | 36. Protecting trees |
| | 37. Soil compaction, type soil, lab tests, etc. |
| | 38. Soil Treatment, mix on site in presence of Job Superintendent |
| | 39. Surveyor to check foundation wall if location critical |
| | 40. Ready mix plant, file delivery tickets, slump tests, cylinders |
| | 41. Quality of concrete work; concrete testing |
| | 42. Inspections before pouring concrete |
| | 43. What is expected of masonry work, mortar additive |
| | 44. Problems with hollow metal - install proper fire labels |
| | 45. Pre-roofing Conference - no roofing materials installed prior to conference, all roofing submittals and warranties must have been reviewed and approved by the Architect prior to the Pre-roofing Conference. Manufacturer's Representative must be present at Pre-roofing conference. The Roofing Manufacturer must show compliance with the IBC wind and impact-resistance requirements. Contractor shall video existing building interior and exterior prior to roofing operations and provide copy to Owner. |
| | 46. General Contractor's Roofing Guarantee and Manufacturer's Roofing Warrantees 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 website. |
| | 47. Potential conflict of mechanical and electrical equipment; shop drawings |
| | 48. Return air plenums (no combustibles) |
| | 49. Fire damper installation issues |
| | 50. Certificate of Substantial Completion/Final Inspection All projects: Certificate must be activated via DocuSign PowerForm links after final inspection and receipt of DCM Inspector's report. DocuSign PowerForm links are available from DCM's website. |
| | 51. 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. |

| | |
|--|---|
| | 52. Elevators/Pressure Vessels must be inspected and approved by the State of AL Dept. of Labor prior to final inspection. |
| | 53. Life safety, fire alarm, sprinkler and kitchen hood fire suppression systems must be complete and certified prior to final Inspection. Also, exit and emergency lighting must be complete. |
| | 54. Comply with ADA requirements: plumbing fixture heights, toilet partition widths, turnaround, signage, parking lot striping, etc. |
| | 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. Light gauge metal roof framing and/or wood truss framing to be inspected by the structural engineer. |
| | 57. Comply with fire hydrant requirement; coordinate with local Fire Authority or State Fire Marshal. |
| | 58. Craft-faced insulation is not to be installed exposed. |
| | 59. Fire alarm contractor and fire sprinkler contractor must be permitted through the State of Alabama Fire Marshal's Office. Provide permits. |
| | 60. All sprinkler system valves must be electrically supervised |
| | *61. Fire alarm monitoring requirements |
| | 62. Storm Shelter requirements <ul style="list-style-type: none"> a. Contractor's Statement of Responsibility and Quality Assurance Plan – Provide paperwork at Pre-Construction Conference. Must be kept with Owner's storm shelter records. b. Certification of Structural Observations from the Structural Engineer of Record must be attached to the Certificate of Substantial Completion form via DocuSign. c. Owner's Statement of Responsibility for Tornado Storm Shelter (Hurricane Shelter Where Applicable) - Provide paperwork at Pre-Construction Conference. Must be kept with Owner's storm shelter records. |
| | 63. Third-party inspections/special inspections |
| | 64. Release of retainage – 30 days to complete punch list and closeout |
| | *65. Sales tax savings (Alabama Department of Revenue) |
| | 66. Project Closeout - precedes Final Payment <ul style="list-style-type: none"> a. Warranties b. Operating and Maintenance Manuals c. As-built Drawings d. Other requirements |
| | 67. Advertisement of Completion - start ad after substantial completion <ul style="list-style-type: none"> 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 in one or more of the following ways: <ul style="list-style-type: none"> • 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. |
| | 68. Time Extensions |
| | 69. Final Payment Application checklist |

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 <small>(Form C-10SOV's Column F Total)</small> | \$ _____ |
| 2. Materials Presently Stored <small>(When this amount is greater than \$0.00, attach Form C-10SM: Inventory of Stored Materials, or similar list)</small> | + \$ _____ |
| 3. Total Work Completed to Date & Materials Presently Stored (_____ % of Contract To Date) | \$ _____ |
| 4. Less Retainage <small>(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.)</small> | - \$ _____ |
| 5. Total Due | \$ _____ |
| 6. Less Total Previous Payments Billed <small>(Must exactly match #5 Total Due from previous payment application. # 6 is \$0.00 if there is no previous payment application)</small> | - \$ _____ |
| 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 x 0.05. Once H exceeds 50% of C and up until project is complete, Retainage = C x 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.

| | | | | | | | | | | |
|--|--|--|--|--|--|--|----------------------------|--|--|--|
| SAMPLE PROGRESS SCHEDULE & REPORT | | | CONTRACTOR (Contractor may use own form in lieu of Form C-11): | | | | DATE OF REPORT: | | | |
| DCM (BC) No.: | | | | | | | PROCEED DATE: | | | |
| PSCA projects: PSCA No.: | | | | | | | PROJECTED COMPLETION DATE: | | | |
| PROJECT: | | | ARCHITECT/ENGINEER: | | | | | | | |

| 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

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 **McKee and Associates, Architects**, 631 South Hull Street, Montgomery, Alabama, 36104, (334) 834-9933 `commissioned by the Owner.
2. **Owner:** **Baldwin County Board of Education**. Unless otherwise stated, all papers required to be delivered to the Owner shall be forwarded through the Architect.

B. **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.

C. **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.

D. **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: andersong@mckeeassoc.com
 - 2) Submittals regarding mechanical, plumbing, electrical and structural items shall be sent directly to the Engineer of record (see cover sheet of the specification for address). A digital copy of the transmittal shall be sent to the Architect at the following email address: andersong@mckeeassoc.com

E. **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.

F. Refer to Article 15:

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

G. 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.

H. Refer to Article 32, SUBSTANTIAL COMPLETION

1. Add the following:
 - a. All manufactures 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.

I. 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.

J. 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.

K. 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

- b. 2015 International Building Code
- c. 2015 International Plumbing Code
- d. 2015 International Mechanical Code
- e. 2015 International Fuel Gas Code
- f. 2015 International Fire Code
- g. 2014 National Electrical Code
- h. 2013 National Fire Alarm and Signaling Code
- i. ANSI/ASHRAE/IESNA Standard 90.1-2013 Energy Standard for Buildings Except Low-Rise Residential

L. **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

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

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

**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 webpage https://dcm.alabama.gov/forms_publicK12.aspx by the Lead Design Professional Firm.

DCM Form C-12 (fully locally-funded K-12 school project)
June 2023

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 webpage https://dcm.alabama.gov/forms_publicK12.aspx.

Supplemental Accounting Requirement – Daphne High School Softball Complex for Baldwin County
23.199.

Prior to starting construction, the contractor shall provide the following breakdown of the various areas and value of the construction in each of the total project cost. Pay application number 1 can not be paid until this information is received.

DHS Field House _____

DHS Concession Stand(see allowances) _____

DHS Field _____

DHS Batting Shelter _____

DHS Visitor Dugout _____

| |
|--|
| |
| |
| |
| |
| |

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: <input type="checkbox"/> ADD <input type="checkbox"/> DEDUCT \$ _____ TIME EXTENSION: _____ CALENDAR DAYS | |
| (C) | 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.**

GENERAL CONTRACTOR'S ROOFING GUARANTEE

DCM Project No. _____

| | |
|------------------------|---|
| Project Name & Address | Project Owner Entity(ies) Name(s) & Address(es) |
|------------------------|---|

| | |
|--|---|
| General Contractor's Company Name, Address, & Telephone Number | EFFECTIVE DATES OF GUARANTEE |
| | Date of Acceptance: |
| | Date of Expiration: |

1. The General Contractor does hereby certify that the roofing work included in this contract was installed in strict accordance with all requirements of the plans and specifications and in accordance with approved roofing manufacturers recommendations.
2. The General Contractor does hereby guarantee the roofing and associated work including but not limited to all flashing and counter flashing both composition and metal, roof decking and/or sheathing; all materials used as a roof substrate or insulation over which roof is applied; promenade decks or any other work on the surface of the roof; metal work; gravel stops and roof expansion joints to be absolutely watertight and free from all leaks, due to faulty or defective materials and workmanship for a period of five (5) years, starting on the date of substantial completion of the project. This guarantee does not include liability for damage to interior contents of building due to roof leaks, nor does it extend to any deficiency which was caused by the failure of work which the general contractor did not damage or did not accomplish or was not charged to accomplish.
3. Subject to the terms and conditions listed below, the General Contractor also guarantees that during the Guarantee Period he will, at his own cost and expense, make or cause to be made such repairs to, or replacements of said work, in accordance with the roofing manufacturers standards as are necessary to correct faulty and defective work and/or materials which may develop in the work including, but not limited to: blisters, delamination, exposed felts, ridges, wrinkles, splits, warped insulation and/or loose flashings, etc. in a manner pursuant to the total anticipated life of the roofing system and the best standards applicable to the particular roof type in value and in accordance with construction documents as are necessary to maintain said work in satisfactory condition, and further, to respond on or within three (3) calendar days upon proper notification or leaks or defects by the Owner or Architect.

- A. Specifically excluded from this Guarantee are damages to the work, other parts of the building and building contents caused by: (1) lightning, windstorm, hailstorm and other unusual phenomena of the elements; and (2) fire. When the work has been damaged by any of the foregoing causes, the Guarantee shall be null and void until such damage has been repaired by the General Contractor, and until the cost and expense thereof has been paid by the Owner or by the responsible party so designated.
- B. During the Guarantee Period, if the Owner allows alteration of the work by anyone other than the General Contractor, including cutting, patching and maintenance in connection with penetrations, and positioning of anything on the roof, this Guarantee shall become null and void upon the date of said alterations. If the owner engages the General Contractor to perform said alterations, the Guarantee shall not become null and void, unless the General Contractor, prior to proceeding with the said work, shall have notified the Owner in writing, showing reasonable cause for claim that said alterations would likely damage or deteriorate the work, thereby reasonably justifying a termination of this Guarantee.
- C. Future building additions will not void this guarantee, except for that portion of the future addition that might affect the work under this contract at the point of connection of the roof areas, and any damage caused by such addition. If this contract is for roofing of an addition to an existing building, then this guarantee covers the work involved at the point of connection with the existing roof.
- D. During the Guarantee period, if the original use of the roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray cooled surface, flooded basin, or other use of service more severe than originally specified, this Guarantee shall become null and void upon the date of said change.
- E. The Owner shall promptly notify the General Contractor of observed, known or suspected leaks, defects or deterioration, and shall afford reasonable opportunity for the General Contractor to inspect the work, and to examine the evidence of such leaks, defects or deterioration.

IN WITNESS THEREOF, this instrument has been duly executed this _____ day
of _____, _____.

General Contractor's Authorized Signature

Typed Name and Title

TO: Alabama Department of Finance
Real Property Management
Division of Construction Management
 770 Washington Avenue, Suite 444
 Montgomery, AL 36130-1150
 (334) 242-4082

DCM Form C-13
 Revised November 2022;
 (Note: Use DCM Form C-13A for fully locally-funded K-12 & Public 4-
 Year University Capital Improvement, HVAC, & Roof Projects with both a
 total cost of \$750,000 or Less and a contract awarded on or after 10/01/22)

CERTIFICATE OF SUBSTANTIAL COMPLETION

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

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: _____ | DATE: _____ |
| CONTRACTING PARTIES: | |
| CONTRACTOR: _____ | DATE: _____ |
| OWNER: _____ | DATE: _____ |
| _____ | DATE: _____ |
| APPROVALS: | |
| DCM INSPECTOR: _____ | DATE: _____ |
| DCM CHIEF INSPECTOR: _____ | DATE: _____ |
| DCM DIRECTOR: _____ | DATE: _____ |

CERTIFICATE OF SUBSTANTIAL COMPLETION ROUTING PROCEDURE

Only 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.

ARCHITECT/ENGINEER: Sign and date document, then mail it to Contractor. Provide Owner with DCM Inspector's name & field office address; territories and addresses are available at www.dcm.alabama.gov/staff.aspx.

CONTRACTOR: Sign and date document, then mail it to Owner.

OWNER: Sign and date document, then mail it to DCM Inspector's field office address; DCM Inspector territories and addresses are available at www.dcm.alabama.gov/staff.aspx.

DCM INSPECTOR: Sign and date document, then mail it to DCM Montgomery office.

DCM OFFICE: After review and signature/date by DCM Chief Inspector and DCM Director, DCM office will mail the fully-executed original document to Owner and will email copies to all parties.

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.

DCM (BC) No. _____

CERTIFICATION OF STRUCTURAL OBSERVATIONS

for

Project Name: _____

Owner Entity: _____

Contractor Company: _____

I _____, do hereby verify that I have personally conducted the visual
_____ Design Professional
observations of the construction of the structural system for conformance to the approved construction documents for the referenced project. The visual observations of the structural systems were personally conducted by me at all significant construction stages and at the completion of the construction of the structural system. To the best of my knowledge, all structural deficiencies have been resolved except as noted below:

Signed and sealed on this date, _____, 20 ____.

Design Professional's Seal:

Architectural / Engineering Firm

Signature of Architect or Structural Engineer of Record

Printed Name

Specifications: This form must be included in the project manual submitted to DCM for Final Plan Review for:

- All new public K-12 schools, awarded after July 1, 2010, with tornado storm shelters as required by Act 2010-746.
- All public K-12 additions and renovations which are required to contain tornado storm shelters by the International Building Code, Section 423.
- All private K-12 new schools, additions and renovations as required by the International Building Code, Section 423.
- All new buildings containing classrooms or dorm rooms on the grounds of all public 2-year or 4-year institutions of higher education, statewide, awarded on or after August 1, 2012, as required by Act 2012-554. Exception: Alabama Community College System (ACCS) projects with Notice-To-Proceeds issued after July 31, 2021 are not submitted to DCM.

Submittal of Form: Provide a copy of the completed form to the DCM Inspector at Final Inspection. The original completed form, signed and sealed by the architect or structural engineer of record, must be included as an attachment to the Certificate of Substantial Completion submitted to DCM for:

- All new buildings constructed on the grounds of new public K-12 schools awarded after July 1, 2010.
- All new buildings containing classrooms or dorm rooms constructed on the grounds of public 2-year or 4-year institutions of higher education awarded on or after August 1, 2012. Exception: Alabama Community College System (ACCS) projects with Notice-To-Proceeds issued after July 31, 2021 are not submitted to DCM.

FINAL PAYMENT CHECKLIST (FPC)

To be completed by the Architect/Engineer and submitted to DCM for review; applicable only to state agencies, partially or fully PSCA-funded and other bond-funded projects (exception: Alabama Community College System (ACCS) PSCA-funded projects with Notice-To-Proceeds issued after July 31, 2021). Two copies of the FPC are required. Each copy of 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 (BC) No. _____ |
| | PSCA No. _____ (If applicable) |

| YES | N/A | Select "YES" or "N/A" as applicable. |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 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. |
| <input type="checkbox"/> | | Certificate of Substantial Completion, DCM Form C-13: Attach one fully-executed copy to FPC. |
| <input type="checkbox"/> | | Advertisement for Completion, DCM Form C-14: Attach one copy of the affidavit of publication (including the advertisement) to the FPC. |
| <input type="checkbox"/> | <input type="checkbox"/> | Contractor's Affidavit of Payment of Debts & Claims, DCM Form C-18: Attach one copy to FPC. |
| <input type="checkbox"/> | <input type="checkbox"/> | Contractor's Affidavit of Release of Liens, if required by Owner, DCM Form C-19: Attach one copy to the FPC. |
| <input type="checkbox"/> | <input type="checkbox"/> | 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. |
| <input type="checkbox"/> | <input type="checkbox"/> | General Contractor's Roofing Guarantee, DCM Form C-9, and Other Specified Roofing Guarantees, if any: Attached to Certificate of Substantial Completion. |
| <input type="checkbox"/> | <input type="checkbox"/> | Contractor's One-Year Warranty: Original has been delivered to the Owner. Attach one copy to the FPC. |
| <input type="checkbox"/> | <input type="checkbox"/> | Other Warranties: All other specified original warranties has been delivered to the Owner. Attach one copy to the FPC. |
| <input type="checkbox"/> | <input type="checkbox"/> | Record Documents: Specified "As-built" plans and specifications have been delivered to the Owner. |
| <input type="checkbox"/> | | O & M Manuals: Specified instructions and O&M Manuals have been delivered to the Owner. |
| <input type="checkbox"/> | <input type="checkbox"/> | Time Extension: Over-run of Contract Time has been reconciled by: <input type="checkbox"/> Change Order <input type="checkbox"/> Liquidated Damages <input type="checkbox"/> Attached explanation |
| <input type="checkbox"/> | <input type="checkbox"/> | 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 <https://appengine.egov.com/apps/al/dcm-fees> (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.



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



Kay Ivey
Governor

Kelly Butler
Director of Finance

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

January 19, 2021

TO: ARCHITECTS, ENGINEERS, AND CONTRACTORS

FROM: MICKEY ALLEN, ASSISTANT FINANCE DIRECTOR *M. Allen*
ALABAMA REAL PROPERTY MANAGEMENT (RPM)

FRANK BARNES, DIRECTOR
ALABAMA DIVISION OF CONSTRUCTION MANAGEMENT (DCM) *Frank Barnes*

SUBJECT: UPDATED GUIDANCE ON FIRE ALARM CONTRACTOR PERMITS

DCM's July 17, 2012 *Memorandum On Act 2009-657 Requiring Certification Of Fire Alarm Contractors* is superseded by this January 19, 2021 bulletin which includes updated references, terms, and details for projects under DCM's jurisdiction.

Act 2009-657, effective August 1, 2012, requires fire alarm contractors to be permitted through the State of Alabama Fire Marshal's Office. In accordance with §34-33A-9, if a fire alarm contractor is going to do work in Alabama, the contractor must deliver to the local building official a copy of their State Fire Marshal's Fire Alarm Permit. DCM requires the following:

Plan Review

For work involving fire alarm systems in Optional 65% Intermediate Plan Review submittals and in Final Plan Review submittals, the requirement for a fire alarm contractor to be permitted through the State of Alabama Fire Marshal's Office shall be included on plan notes and/or in the project manual.

Bidding

Pursuant to §34-33A-11(b), for work involving fire alarm systems, General Contractors must submit a copy of the fire alarm contractor's State Fire Marshal's Fire Alarm Permit at the same time as submission of the subcontractor and supplier list to the lead design professional, which is required within 24 hours after receipt of bids. The architect or engineer shall reject fire alarm contractors who cannot provide a copy of the required permit.

Pre-Construction Conference

For work involving fire alarm systems, General Contractors must provide a copy of the fire alarm contractor's State Fire Marshal's Fire Alarm Permit to the DCM Inspector at the pre-construction conference.

If you have any questions, please contact DCM's Plan Review Division at 334-242-4082 or planreview@realproperty.alabama.gov.

cc: Scott Pilgreen, Alabama State Fire Marshal, State of Alabama Fire Marshal's Office.



STATE OF ALABAMA
DEPARTMENT OF INSURANCE

State Fire Marshal's Office

201 Monroe Street, Suite 1790

Post Office Box 303352

Montgomery, Alabama 36130-3352

Telephone: (334) 241-4166

Facsimile: (334) 241-4158

Internet: www.firemarshal.alabama.gov

JIM L. RIDLING
COMMISSIONER

EDWARD S. PAULK
STATE FIRE MARSHAL

ROBERT BENTLEY
GOVERNOR

MAILING ADDRESS:

P.O. BOX 303352
MONTGOMERY, AL 36130-3352

OVERNIGHT ADDRESS:

201 MONROE STREET, SUITE 1790
MONTGOMERY, AL 36104
PLEASE USE FEDEX, UPS OR DHL

APPLICATION FOR STATE FIRE MARSHAL'S CERTIFIED FIRE ALARM CONTRACTOR PERMIT

PLEASE PRINT OR TYPE

In compliance with Sections 34-33A-1 to 34-33A-13, Code of Alabama, 1975, I hereby apply for a State Fire Marshal's Permit to engage in the installation, repair, alteration, maintenance, or inspection of fire alarm systems in Alabama.

CERTIFICATE HOLDER'S NAME: _____

CERTIFICATE HOLDERS SSN: _____ DOB: _____

NAME OF BUSINESS: _____

BUSINESS OWNER NAME: _____

BUSINESS OWNER SSN: _____ DOB: _____ ARE YOU A U.S. CITIZEN? ___YES ___NO

BUSINESS ADDRESS: _____

MAILING ADDRESS: _____

BUSINESS TELEPHONE: _____ PERMIT TYPE: INITIAL [] RENEWAL []
Current Permit # _____

This is to certify that _____ (certificate holder) is presently employed by _____ (business) in the capacity of _____ (title) and is authorized to act for the business in all matters pertaining to the installation, repair, alteration, addition, maintenance, or inspection of fire alarm systems in the state of Alabama.

If for any reason the certificate holder terminates employment with the above business, we the undersigned, do understand that the State Fire Marshal's Office is to be notified within thirty (30) days, and that the business will have nine (9) months or until expiration of the current permit, whichever comes first, to submit an application on a new certificate holder and be issued a new permit.

I the undersigned do certify that the information provided above is true and correct. I the undersigned do understand that submission of false information is grounds for license revocation and may subject me to criminal penalties.

Owner/President Signature _____ Date _____ Certificate Holder Signature _____ Date _____

INITIAL/RENEWAL FEE \$100.00

INCLUDE FEE WHEN SUBMITTING APPLICATION. (CHECK OR MONEY ORDER MADE PAYABLE TO THE STATE FIRE MARSHAL'S FUND.)
INCLUDE COPY OF NICET CERTIFICATION CARD (CURRENT) FOR FIRE ALARM SYSTEM TECHNICIAN - LEVEL III.

CERTIFIED FIRE ALARM CONTRACTOR ATTACHMENT

1. Home address of the NICET Certificate holder:

Street Address

City State Zip Code

Phone Number (this is the number you can be reached at)

2. Are you a United States Citizen? YES NO

3. I understand as the NICET Certificate holder for this company that I am licensed only by this company and no other company within the Fire Alarm Industry.

4. I understand as the NICET Certificate holder for this company that I am responsible for the layout, installation, maintenance, repair or alterations performed by this company.

Signature of NICET Certificate holder

Date

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, April 2020).

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) Contractor Completion Time Form for all work as indicated on drawings and specifications if document is included in the project manual.

- e. One (1) Bid Bond or certified check.
- f. One (1) Sales Tax Form.

1.5 COMPLETION TIMES

- A. The Contractor MUST state his/her completion time on their Bid Proposal Form. The Contractor's Completion Time will be taken into consideration for award of the construction contract.

1.6 DIVISION OF CONSTRUCTION MANAGEMENT USER FEES

- A. Refer to the Alabama Department of Finance, Construction Management Division Administrative Code, Chapter 355-16-1, "Collection Of User Fees" dated March 31, 2020.
 - 1. The Contractor shall include in his Base Bid Proposal all "Basic Permit Fee".
 - 2. **Do not** include the "Plan Review Fee" or the "Contract Administration Fee" in your Proposal.
 - 3. The Contractor shall be responsible for all "Re-Inspection Fees" per 355-16-1-.03 "Fees Required", (5) "Additional Fees", (b).

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 McKee & Associates, 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. Soap Dispenser, Toilet Dispensers, and Towel Dispensers.

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.

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 Board of Education ".

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. 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. **Seventy-Five Thousand Dollars (\$75,000.00)** 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. **Thirty Thousand Dollars (\$30,000.00)** as a contingency to cover cost for Concession Stand and Field House Equipment.
 - 3. **Twenty-Five Thousand Dollars (\$25,000.00)** as a contingency to cover cost for Custom Logos.

- 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: McKee & Associates, 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

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 DCM 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 (DCM Form C-13)
 - 5. Form of Advertisement for Completion (DCM Form C-14)
 - 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 CD 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 Drives. 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 with protective sleeve or case 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 Drives 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.
 - 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.
- 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 01410 – SCHEDULE OF SPECIAL INSPECTIONS

| SCHEDULE OF SPECIAL INSPECTIONS | | | | |
|--|---|---------------|---|--------------|
| Item | Inspection / Test / Certification | C or P | Extent / Comments | Agent |
| 1.00 | Fabricators | | | |
| 1.01 | Review the quality control procedures of the following fabricators for completeness and adequacy relative to the fabricator's scope of work: steel fabricator, lightgage truss fabricator, wood truss fabricator. | Periodic | AISC Certified Fabricators are exempt from the Fabricator's Quality Control Procedural Evaluation by the Special Inspector. | |
| 2.00 | Soils and Footings | | | |
| 2.01 | Verify bearing capacities of soils beneath footings. | Periodic | As recommended in approved soils report and specified in earthwork specifications. | |
| 2.03 | Verify site preparation prior to beginning fill placement. Verify fill material type, placement method, lift thickness, and compaction of fill material. Verify in-place density of compacted fill. | Periodic | As recommended in approved soils report and specified in earthwork specifications. | |
| 3.00 | Concrete Construction | | | |
| 3.01 | Spread footings are excepted from the inspections listed below. | | | |
| 3.02 | Continuous footings are excepted from the inspections listed below. | | | |
| 3.03 | Slabs on grade are excepted from the inspections listed below. | | | |
| 3.04 | Concrete foundation walls are excepted from the inspections listed below. | | | |
| 3.05 | Concrete cast on non-composite form deck is excepted from the inspections listed below. | | | |
| 3.06 | Inspect concrete formwork except as noted above for proper dimensions. Verify that construction joints are properly keyed. Verify that slab recesses, if any, have been installed. | Periodic | Prior to each pour. | |

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|-------------|---|------------|---|--|
| 3.07 | Inspect reinforcing steel except as noted above for installation including size, spacing and bar clearances. Verify that lap splices and embedment lengths are per the construction documents. Verify that dowels for work above are properly aligned and spaced to match other work. | Periodic | Prior to each pour. Verify that dowels are properly aligned and spaced to match wall reinforcement. Verify that dowel projection is adequate for proper lap splice. | |
| 3.09 | Inspect weldability of reinforcing steel other than ASTM A706. | Periodic | Prior to fabrication. | |
| 3.12 | Inspect welded reinforcement. | Periodic | Prior to pour. | |
| 3.13 | Inspect column anchor bolts | Periodic | Prior to each pour, inspect column anchor bolts to verify proper embedment, spacing, and type of anchor. | |
| 3.14 | Inspect bolts and/or headed studs to be installed in concrete prior to and during placement of concrete. | Continuous | During placement and concreting operations. | |
| 3.15 | Verify each proposed concrete mix for the project. | Periodic | For each proposed mix. | |
| 3.16 | Sample all concrete for strength tests and test concrete for slump, air content, temperature, and other tests. | Continuous | During placement operations. Reference concrete specifications for specific tests and frequencies. | |
| 3.17 | Inspect concrete placement except as noted above. | Continuous | | |
| 3.18 | Inspect all concrete curing operations as noted in the extents column. | Periodic | Monitor during hot, cold and windy conditions. Reference concrete specifications. | |
| 3.21 | Erection of precast concrete members. | Periodic | Inspect all connections. | |
| 3.23 | Verification of in-situ concrete strength prior to removal of forms and shores supporting weight of concrete. | Periodic | Prior to form or shoring removal. | |
| 3.24 | Verification of in-situ concrete strength prior to backfilling walls. | Periodic | Prior to backfilling operations. | |
| 4.00 | Masonry Construction | | | |
| 4.02 | Verification of fm' (specified compressive strength of masonry). | Periodic | Prior to construction. Additional verification for every 5,000 square feet during construction of Tornado Shelter. | |

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|-------------|--|------------------------|---|--|
| 4.03 | Inspect proportions of site prepared mortar and grout. Inspect placement of masonry units and construction of mortar joints. Inspect reinforcement for correct size and spacing. Inspect work for correct location and type of embeds and anchor bolts. Inspect work for size and location of structural elements. | Periodic | At beginning of masonry construction, prior to each new grout pour, and every 250 square feet of masonry thereafter. | |
| 4.04 | Inspect masonry cells and cleanouts prior to placement of grout. Inspect grout proportions. Inspect placement of reinforcement. | Periodic (U.N.O.) | Prior to grouting of masonry (and continuous inspection of grout space at Tornado Shelter) | |
| 4.05 | Inspect grouting operations to ensure compliance with code and construction documents. Inspect placement of all grout. | Continuous | During grouting. | |
| 4.08 | Inspect type size and location of anchors, including details of anchorage of masonry to structural members, frames or other construction. | Continuous | During installation of anchors at Tornado Shelter. | |
| 4.10 | Inspect welding of reinforcing bars. | Continuous | During installation and welding of all reinforcing. | |
| 4.11 | Inspect protection of masonry during cold weather and hot weather. | Periodic | During periods with temperatures below 40 degrees or above 90 degrees. | |
| 4.12 | Inspect preparation of grout specimens, mortar specimens and / or prisms. | Continuous | During preparation of all specimens. | |
| 4.13 | Verify compliance with all required inspection provisions of the construction documents and approved submittals. | Periodic | As required for duration of project. | |
| 5.00 | Steel Construction | | | |
| | Inspection of the steel pieces | | | |
| | Inspection of frame | | | |
| 5.01 | Inspect high-strength bolts, nuts and washers: a. Identify markings to conform to ASTM standards specified in the construction documents. b. Inspect manufacturer's certificate of compliance. | Periodic | Reference project specifications and ASTM material specifications; AISC 335, (Sect A3.4); AISC LRFD (Sect A3.3). | |
| 5.02 | Inspect high-strength bolting: Snug-tight Bearing-type connections (non-pretensioned) | Periodic | | |
| 5.03 | Inspect high-strength bolting: Pretensioned connections (along with applicable pre-installation calibration procedures). | Periodic or Continuous | Continuous monitoring required for pretensioning using calibrated wrench method or turn-of-nut method without matchmarking. | |

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|-------------|---|------------|--|--|
| 5.04 | Inspect and verify structural steel material: a. Identification markings to conform to ASTM standards specified in the approved construction documents. b. Manufacturers' certified mill test reports. | Periodic | Confirm that materials meet applicable ASTM specifications noted in construction documents. | |
| 5.05 | Inspect and verify weld filler materials: a. Identification markings to conform to AWS specification in the approved construction documents. b. Manufacturer's certificate of compliance required. | Periodic | Confirm that materials meet applicable ASTM specifications noted in construction documents. | |
| 5.06 | Inspect welding: Structural Steel: 1) Complete and partial penetration groove 2) Multipass fillet welds. 3) Single-pass fillet welds > 5/16" | Continuous | Per specifications and AWS D1.1 | |
| 5.07 | Inspect welding: Structural Steel: 1) Single-pass fillet welds ≤ 5/16" 2) Floor and deck welds. 3) Welded studs used for diaphragm. 4) Sheet steel for cold-formed framing. 5) Stairs and railings. | Periodic | Per specifications and AWS D1.1 | |
| 5.08 | Roof and Floor deck: Inspect attachment of deck to supporting members. | Periodic | Prior to concrete or roofing being installed. | |
| 5.09 | Inspect steel frame joint details for compliance with approved construction documents (including addenda): a. Details such as bracing and stiffening. b. Member locations. c. Application of joint details at each connection. | Periodic | Inspect complete frame. | |
| 6.00 | Wood | | | |
| 6.01 | Inspect fabricated wood trusses and shop built components. | Periodic | Inspect truss production in shop unless fabricator is approved by building official and submits certification of compliance at end of scope of work. | |
| 6.02 | Inspect site-built assemblies. Inspect erected trusses including bridging and attachments. | Periodic | Inspect erected trusses and installation of bridging. | |
| 6.03 | Inspect plywood roof diaphragms. | Periodic | Inspect all diaphragms after rough carpentry is complete, including required nail attachment. | |
| 6.04 | Inspect installation and anchorage of wood trusses. | Periodic | Verify all bracing required by truss manufacturer as well as permanent 'X'-bracing as shown on contract drawings. Verify anchorage per contract drawings and manufacturer's recommendations. | |

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|-------------|---|----------|---|--|
| 7.00 | Architectural / MEP Components | | | |
| 7.04 | Verify application of sprayed fire-resistant materials. | | | |
| 7.08 | Inspect EIFS applications. | | | |
| 7.10 | Test smoke control systems. | | | |
| 9.00 | Special Inspections for Seismic Resistance Seismic Force-Resisting System(s) and/or Designated Seismic Systems: | | See General Notes on Sheet S0.1 of structural drawings. | |
| 9.02 | Inspect nailing, bolting, anchoring and other fastening of components within the seismic-force-resisting system including drag-struts, braces and hold-downs. | Periodic | | |
| 9.06 | Inspect anchorage of access floors and storage racks 8 feet or greater in height. | Periodic | | |
| 9.07 | Inspect erection and fastening of exterior cladding and interior and exterior veneer. | Periodic | | |
| 9.08 | Inspect erection and fastening of all non-load bearing walls. | Periodic | | |
| 9.09 | Inspect mechanical and electrical components per 1707.7 as determined by MEP designer(s). | Periodic | | |
| 9.18 | Review certified mill test reports of all concrete reinforcing. | | | |

| INSPECTION AGENTS | |
|--------------------------|--------------------------|
| # | Firm, Address, Telephone |
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Note: The inspection and testing agent(s) shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official prior to commencing work. The qualifications of the Inspection Agent(s) may be subject to the approval of the Building Official.

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

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

Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

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

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 02100 - SITE PREPARATION

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

- B. Perform site preparation work as shown and specified. Site preparation includes, but is not limited to the following:
 1. Protection of existing trees to remain
 2. Removal of trees and other vegetation.
 3. Stripping and stockpiling of topsoil.
 4. Clearing and grubbing.
 5. Removing above grade improvements.
 6. Removing below grade improvements.
 7. Installation of erosion control devices.

1.3 JOB CONDITIONS

- A. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing. Leave all protection in place and maintain until construction work has been completed and all danger of damage has passed. Protection shall be removed only after approval is given by Architect.

1.4 QUALITY ASSURANCE

- A. **The General Contractor shall obtain (*In accordance with ADEM Admin. Code Chapter 335-6-12*) an ADEM storm water permit from the State of Alabama. An NPDES construction site also includes construction sites, irrespective of size, whose stormwater discharges have a reasonable potential to be a significant contributor of pollutants to a water of the State, or whose stormwater discharges have a reasonable potential to cause or contribute to a violation of an applicable Alabama water quality standard as determined by the Department. The General Contractor shall include in Base Bid all permit fees associated to obtain this permit. The Contractor shall submit a Notice of Registration, the fee and develop a Construction Best Management Practices Plan (CBMPP) prior to construction and shall maintain all erosion control measures until the permit is relinquished.**

{Use Paragraphs below only if owner has obtained Permit}

- A. **The Owner has obtained (*In accordance with ADEM Admin. Code Chapter 335-6-12*) an ADEM storm water permit from the State of Alabama. The Owner has submitted a Notice of Registration, the fee and developed a Construction Best Management Practices Plan (CBMPP) prior to construction. An NPDES construction site also includes construction sites, irrespective of size, whose stormwater discharges have a reasonable potential to be a significant contributor of pollutants to a water of the State, or whose stormwater discharges have a reasonable potential to cause or contribute to a violation of an applicable Alabama water quality standard as determined by the Department.**
- B. **This permit shall be transferred into the General Contractors name upon award of the contract and this contractor will be responsible for installation and maintenance of erosion control including maintenance of the erosion control structures. The Contractor shall use care when working near existing and future installed Best Management Practice (BMP) structures to prevent damage to the structures resulting in erosion and storm water runoff**

containing silt and soil from the site. The Contractor shall walk the site and verify the condition of the BMP structures during the execution of the work. Any repair work that is deemed necessary as a result of damage caused by the Contractor shall be the responsibility of the Contractor, and shall be performed prior to payment of the next scheduled payment application.

- C. The Contractor shall use care when working near existing and future installed Best Management Practice (BMP) structures to prevent damage to the structures resulting in erosion and storm water runoff containing silt and soil from the site. The Contractor shall walk the site and verify the condition of the BMP structures during the execution of the work. Any repair work that is deemed necessary as a result of damage caused by the Contractor shall be the responsibility of the Contractor and shall be performed prior to payment of the next scheduled payment application.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Temporary Soil Erosion and Sediment Control Items: Items including silt fence, wattles, inlet protection, sand bags and other erosion control items are to meet the requirements of Section 665 of the Alabama Department of Transportation Standard Specifications for Highway Construction (ALDOTSSH), latest edition.

PART 3 - EXECUTION

3.1 EROSION CONTROL

- A. Prior to the starting of any work, install erosion control measures as required in the Erosion Control or Best Management Practice Plan. Maintain all erosion control measures in place during full construction period and until such time as the site is substantially vegetated. Install erosion control measures in accordance with Section 665 of the Alabama Department of Transportation Standard Specifications for Highway Construction (ALDOTSSH), latest edition, and the manufacturer's recommendations. Inspection of the silt fence shall be daily, and repair or replacement must be made promptly as required. Any sediment collected by the erosion control measures must be removed when it reaches 6" in height. Erosion control measures shall be removed only after approval is given by the Architect. Removal of erosion control measures is to be carried out by the Contractor who installed the measures.

3.2 SITE CLEARING

- A. General: Remove vegetation, improvements or obstructions interfering with installation of new construction and within limits indicated on the Drawings. Remove all demolished items from the site. Removal includes digging out stumps and roots. Carefully and cleanly cut roots and branches of trees indicated to be left standing where such roots and branches obstruct new construction.
- B. Clearing and Grubbing: Clear site of trees, shrubs and other vegetation, except for those indicated to be left standing. Completely remove stumps, roots and other debris protruding through ground surface. Do not grub inside the drip line of trees to remain. On site burning is not permitted.
- C. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated. Place fill material in horizontal layers not exceeding 8" loose depth and thoroughly compact to a density equal to adjacent original ground.
- D. Positive drainage must be maintained or installed by the Contractor to insure that storm water runoff flows to the proper drainage structure or swale.
- E. Restore all areas disturbed by construction activities and which are outside the limits of clearing as indicated on the drawing to their original condition. The expense for this work will be borne by the contractor. The work must be in accordance with the directions of the Architect.

3.3 STRIPPING TOPSOIL

- A. Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4". Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones and other objects over 2" in diameter, and without weeds, roots and other objectionable material. Strip topsoil to its full depth at all areas to be regraded, resurfaced or paved in a manner to prevent intermingling with underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping. Where trees are indicated to be left standing, stop topsoil stripping at drip line, unless directed otherwise, to prevent damage to main root system. Stockpile topsoil in storage piles in a location acceptable to the Architect. Construct storage piles to freely drain surface water. Cover storage piles if required to prevent wind-blown dust. Maintain topsoil storage piles separate from other stockpiled soil materials.

3.4 SITE IMPROVEMENTS

- A. Remove above grade and below grade improvements necessary to permit construction, and other work as indicated. Abandonment or removal of certain underground pipe or conduits are shown on the civil drawings and is included under work of those sections. Removal of abandoned underground piping or conduit interfering with construction is included under this section.

3.5 DISPOSAL OF WASTE MATERIAL

- A. Removal from Owner's Property: Remove waste materials, including unacceptable excavated materials, trash and debris, and legally dispose of it off Owner's property site, in area approved by all local authorities and ADEM.

END OF SECTION

SECTION 02200 – EARTHWORK

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.
- B. Geotechnical Report is included at the end of this section and is an integral part of this specification.**

1.2 DESCRIPTION OF WORK

- A. Extent of earthwork is indicated on drawings.
 - 1. Rough grading
 - 2. Preparation of subgrade for building slabs and walks is included as part of this work.
 - 3. Drainage fill course for support of building slabs is included as part of this work.
- B. Excavation for Mechanical/Electrical Work: Refer to Division 15 and 16 sections for excavation and backfill required in conjunction with underground mechanical and electrical utilities and buried mechanical and electrical appurtenances; not work of this section.
- C. Codes and Standards: Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.
- D. Testing and Inspection Service:
- E. The **Owner** will select a firm for soil testing and inspection service for quality control testing during earthwork, and Owner to pay costs.
- F. Retesting of rejected materials and installed work shall be done at the Contractor's expense.
- G. 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.

1.3 JOB CONDITIONS

- A. Existing Utilities: Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
- B. Should uncharted or incorrectly charted, piping or other utilities be encountered during excavation, consult utility Owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
- C. Use of Explosives: The use of explosives is not permitted.
- D. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
 - 1. Perform excavation within drip-line of large trees to remain by hand and protect the root system from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

PART 2 – PRODUCTS [NOT APPLICABLE]

PART 3 - EXECUTION

3.1 GENERAL

- A. Prior to the start of excavation and fill placement, the site should be cleared of existing improvements. Additionally, remnant elements associated with previously demolished structures, should be removed. Demolition should include removal of pavements, slabs, and all below grade structures including basement slabs, foundations, and walls. Utility lines will require routing or removal, as appropriate.
- B. Any existing fill materials that are encountered in the planned building area should be completely removed, plus 10 feet beyond.
- C. Areas that are at final grade, or that will require new fill placement, should be evaluated through proofrolling, prior to new fill placement or construction.
- D. Vegetation, topsoil, rootmat, and all organic materials should be completely removed from the site. Excavations resulting from demolition and vegetation removal should be backfilled in a controlled manner with engineered fill.

3.2 FILL PLACEMENT

- A. All material used as structural fill should be relatively free of organics and other deleterious materials. Soil fill should exhibit a Liquid Limit less than 50, a Plasticity Index less than 30, and a maximum dry density of at least 100 pcf. Soil fill should contain no more than 30% rock, and individual rock fragments in the fill should be less than 4 inches in largest dimension.
- B. Soil fill must be placed in an environment free of excess water. Therefore, free-draining granular material (such as ALDOT # 57 crushed aggregate) should be used as the initial lift(s) of fill in areas containing water seepage.
- C. Soil fill should be placed in lifts not exceeding eight inches in loose measure. Individual lifts of fill should be moisture conditioned to within $\pm 2\%$ of the optimum moisture content and compacted to a minimum of 98% of the Standard Proctor (ASTM D -698) maximum dry density.
- D. Soil may require wetting or drying to achieve proper compaction. Thinner lifts and manually operated equipment will be required to achieve proper compaction in limited access areas such as utility trenches and around manholes and inlets.
- E. Soil compaction testing should be performed during fill placement. Testing will give an indication of the contractor's performance with regard to soil density and moisture content requirements established in the project specifications. Compaction testing should be performed at random locations on each lift of fill placed to provide statistically relevant testing data. The frequency of density testing should be at least one test per lift for every 2,500 square feet of fill placed in building areas and 10,000 square feet in pavement and sidewalk areas (minimum of 3 tests per lift). Each lift of fill placed in utility trenches should be tested on 50-foot centers. A minimum of 3 tests should be performed on all fill lifts.
- F. Following construction, the foundations and underlying soils should be isolated from sources of excess water. Grades adjacent to the structure should be adjusted so that surface water flows away from the foundations. In no case should water be allowed to pond over newly-constructed footings. Roof drains and downspouts from the new buildings should be directed away from the foundations. Additionally, soils adjacent to foundations should consist of properly compacted, engineered fill to minimize water infiltration. The on-site soils contained fine-grained particles and will be adversely affected by excess water.
- G. To reduce the potential for water migration through the floor slab, ground-supported slabs should be underlain by a capillary break consisting of a minimum of 4 inches of compacted, free-draining, coarse, granular material (such as ALDOT #57 crushed stone). Depending on the type of floor coverings to be used, the owner may also elect to install a vapor barrier typically consisting of 10 mil polyethylene sheeting. The sheeting will reduce the infiltration of water vapor through the slab and the potential for damage to floor coverings. Note, that the use of a vapor barrier will increase the potential for plastic shrinkage cracking during curing of the concrete slab.

3.3 EXCAVATION

- A. Excavation is Unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.
- B. Earth Excavation includes excavation of pavements and other obstructions visible on ground surface; underground structures, utilities and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation.
- C. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect/Engineer. Unauthorized excavation, as well as remedial work directed by Architect/Engineer, shall be at Contractor's expense.
- D. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to Architect/Engineer.
- E. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Architect/Engineer.
- F. Additional Excavation: When excavation has reached required sub-grade elevations, notify Architect/Engineer who will make an inspection of conditions.
- G. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by Architect/Engineer.
- H. Removal of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in work.
- I. Stability of Excavations: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.
- J. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- K. Dewatering: See civil drawings for drainage plan recommendation for controlling ground water during initial construction phase. Prevent surface water from flowing into excavations and from flooding project site and surrounding area.
- L. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
- M. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.
- N. Material Storage: Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
- O. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
- P. Dispose of excess soil material and waste materials as herein specified.
- Q. Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10', and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
- R. In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.

- S. Excavation for Pavements: Cut surface under pavements to comply with cross-sections, elevations and grades as shown.
- T. Excavation for Trenches: Dig trenches to the uniform width required for particular item to be installed, sufficiently wide to provide ample working room. Provide 6" to 9" clearance on both sides of pipe or conduit. Excavate trenches to depth indicated or required. Carry depth of trenches for piping to establish indicated flow lines and invert elevations.
- U. Where rock is encountered, carry excavation 6" below required elevation and backfill with a 6" layer of crushed stone or gravel prior to installation of pipe.
- V. Except as otherwise indicated, excavate for exterior waterbearing piping (water, steam, condensate, drainage) so top of piping is not less than 2'-6" below finished grade.
- W. Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.
- X. Backfill trenches with concrete where trench excavations pass within 18" of column or wall footings and which are carried below bottom of such footings, or which pass under wall footings. Place concrete to level of bottom of adjacent footing.
 - 1. Concrete is specified in Division 3.
- Y. Do not backfill trenches until tests and inspections have been made and backfilling authorized by Architect/Engineer. Use care in backfilling to avoid damage or displacement of pipe systems.
- Z. Excavation for utilities shall conform to manufacturer's recommendations for the type material used.
- AA. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

3.4 COMPACTION

- A. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.
- B. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density for soils which exhibit a well-defined moisture density relationship (cohesive soils) determined in accordance with ASTM D 698; and not less than the following percentages of relative density determined in accordance with ASTM D 2049, for soils which will not exhibit a well-defined moisture-density relationship (cohesionless soils).
 - 1. Structures, Building Slabs and Steps and Pavements: Compact top 6" of subgrade and each layer of backfill (not exceeding 8" maximum) or fill material to not less than 98% of maximum density.
 - 2. Lawn or Unpaved Areas: Compact top 6" of subgrade and each layer or backfill or fill material to not less than 90% of maximum density for cohesive soils and 90% of relative density for cohesionless soils.
 - 3. Walkways: Compact top 6" of subgrade and each layer of backfill or fill material to not less than 95% of maximum density.
- C. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.
- D. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
 - 1. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory value.

3.5 BACKFILL AND FILL

- A. General: Place acceptable soil material in layers to required subgrade elevations, for each area

classification listed below.

1. Utility Trenches backfill according to manufacturer's recommendation for the type material used.
 2. In excavations, use satisfactory excavated or borrow material.
 3. Under grassed areas, use satisfactory excavated or borrow material.
 4. Under structures, building slabs, steps and pavements and after grading operations, thoroughly mix top 6" of subgrade and compact to a density not less than 98% of maximum density.
 5. Under walks and pavements, use satisfactory excavated or borrow material, or combination of both.
 6. Under building slabs, use drainage fill material.
- B. Backfill excavations as promptly as work permits, but not until completion of the following:
1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
 2. Inspection, testing, approval, and recording locations of underground utilities.
 3. Removal of concrete formwork.
 4. Removal of trash and debris.
- C. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
- D. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.
- E. Placement and Compaction: Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment, and not more than 4" in loose depth for material compacted by hand-operated tampers.
- F. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
- G. Place backfill and fill materials evenly adjacent to structures, piping or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping or conduit to approximately same elevation in each lift.

3.6 GRADING

- A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.
- B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding.
- C. Finish surfaces free from irregular surface changes, and as follows:
1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.2' above or below required subgrade elevations.
 2. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10' above or below required subgrade elevation.

3. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 0.10' above or below required subgrade elevation.
- D. Grading Surface or Fill under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2" when tested with a 10' straightedge.
- E. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

3.7 BUILDING SLAB DRAINAGE COURSE

- A. General: Drainage course consists of placement of drainage fill material, in layers of indicated thickness, over subgrade surface to support concrete building slabs.
- B. Placing: Place drainage fill material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting material during placement operations.
- C. When a compacted drainage course is shown to be 6" thick or less, place material in a single layer. When shown to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

3.8 FIELD QUALITY CONTROL

- A. Quality Control Testing During Construction: Allow approved testing laboratory to inspect and approve subgrades and fill layers before further construction work is performed.
 1. Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ASTM D 2167 (rubber balloon method), or ASTM D 2922 (nuclear method) as applicable.
 2. Footing Subgrade: For each strata of soil on which footings will be placed, conduct at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to Architect/Engineer.
 3. Paved Areas Subgrade: Make at least one field density test of subgrade for every 10,000 sq. ft. of paved area, but in no case less than 2 tests. In each compacted fill layer, make one field density test for every 10,000 sq. ft. of overlaying paved area, but in no case less than 2 tests
 4. Building Slab Subgrade: Make at least one field density test of subgrade for every 2500 sq. ft. of paved area or building slab, but in no case less than 2 tests. In each compacted fill layer, make one field density test for every 2500 sq. ft. of overlaying building slab or paved area, but in no case less than 2 tests.
 5. Foundation Wall Backfill: Take at least 2 field density tests, at locations and elevations as directed.
- B. If in opinion of Architect/Engineer, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense.

3.9 MAINTENANCE

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.
- D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work and eliminate evidence of restoration to greatest extent possible.

3.10 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Removal from Owner's Property: Remove waste materials, including unacceptable excavated materials, trash and debris, and legally dispose of it off Owner's property site, in area approved by all local authorities and ADEM.

END OF SECTION



~ Geotechnical Evaluations ~ Construction Materials Testing ~ Geosciences ~ Infrastructure Management Services ~

**SOILS EXPLORATIONS AND GEOTECHNICAL
ENGINEERING STUDIES FOR THE PROPOSED
NEW SOFTBALL FIELD AT DAPHNE HIGH SCHOOL
DAPHNE, ALABAMA**

Professional Services Since 1974

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Geotechnical Engineering-Testing, Inc.

PROFESSIONAL ENGINEERS

Geotechnical Evaluations - Geosciences - Construction Materials - Pavement Management

June 3, 2024

Frank Boatwright
Baldwin County Board of Education
2600-A North Hand Ave.
Bay Minette, AL 36507

Email: fboatwright1@bcbe.org

Re: New Softball Field at Daphne High School in Daphne, AL

Dear Mr. Boatwright:

Geotechnical Engineering-Testing, Inc. (GET) is pleased to submit this report of our soils explorations and geotechnical engineering evaluations for the proposed design and construction of the new softball field for Daphne High School in Daphne, Alabama. This report includes the results of the soils explorations program and our recommendations for site preparations, design and construction of building foundations for the currently planned structures, and the design and construction of parking and drive pavements.

The recommendations provided in the attached report are based in part on the project information provided to GET and only apply to the specific project and site discussed in the report.

Please call Curt Doyle, P.E. if you have any questions regarding this report.

Sincerely,

GEOTECHNICAL ENGINEERING-TESTING, INC.



Curt Doyle, P.E.
Principal Engineer
Alabama License No. 25733
Date: 6/03/2024



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HIGHWAY LOCATION MAP

Figure 1

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B

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INTRODUCTION

Geotechnical Engineering-Testing, Inc. (GET) has completed the authorized soils explorations and geotechnical engineering studies for a proposed New Softball Complex at Daphne High School located at 9300 Champions Way, Daphne, AL. The soils explorations for this project have included 23 exploratory soil test borings, visual descriptions of the soils encountered, and laboratory tests on selected soil samples. The engineering study has included the planning, coordination, and supervision of the soils explorations program, evaluations of the results of the soils explorations, and development of recommendations for site preparation, buildings, light pole foundations, and drive and parking areas throughout the school's campus.

The project consists of a new softball field and accompanying structures. Preliminary plans indicate that a metal-framed grandstand will be constructed on a concrete slab-on-grade with turn down footings. The slab will be approximately 68 ft long in the northwest-southeast direction and 38 ft wide. The accompanying proposed concession stand/restroom building and dug outs will be constructed on square column footings. The home team dugout will have an attached locker room and is located on the south side of the field, the dugout is about 50 ft long in the east-west direction and 15 ft wide. The attached locker room is offset by approximately 18 ft to the east and has the approximate dimensions of 50 ft long by 33 ft wide. The visitor dugout building will be on the east side of the field and will have the approximate dimensions of 40 ft long in the north-south direction by 15 ft wide. The planned covered batting shelter is located on the south side of the field east of the planned home team dug out/locker room. The dimensions of the batting shelter is approximately 60 ft by 60 ft. Preliminary drawings indicate that foundations for the batting shelter will be 3 ft diameter piers installed 4.33 ft below finished grade. The drawings indicate that four high mast light poles will be constructed around the perimeter of the field and a scoreboard that will be constructed behind the outfield fence.

In addition to the proposed softball field and related structures, several new paved drives and parking area are planned. These paved portions extend east from the front of the existing school building to the planned softball field extending south to the current tree line.

Details of our findings and recommendations are presented in the following sections of this report.

SITE DESCRIPTION

The proposed project site is generally located on the east side of the grounds/property of the high school; bounded by Champions Way to the north, Innovation Way to the East and County Road 13 to the west. The new softball field and ancillary structures will be constructed in an area that has recently been used for agriculture crops. A Highway Location Map showing the general location of the proposed project is provided in Figure 1 of this report.

General Site Description

The proposed construction site for the proposed softball field is generally contained in a relatively open field. At the time of our field explorations, the open areas were generally relatively flat, but were soft, wet, and poorly drained. The areas where the proposed paved drives and parking lots are planned were firm but wet and poorly drained.

SOILS EXPLORATIONS PROGRAM

The procedures for the field exploration and laboratory testing programs utilized on this project are summarized in the following sections of this report.

Boring Locations

The 23 soil test borings performed for this project were selected by GET personnel based on the drawings provided by the project architect, Mr. Jacky Barganier with McKee & Associates Architects, Inc. on May 13, 2024. Boring locations were established in the field by using a sub-meter GPS unit based upon state plane coordinates indicated on AutoCAD files provided by the project civil engineer, Sawgrass. Approximate soil boring locations are shown on the Boring Location Plan in Appendix A.

Field Explorations

The soils explorations for this project included performing a total of 8 deep soil test borings in the area of the new baseball field. The borings were made with a truck-mounted SIMCO-2800 drill rig. The boreholes were advanced using solid-stem augers. Standard penetration tests were performed, and split spoon soil samples were collected continuously to a depth of 10 ft, at 2 ft center-to-center

intervals from 10 ft to 15 ft, and then at 5 ft center-to-center intervals to the boring termination depths.

Within the planned access drives, 15 shallow auger borings were performed. At each boring location, the borings were advanced with an approximate 3-inch diameter, bucket-type hand auger. Soil borings were advanced to a depth of about 5 to 6 ft below ground surface except where auger refusal was met. Soil samples were collected at each strata change as visually determined in the field.

Boring and sampling operations were conducted in general accordance with standard procedures. Depths where samples were collected and the results of the standard penetration tests are shown on the Logs of Boring included in Appendix B of this report.

Split spoon and grab samples collected during the boring operations were visually described, logged, placed in moisture tight plastic bags, and along with the sealed tube samples, and transported to the laboratory. At the laboratory, all samples were visually examined by a senior technician to confirm or adjust field classifications.

Laboratory Testing

The laboratory testing program included performing physical laboratory soil mechanics tests on selected soil samples that were recovered from the borings. The tests included moisture content, Atterberg limits, percent passing the #200 sieve, dry unit weight determination, and unconfined shear tests. Test results are shown on the Logs of Boring opposite the respective samples tested. Tests were performed in general accordance with applicable laboratory soil testing standards and laboratory test results and test reports have been included in Appendix C of this report.

SUBSURFACE CONDITIONS

Subsurface conditions encountered during the soils exploration program are summarized in the following sections.

Subsurface Soils

In the area of the planned softball field and facilities 8 deep soil test borings were performed, B-101 through B-108. The soil test borings generally encountered about 5 inches of topsoil underlain by about 6 ft of soft sandy clay soils. Below the soft clay layer, a stiff to very stiff sandy clay is encountered to approximately 14 ft below ground surface level. Underlying the upper clay soils, a layer of loose to firm silty sand was encountered to a depth of about 30 ft or boring termination depth.

In the area of the planned paved parking and drives the 15 shallow soil test borings, borings HA-1 through HA-15, generally encountered sandy clays and clayey sands throughout the borings.

The soil boring logs provided with this report are representative of subsurface conditions at their respective locations and for their respective vertical reaches. However, local variations characteristic of the subsurface materials of the region may be encountered during construction. The boring logs and related information are based on the driller's logs and visual examination of soil samples in the laboratory. The delineation between soil types shown on the logs is approximate and the description represents the interpretation of subsurface conditions at the designated boring location on the date drilled.

Groundwater was not encountered in the soil test borings. However, fluctuations in water table levels should be anticipated throughout the year. It should be anticipated that water will become temporarily perched above the upper clay soils following rain events. Absence of groundwater data on borings implies that no data is available but does not necessarily mean that groundwater will not be encountered at these locations or within the vertical reaches of these borings in the future.

GEOTECHNICAL RECOMMENDATIONS

The recommendations provided below are based upon our understanding of the project as described above, the subsurface data collected, our engineering evaluations regarding the geotechnical matters, and our past experience on projects in proximity to this site and the typical climate conditions of the area. If our understanding of the project is incorrect, we should be provided accurate information and should be provided the opportunity to review our recommendations taking into consideration the new project information.

General Geotechnical Site Preparation (Building Areas)

Below are some general guidelines and recommendations for site preparations. The means and methods of construction will be the responsibility of the contractor.

- Clear the proposed construction areas; these operations are anticipated to remove all deleterious items that cover the site such as organics, trees, debris, concrete, etc. The clearing activities should extend a minimum 5 ft outside the building/structure footprints.
- Where required by the Grading Plan, cut to subgrade elevation. Cohesive subgrade soils generally should not require modification and be left undisturbed as practical. However, the subgrade soils may consist of granular soils as well as cohesive soils. Modification of the granular soils will generally be required. Therefore, the subgrade soils should be inspected by a representative of the geotechnical engineer and if any soft/loose soils are observed, they should be modified in general accordance with the guidelines below.
- If cohesive subgrade soils become disturbed, the cohesive soils should be removed and replaced with granular backfill soils placed and compacted as recommended below. Disturbed granular subgrade soils should be compacted to at least 100 percent standard Proctor density (SPD) (ASTM D 698) for a minimum of at least 8 inches or to the satisfaction of the geotechnical engineer or a representative of the geotechnical engineer. The moisture content must be maintained within +/- 2 percent of optimum moisture content.
- Where applicable, the subgrade soils (silty and clayey soils) may contain significant amounts of fines and are moisture sensitive. If even slightly above optimum moisture content, rubber tire equipment may disturb and/or rut the soils. Rubber tire equipment should be prohibited, to the extent practical, from trafficking on undisturbed or prepared

subgrade soils. If disturbed, additional undercutting may be required.

- The undisturbed and/or compacted subgrade soils should be proof rolled and monitored by a representative of the geotechnical engineer of record. Soft/loose areas identified shall be overexcavated and backfilled in compacted lifts.
- Where backfill/fill soils will be required within the proposed building/structure areas, these materials should be non-plastic soils that are free of organics or deleterious materials with no more than about 20 percent passing a #200 sieve.
- Backfill/fill soils within the building/structure areas should be placed on undisturbed or re-compacted in-situ soils. They should be placed in loose lifts no thicker than 8 inches and each lift should be compacted to at least 95 percent SPD. The moisture content must be maintained within +/- 2 percent of optimum moisture content.
- Representative samples of the backfill/fill soils and/or insitu subgrade soils should be collected for classification and laboratory Proctor density testing. The maximum dry density, optimum moisture content, gradation, and plasticity should be determined. These tests are needed for quality control of the compacted fill. Field density tests should be performed on the insitu subgrade and/or compacted back/fill soils. One test should be performed for each 2500 square feet of general fill area per lift of backfill/fill soils or base materials.
- Where crushed aggregate will be required for this project, such as the paved areas, we recommend a crushed aggregate base (ALDOT 825 B) placed in lifts no thicker than 6 inches. Each lift should be compacted to at least 100 percent modified Proctor density.

General Foundation Recommendations

A variety of foundations are anticipated for this project. These include monolithic concrete slab-on-grade with turn down footings, isolated columns footings, pier, and pole foundations. Below are our general guidelines and recommendations for foundation and field soil preparation. The means and methods of construction will be the responsibility of the contractor.

- After footing excavations have been undercut to design grades, we recommend a representative of the Geotechnical Engineer of Record probe the bottom of footing. If soft/loose spots are observed along the bottom of footings additional undercutting and compaction efforts may be required. If undercutting is required, the width of the undercut

shall be 6-inches on each side of the footing for every 1 ft of undercut.

- Shallow foundations should bear directly and continuously on the prepared granular and/or undisturbed cohesive soils, and should be designed based upon the allowable bearing capacities presented below. The geotechnical engineer of record should be contacted if dissimilar bearing soil conditions are exposed beneath foundation areas.
- Shallow foundations should be designed with a minimum depth of embedment (bottom of footing below adjacent exterior finished grade) of 2 ft.
- In order to prevent localized shear failure of the bearing soils, individual and strip footings should have minimum footing widths of 2 ft. Even though the recommended average soil bearing pressure may not be achieved, these minimum width recommendations should control the size of the foundations.
- If unusual or questionable soil bearing conditions are encountered while performing foundation excavations, the geotechnical engineer of record should be contacted for appropriate recommendations.
- If the bottoms of the footing excavations and slab foundations are within stiffer cohesive soils, these soils should be left undisturbed as practical. Soft or medium consistency cohesive foundation soils, as determined by a representative of the geotechnical engineer, should be removed. We recommend that undercut excavations be backfilled with compacted crushed aggregate. An alternative to compacted crushed aggregate would be to thicken the concrete footing or pour a lean concrete mud seal in accord with recommendations by the structural engineer.
- Field density tests should be performed every 50 feet along the bottom of wall footings and at the bottom of each column footing.
- Foundation excavation bottoms should be level or suitably benched, and free of any loose soils that have been disturbed by seepage or the construction process. Loosened bearing soils should be recompacted prior to placement of reinforcing steel. The foundation excavation bottoms should be stable under the weight of construction equipment and personnel.
- Shallow foundation construction should occur in the dry. Foundation excavations should be cut to final grade and footings constructed as soon as possible to minimize potential damage to bearing soils as result of exposure to the environment.

- Shallow foundations may be cast directly against the exposed, vertical and horizontal, excavation faces.
- Excavations within compacted granular soils should be expected to remain vertical and stable while open only for short periods of time. Excavation collapse due to rainfall or other on-site activities should be repaired to design bearing level prior to reinforcing steel placement.

Involvement of GET geotechnical engineers and technician personnel during site work activities will help to verify that procedures and results are as recommended and as anticipated. Inadequate construction procedures or test results identified during this process should be addressed by the geotechnical engineer of record.

Concession/Restroom, Dugouts, and Grandstands Building Foundations

Shallow foundations should be suitable for supporting the loads of the proposed buildings. The finished floor elevation (FFE) of the Dugout is about elevation +187.90. The FFE of the concession/restroom and Grandstands buildings are unknown at this time. However, we assume the grades and elevations from the other structures to be constructed near the existing grade. Therefore, we assume the final grade/finished floor elevation for the home concession/restroom building and grandstands to be about elevation +187 ft. After footing excavations have been undercut to design grades and prepared as noted above in the General Foundation Preparation Recommendations section and as noted below, we recommend a representative of the geotechnical engineer of record probe the bottom of footing. If soft/loose spots are observed along the bottom of footings additional undercutting and compaction efforts may be required.

For this project, we recommend that foundations be designed to bear at least 2 ft below the lowest adjacent final grade. We further recommend that load-bearing wall foundations have a minimum width of 2 ft and column foundations have a minimum width of 3 ft. If these site preparation and foundation design recommendations are followed, a square foundation may be designed based upon an allowable bearing pressure of 1500 psf. If higher allowable bearing pressures are needed, please contact us for further evaluations and consultation.

Factor of Safety and Short-Term Settlement

The allowable foundation bearing pressure values presented above for the buildings and grandstands are based on a factor of safety of approximately 3.0 against bearing capacity failure. For the pressures stated, short-term foundation settlement should be less than 1 inch. It should be noted that the allowable bearing pressure recommended for some foundation widths/depths is based on limiting short-term settlement to less than 1 inch (bearing pressure based on bearing capacity failure would be greater).

Long-Term Settlement

Based upon our explorations and minimal amount of fill soils required based on elevations in project drawings, we do not anticipate long-term settlement based on the soil conditions and the information provided at this time.

Batting Shelter Foundations

The drawings show that the batting shelter columns are to be supported on individual pier foundations. The pier foundation dimensions according to the preliminary drawings are 3 ft diameter and are to be imbedded 4.33 ft below the final grade. If properly excavated and free from debris, pier foundations should provide the following allowable capacities based on a factor of safety of 3.

| Pier Foundation Capacities (Tons) | | | | | | |
|--|---------------|-------------|-----------------|-------------|---------------|-------------|
| | 3 Ft Diameter | | 3.5 Ft Diameter | | 4 Ft Diameter | |
| Depth (ft) | Uplift | Compression | Uplift | Compression | Uplift | Compression |
| 3 | 1.3 | 8.0 | 1.5 | 10.5 | 1.8 | 13.4 |
| 4 | 1.8 | 8.5 | 2.1 | 11.2 | 2.4 | 14.1 |
| 5 | 2.2 | 9.1 | 2.6 | 11.9 | 2.9 | 14.5 |
| 6 | 2.6 | 9.7 | 3.1 | 12.3 | 3.5 | 14.9 |

Floor Slabs

After the subgrade soils and backfill/fill soils are compacted and placed as noted above in the General Geotechnical Site Preparation section, we recommend that at least 4 inches of free-draining granular soils be placed as a capillary moisture break immediately beneath the concrete floor slab. Free-draining soils should consist of non-plastic sand. These materials should be compacted until firm. We also recommend a vapor barrier be placed between the free-draining granular soils and the concrete floor slab.

Scoreboard and High Mast Light Pole Foundations

Based on the results of field tests, industry literature, and on our experience, recommendations have been developed for design soil parameters for the subsurface conditions indicated at the soil borings for the scoreboard and high mast light pole locations. The recommended design soil parameters for the scoreboard and high mast light pole locations are presented in Table I attached to this report. Lateral pressure coefficients presented in the table are based on the Rankine earth pressure theory.

Using the CWALSHT computer program developed by the U.S. Army Corps of Engineers that incorporates the Coulomb theory of lateral earth pressures, we also estimated minimum (active) and maximum (passive) earth pressures with depth for subsurface conditions indicated at the boring locations. Our calculated ultimate lateral pressures and recommended resisting lateral earth pressures (based on a factor of safety of about 2.0) at 2-ft depth increments and at stratum changes for the scoreboard and high mast light poles are shown in Table II attached to this report. It should be noted that no effort was made to estimate deflections required to mobilize the recommended resisting soil pressures.

Although groundwater was not encountered, the deeper clean sands may collapse during excavation for light poles. Therefore, the contractor should be prepared to utilize the slurry method to install foundations if required.

Softball Field

It is our understanding that the field turf for the softball field at Daphne High School will be a synthetic turf. Based upon the soil borings performed near the proposed dual purpose field area, clays, sandy clays, and clayey sands were encountered in the upper 12 ft below existing ground surface. It should be noted that based upon the soil borings at the project site and historical information in this area, groundwater will typically infiltrate slowly through the clayey sands and sandy clays/clays and/or perch near or above the clayey soil layers encountered from the ground surface to about 12 ft below the existing ground surface. The field designer should provide the appropriate design for supporting the turf field.

If the final layout and/or design of the building/structures change, additional geotechnical engineering services may be required.

General Geotechnical Site Preparation (Pavement Areas)

- After clearing and grubbing and the removal of any deleterious material within 5 ft of all pavement areas, planned pavement areas should be undercut, if required, to final subgrade elevations.
- We recommend that the clay soils be undercut to a depth of 18 inches below the bottom of the base layer. Undercutting should extend 3 ft outside of the paved areas.
- The backfill placed in the bottom 12 inches of the undercut should be clean sands (A-3) with no more 10 % passing the #200 sieve. These materials may be placed in a single lift and the top 6 inches should be compacted to 95 % SPD. Above the clean sands, 6 inches of *Select* fill (A-2-4) materials should be placed and compacted to 100 % SPD.
- Any other required backfill/fill soils should be *Select* materials. These materials should be placed in maximum 8-inch thick loose layers, and each layer should be compacted and tested before placement of the succeeding lift.
- Each layer of backfill/fill soils, up to the top layer, should be compacted to at least 95 % SPD.
- The 6 inches of backfill/fill/existing soils directly beneath the base materials should be compacted to at least 100 % SPD.

Recommended Pavement Sections

After the pavement subgrade soils have been prepared as described above, we recommend the pavement sections presented in the table below. The standard duty traffic is for areas to be utilized by passenger vehicles. This pavement section should support several passes per day by small buses and cargo vans. Medium duty pavements are recommended for areas where large trucks, garbage trucks, or buses will utilize the pavements.

| Recommended Pavement Sections | | |
|-------------------------------|---------------|-------------|
| Pavement Material | Standard Duty | Medium Duty |
| Crushed Aggregate Base | 6" | 6" |
| Upper Binder Layer | - | 250 #/SY |
| Wearing Surface | 200 #/SY | 200 #/SY |

- Where crushed aggregate will be required for this project, we recommend a crushed aggregate base (ALDOT 825 B) placed in lifts no thicker than 6 inches. Each lift should be compacted to at least 98 % modified Proctor density (MPD).
- Due to crushed stone shortages, crushed concrete may be considered an acceptable base material provided that the material meets the gradation requirements of ALDOT 825B and is free of deleterious materials.
- Pavement material properties should meet and construction practices should be in accord with the most current ALDOT Standard Specifications. The minimum compaction requirements outlined in this report supersede the minimum requirements in the ALDOT specifications.

CONSTRUCTION CONSIDERATIONS

Earthwork

Although the exposed subgrade soils may be relatively stable upon initial exposure, unstable subgrade soil conditions could develop during general construction operations, particularly if the soils are wetted and/or subjected to repetitive (rubber-tired) construction traffic. The use of light construction equipment would aid in reducing subgrade disturbance.

Upon completion of grading, care should be taken to maintain the subgrade moisture content near optimum prior to construction of slabs and pavements. Construction traffic over the completed subgrade should be avoided to the extent practical. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. If the subgrade should become frozen, desiccated, saturated, or disturbed, the affected material should be removed or these materials should be scarified, moisture conditioned and densified prior to pavement construction.

Engineering Services During Construction

The engineering recommendations provided in this report are based on the information obtained from the soils explorations, laboratory testing program, and experience on similar projects. Regardless of the thoroughness of a geotechnical exploration program, there is always a possibility that conditions at locations remote from borings will be different from those at specific boring locations and that conditions will not be as anticipated by the designers or constructors. In addition, the construction process may itself alter soil conditions. Therefore, we recommend that a representative of the geotechnical engineer of record observe and document the construction procedures used and the conditions encountered. Unanticipated conditions and inadequate procedures should be reported to the design team along with timely recommendations to address such conditions.

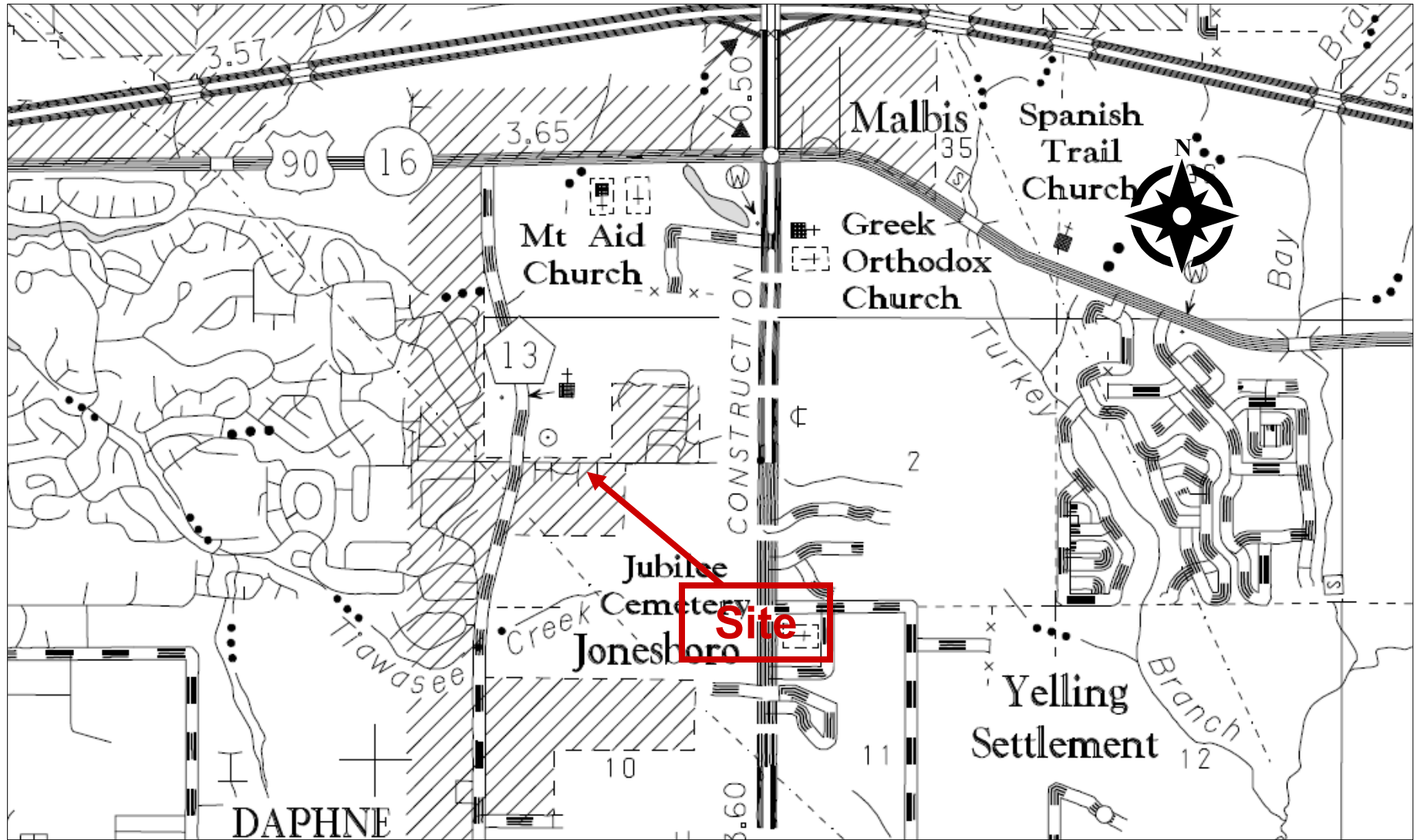
LIMITATIONS

This report concludes the authorized design phase geotechnical engineering services for the proposed New Softball Complex at Daphne High School in Daphne, Alabama. The evaluations and recommendations submitted in this report are based on the data obtained from the soil borings drilled at the locations shown on the boring location plans and selected laboratory testing. Our evaluations for the project roadways were based upon the plans submitted that was provided to us by Mckee and Associates Architects Inc. Additional assumptions and information provided have been outlined in the discussions contained in previous sections of this report.

The recommendations only apply to the specific project and site discussed in this report. If the project information section in this report contains incorrect information or if additional or revised information is available, correct or additional information should be conveyed to GET for review. We can then modify our recommendations if they are inappropriate for the proposed project. GET requests the opportunity to review the project plans prior to completion to ensure that our ideas and recommendations have been properly conveyed.

We have endeavored to complete the services identified herein in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions as this project. No other representation, express or implied, is included or intended, and no warranty or guarantee is included or intended in this report or any other instrument of service.

FIGURES



Source – General Highway Map Baldwin County, Alabama, Alabama Dept. of Transportation, 2010



New Softball field for
Daphne High School
Daphne, Al

Highway Location Map
Figure 1

TABLES

RECOMMENDED DESIGN SOIL PARAMETERS
NEW SOFTBALL COMPLEX AT DAPHNE HIGH SCHOOL FOR THE BALDWIN COUNTY BOARD OF EDUCATION
DAPHNE, ALABAMA
(GET PROJECT NO. 24-123)

| TABLE I-1A- BORING B-101 | | | | | | | |
|---------------------------------|-----------------------|----------------------------|-------------------------------------|---------------|------------------------------|-----------------------------|--------------------------|
| Depth Below Surface, Ft | Predominate Soil Type | Effective Unit Weight, PCF | Internal Angle of Friction, Degrees | Cohesion, PSF | Passive Pressure Coefficient | Active Pressure Coefficient | Net Pressure Coefficient |
| 0-6.5 | Clay | 60 | - | 750 | - | - | - |
| 6.5-17 | Sand | 60 | 34 | - | 3.54 | 0.28 | 3.26 |
| 17-30 | Sand | 50 | 30 | - | 3.00 | 0.33 | 2.67 |

| TABLE I-B - BORING B-102 | | | | | | | |
|---------------------------------|-----------------------|----------------------------|-------------------------------------|---------------|------------------------------|-----------------------------|--------------------------|
| Depth Below Surface, Ft | Predominate Soil Type | Effective Unit Weight, PCF | Internal Angle of Friction, Degrees | Cohesion, PSF | Passive Pressure Coefficient | Active Pressure Coefficient | Net Pressure Coefficient |
| 0 - 4 | Clay | 55 | - | 1000 | - | - | - |
| 4 - 11 | Clay | 60 | - | 1000 | - | - | - |
| 11 - 30 | Sand | 50 | 30 | - | 3.00 | 0.33 | 2.67 |

| TABLE I-C - BORING B-105 | | | | | | | |
|---------------------------------|-----------------------|----------------------------|-------------------------------------|---------------|------------------------------|-----------------------------|--------------------------|
| Depth Below Surface, Ft | Predominate Soil Type | Effective Unit Weight, PCF | Internal Angle of Friction, Degrees | Cohesion, PSF | Passive Pressure Coefficient | Active Pressure Coefficient | Net Pressure Coefficient |
| 0 - 6 | Clay | 60 | - | 1000 | - | - | - |
| 6 - 17 | Clay | 60 | - | 1500 | - | - | - |
| 17 - 30 | Sand | 55 | 30 | - | 3.00 | 0.33 | 2.67 |

| TABLE I-D - BORING B-108 | | | | | | | |
|---------------------------------|-----------------------|----------------------------|-------------------------------------|---------------|------------------------------|-----------------------------|--------------------------|
| Depth Below Surface, Ft | Predominate Soil Type | Effective Unit Weight, PCF | Internal Angle of Friction, Degrees | Cohesion, PSF | Passive Pressure Coefficient | Active Pressure Coefficient | Net Pressure Coefficient |
| 0 - 6 | Clay | 55 | - | 750 | - | - | - |
| 6 - 11.5 | Sand | 55 | 31 | - | 3.12 | 0.32 | 2.80 |
| 11.5 - 22 | Sand | 55 | 30 | - | 3.00 | 0.33 | 2.67 |
| 22 - 30 | Sand | 55 | 31 | - | 3.12 | .32 | 2.80 |

TABLE II - A
LATERAL EARTH PRESSURE RECOMMENDATIONS
NEW SOFTBALL COMPLEX AT DAPHNE HIGH SCHOOL
DAPHNE, ALABAMA
BORING B-101
(GET PROJECT NO. 24-123)

| Depth Below Ground Surface, Ft | Calculated Passive Pressure, PSF | Calculated Active Pressure, PSF | Recommended Allowable Resisting Lateral Pressure*, PSF |
|--------------------------------|----------------------------------|---------------------------------|--|
| 0 | 0 | 0 | 0 |
| 2 | 1740 | 0 | 870 |
| 4 | 1980 | 0 | 990 |
| 6 | 2220 | 0 | 1110 |
| 6.49 | 2280 | 0 | 1140 |
| 6.51 | 2759 | 220 | 1270 |
| 8 | 3395 | 271 | 1562 |
| 10 | 4244 | 339 | 1953 |
| 12 | 5093 | 407 | 2343 |
| 14 | 5942 | 475 | 2734 |
| 16 | 6791 | 542 | 3125 |
| 16.9 | 7215 | 576 | 3320 |
| 17.1 | 6120 | 680 | 2720 |
| 18 | 6450 | 716 | 2867 |
| 20 | 7110 | 790 | 3160 |
| 22 | 7770 | 863 | 3454 |
| 24 | 8430 | 936 | 3747 |
| 26 | 9090 | 1010 | 4040 |
| 28 | 9750 | 1083 | 4334 |
| 30 | 10410 | 1156 | 4627 |

* Factor of safety = 2.0

TABLE II - B
LATERAL EARTH PRESSURE RECOMMENDATIONS
NEW SOFTBALL COMPLEX AT DAPHNE HIGH SCHOOL
DAPHNE, ALABAMA
BORING B-102
(GET PROJECT NO. 24-123)

| Depth Below Ground Surface, Ft | Calculated Passive Pressure, PSF | Calculated Active Pressure, PSF | Recommended Allowable Resisting Lateral Pressure*, PSF |
|--------------------------------|----------------------------------|---------------------------------|--|
| 0 | 2000 | 0 | 1000 |
| 2 | 2115 | 0 | 1058 |
| 4 | 2460 | 0 | 1230 |
| 6 | 2700 | 0 | 1350 |
| 8 | 2940 | 0 | 1470 |
| 10 | 3180 | 0 | 1590 |
| 10.9 | 3300 | 0 | 1650 |
| 11.1 | 3900 | 433 | 1734 |
| 12 | 4230 | 470 | 1880 |
| 14 | 4890 | 543 | 2174 |
| 16 | 5550 | 616 | 2467 |
| 18 | 6210 | 690 | 2760 |
| 20 | 6870 | 763 | 3054 |
| 22 | 7530 | 836 | 3347 |
| 24 | 8190 | 910 | 3640 |
| 26 | 8850 | 983 | 3934 |
| 28 | 9510 | 1056 | 4227 |
| 30 | 10170 | 1130 | 4520 |
| * Factor of safety = 2.0 | | | |
| | | | |

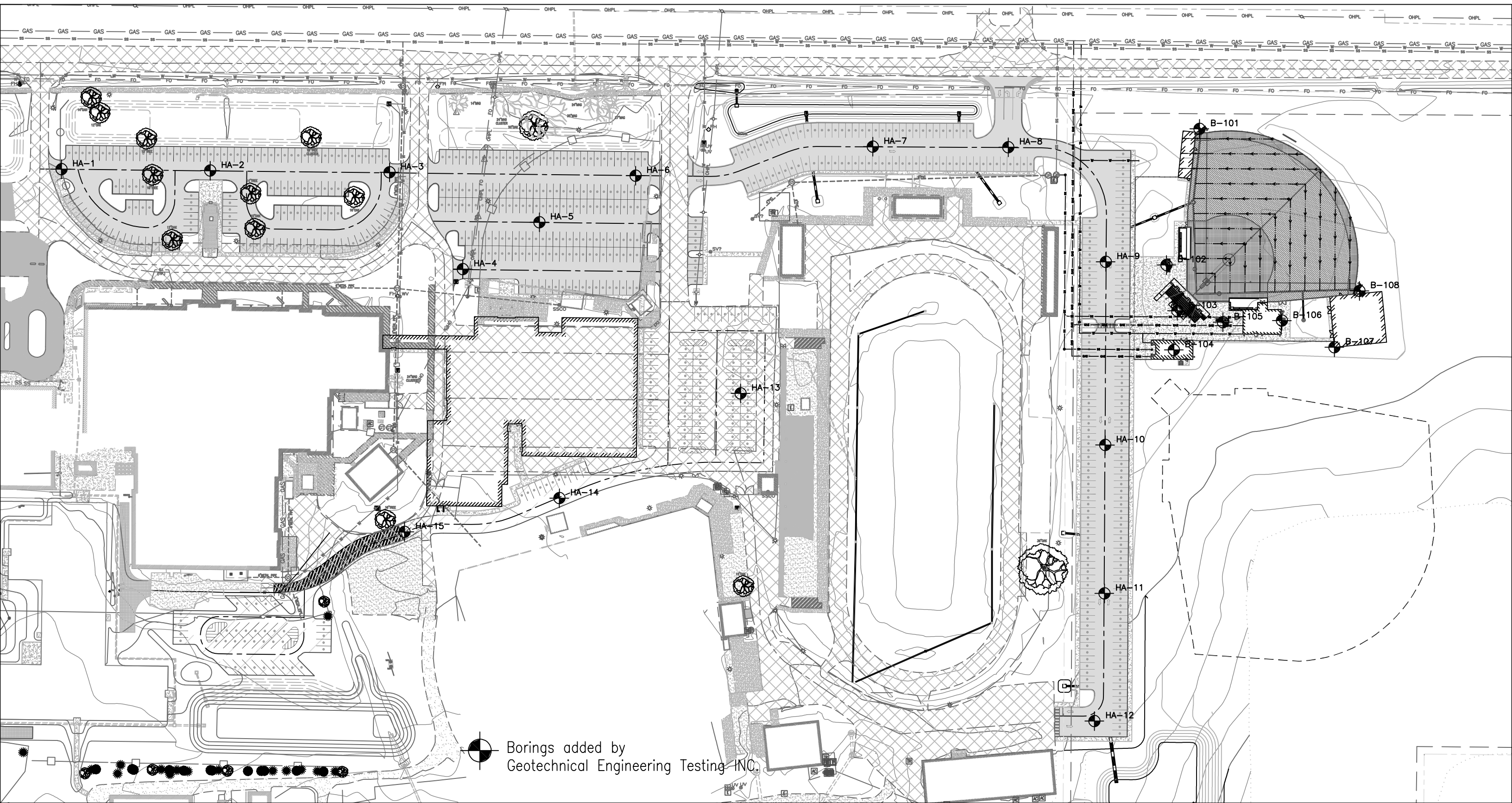
TABLE II - C
LATERAL EARTH RECOMMENDATIONS
NEW SOFTBALL COMPLEX AT DAPHNE HIGH SCHOOL
DAPHNE, ALABAMA
BORING B-105
(GET PROJECT NO. 24-123)

| Depth Below Ground Surface, Ft | Calculated Passive Pressure, PSF | Calculated Active Pressure, PSF | Recommended Allowable Resisting Lateral Pressure*, PSF |
|--------------------------------|----------------------------------|---------------------------------|--|
| 0 | 2000 | 0 | 1000 |
| 2 | 2240 | 0 | 1120 |
| 4 | 2480 | 0 | 1240 |
| 5.9 | 2720 | 0 | 1360 |
| 6.1 | 3720 | 0 | 1860 |
| 8 | 3960 | 0 | 1980 |
| 10 | 4200 | 0 | 2100 |
| 12 | 4440 | 0 | 2220 |
| 14 | 4680 | 0 | 2340 |
| 16 | 4920 | 0 | 2460 |
| 16.9 | 5040 | 0 | 2520 |
| 17.1 | 6120 | 680 | 2720 |
| 18 | 6450 | 716 | 2867 |
| 20 | 7110 | 790 | 3160 |
| 22 | 777 | 863 | -43 |
| 24 | 8430 | 936 | 3747 |
| 26 | 9090 | 1010 | 4040 |
| 28 | 9750 | 1083 | 4334 |
| 30 | 10410 | 1156 | 4627 |
| * Factor of safety = 2.0 | | | |
| | | | |

TABLE II - D
LATERAL EARTH PRESSURE RECOMMENDATIONS
NEW SOFTBALL COMPLEX AT DAPHNE HIGH SCHOOL
DAPHNE, ALABAMA
BORING B-108
(GET PROJECT NO. 24-123)

| Depth Below Ground Surface, Ft | Calculated Passive Pressure, PSF | Calculated Active Pressure, PSF | Recommended Allowable Resisting Lateral Pressure*, PSF |
|--------------------------------|----------------------------------|---------------------------------|--|
| 0 | 1500 | 0 | 750 |
| 2 | 1730 | 0 | 865 |
| 4 | 1960 | 0 | 980 |
| 5.9 | 2190 | 0 | 1095 |
| 6.1 | 2155 | 220 | 968 |
| 8 | 2874 | 294 | 1290 |
| 10 | 3592 | 368 | 1612 |
| 11.49 | 4131 | 423 | 1854 |
| 11.51 | 3967 | 440 | 1764 |
| 12 | 4140 | 460 | 1840 |
| 14 | 4830 | 536 | 2147 |
| 16 | 5520 | 613 | 2454 |
| 18 | 6210 | 690 | 2760 |
| 20 | 6900 | 766 | 3067 |
| 21.9 | 7590 | 843 | 3374 |
| 22.1 | 7903 | 809 | 3547 |
| 24 | 8622 | 883 | 3870 |
| 26 | 9340 | 957 | 4192 |
| 28 | 10059 | 1030 | 4515 |
| 30 | 10777 | 1104 | 4837 |
| * Factor of safety = 2.0 | | | |
| | | | |

APPENDIX A
BORING LOCATION PLAN



APPENDIX B
BORING LOGS

PROJECT NAME:

DATE DRILLED:

G.E.T. PROJ. NUMBER:

BORING DEPTH: 0 FT.

PROJECT LOCATION:

BORING ELEV.:

DRILL RIG:

DATUM:

DRILL METHOD:

WATER DEPTH:

DRILL CREW:

REMARKS:



BORING NUMBER: LEGEND

BORING LOCATION:

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | INSITU CBR (DCP) | UNIFIED CLASS |
|---------------|-----|--|------------|----------------|----------------|--------|------------------|------|------------------|--------------|------------------|---------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | TOPSOIL | | | | | | | | | | |
| 5 | | SAND | | | | | | | | | | |
| 10 | | CLAY | | | | | | | | | | |
| 15 | | SILT | | | | | | | | | | |
| 20 | | GRAVEL | | | | | | | | | | |
| 25 | | ORGANICS | | | | | | | | | | |
| 30 | | PEAT | | | | | | | | | | |
| 35 | | SILTY SAND (EXAMPLE OF A SOIL MIXTURE) | | | | | | | | | | |
| 40 | | SPLIT-SPOON SAMPLE (STANDARD PENETRATION TEST) | | | | | | | | | | |
| 45 | | UNDISTURBED TUBE SAMPLE | | | | | | | | | | |
| 50 | | SAMPLE NOT RECOVERED | | | | | | | | | | |
| 55 | | VANE SHEAR | | | | | | | | | | |
| | | B.T. @ 0 FT | | | | | | | | | | |

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED: 2/22/24

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 30 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: B-101

DRILL RIG: SIMCO 2800

BORING LOCATION:

DRILL METHOD: SOLID STEM AUGER

DRILL CREW: CARROL DRILLING & G&E DRILLING, ZS, HC(LOGGER)

REMARKS:

N: 232934 **E:** 1855317

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------|-----|---|------------|----------------|----------------|--------|------------------|------|------------------|--------------|--------------------|---------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 4" Topsoil | | | | | | | | | | |
| | | Loose brownish red clayey sand | 1 | 5 | | | | | | | | |
| | | Soft brownish red sandy clay | 2 | 4 | | | | | | | | |
| | | | 3 | 11 | | | | | | | | |
| 5 | | Stiff to very stiff brownish red sandy clay | 4 | 18 | | | | | | | | |
| | | | 5 | 24 | | | | | | | | |
| | | | 6 | 25 | | | | | | | | |
| 10 | | Firm brownish red clayey sand | 7 | 23 | | 15 | 46 | 40 | | 35.2 | | SC |
| | | | 8 | 27 | | | | | | | | |
| | | | 9 | 8 | | | | | | | | |
| 20 | | Loose to firm red sand with silt | 10 | 9 | | | | | | | | |
| | | | 11 | 13 | | | | | | | | |
| 25 | | | | | | | | | | | | |
| 30 | | Stiff yellowish brown sandy clay | | | | | | | | | | |
| | | B.T. @ 30 FT | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/31/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED: 5/23/24

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 30 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: B-102

DRILL RIG: SIMCO 2800

DRILL CREW: G&E
DRILLING, ZS, HC(LOGGER)

BORING LOCATION:

DRILL METHOD: SOLID STEM AUGER

REMARKS:

N: 232745 E: 1855276

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|---|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 4" Topsoil | 1 | 4 | | | | | | | | |
| | | Medium consistency yellowish brown sandy clay | 2 | 5 | | | | | | | c*=0.50 | |
| 5 | | | 3 | 11 | | | | | | | c*=0.50 | |
| | | Stiff to very stiff red sandy clay | 4 | 18 | | | | | | | | |
| | | | 5 | 19 | | | | | | | | |
| 10 | | | | | | | | | | | | |
| | | Firm red silty sand | 6 | 18 | | 10 | | | | 18.9 | | |
| 15 | | | | | | | | | | | | |
| | | Firm red and white sand with silt | 7 | 14 | | | | | | | | |
| 20 | | | | | | | | | | | | |
| | | Firm red silty sand | 8 | 18 | | | | | | | | |
| 25 | | | | | | | | | | | | |
| | | Firm Reddish yellow, red and white sand | 9 | 10 | | | | | | | | |
| 30 | | B.T. @ 30 FT | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/31/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED: 5/23/24

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 15 FT.

PROJECT LOCATION:

BORING ELEV.: NWTE

DATUM:

WATER DEPTH:



BORING NUMBER: B-103

DRILL RIG: SIMCO 2800

DRILL CREW: G&E
DRILLING, ZS, HC(LOGGER)

BORING LOCATION:

DRILL METHOD: SOLID STEM AUGER

REMARKS:

N: 232687 **E:** 1855283

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|---------------------------------|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 1" Topsoil | 1 | 4 | | 18 | | | 106 | | c*=0.88 | |
| | | Soft yellowish brown sandy clay | 2 | 2 | | | | | | | c*=0.25 | |
| 5 | | | 3 | 4 | | | | | | | | |
| | | | 4 | 15 | | | | | | | | |
| | | Very stiff red sandy clay | 5 | 16 | | | | | | | | |
| 10 | | | 6 | 11 | | | | | | | | |
| | | Firm red silty sand | | | | | | | | | | |
| 15 | | B.T. @ 15 FT | | | | | | | | | | |
| 20 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/31/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED: 5/23/24

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 15 FT.

PROJECT LOCATION:

BORING ELEV.: NWTE

DATUM:

WATER DEPTH:



BORING NUMBER: B-104

DRILL RIG: SIMCO 2800

DRILL CREW: G&E
DRILLING, ZS, HC(LOGGER)

BORING LOCATION:

DRILL METHOD: SOLID STEM AUGER

REMARKS:

N: 232635 **E:** 1855278

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|--|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 3" Topsoil | 1 | 3 | | | | | | | c*=0.75 | |
| | | Soft to medium consistency yellowish brown sandy clay | 2 | 4 | | | | | | | | |
| 5 | | | 3 | 6 | | | | | | | | |
| | | | 4 | 16 | | | | | | | | |
| 10 | | Very stiff red sandy clay | 5 | 19 | | | | | | | | |
| | | | 6 | 16 | | | | | | | | |
| 15 | | Firm red silty sand | | | | | | | | | | |
| | | B.T. @ 15 FT | | | | | | | | | | |
| 20 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/31/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED: 5/23/24

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 30 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: B-105

DRILL RIG: SIMCO 2800

DRILL CREW: G&E
DRILLING, ZS, HC(LOGGER)

BORING LOCATION:

DRILL METHOD: SOLID STEM AUGER

REMARKS:

N: 232673 **E:** 1855346

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|---|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 4" Topsoil | 1 | 2 | | | | | | | c*=0.75 | |
| | | Soft to medium consistency yellowish brown sandy clay | 2 | 2 | | | | | | | c*=0.25 | |
| 5 | | | 3 | 7 | | | | | | | | |
| | | Stiff yellowish brown sandy clay | 4 | 13 | | | | | | | c*=1.75 | |
| | | | 5 | 15 | | | | | | | | |
| 10 | | | 6 | 23 | | | | | | | | |
| | | Very stiff to stiff red sandy clay | | | | | | | | | | |
| | | | 7 | 10 | | | | | | | | |
| 15 | | | | | | | | | | | | |
| | | Firm red silty sand | 8 | 11 | | | | | | | | |
| 20 | | | | | | | | | | | | |
| | | Firm red and white sand with silt | 9 | 15 | | 5 | | | | 21.0 | | |
| 25 | | | | | | | | | | | | |
| | | Firm light red sand with silt | 10 | 14 | | | | | | | | |
| 30 | | B.T. @ 30 FT | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/31/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED: 5/23/24

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 15 FT.

PROJECT LOCATION:

BORING ELEV.: NWTE

DATUM:

WATER DEPTH:



BORING NUMBER: B-106

DRILL RIG: SIMCO 2800

DRILL CREW: G&E
DRILLING, ZS, HC(LOGGER)

BORING LOCATION:

DRILL METHOD: SOLID STEM AUGER

REMARKS:

N: 232676 **E:** 1855423

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|---|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 3" Topsoil | 1 | 4 | | | | | | | c*=1.00 | |
| | | Medium consistency yellowish brown sandy clay | 2 | 6 | | 21 | | | | | | |
| 5 | | | 3 | 9 | | | | | | | | |
| | | | 4 | 18 | | | | | | | | |
| | | Firm red clayey sand | 5 | 16 | | | | | | | | |
| 10 | | | | | | | | | | | | |
| | | Firm red silty sand | 6 | 17 | | | | | | | | |
| 15 | | B.T. @ 15 FT | | | | | | | | | | |
| 20 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/31/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED: 5/23/24

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 15 FT.

PROJECT LOCATION:

BORING ELEV.: NWTE

DATUM:

WATER DEPTH:



BORING NUMBER: B-107

DRILL RIG: SIMCO 2800

DRILL CREW: G&E
DRILLING, ZS, HC(LOGGER)

BORING LOCATION:

DRILL METHOD: SOLID STEM AUGER

REMARKS:

N: 232639 **E:** 1855494

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|---|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 6" Topsoil | 1 | 4 | | | | | | | c*=1.00 | |
| | | Medium consistency yellowish brown sandy clay | 2 | 4 | | 24 | | | | | | |
| 5 | | Stiff yellowish brown sandy clay | 3 | 7 | | | | | | | | |
| | | | 4 | 15 | | | | | | | | |
| | | | 5 | 15 | | | | | | | | |
| 10 | | Firm red clayey sand | | | | | | | | | | |
| | | | 6 | 15 | | | | | | | | |
| 15 | | B.T. @ 15 FT | | | | | | | | | | |
| 20 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/31/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED: 5/23/24

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 30 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: B-108

DRILL RIG: SIMCO 2800

DRILL CREW: G&E
DRILLING, ZS, HC(LOGGER)

BORING LOCATION:

DRILL METHOD: SOLID STEM AUGER

REMARKS:

N: 232718 E: 1855529

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|-----------------------------------|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 4" Topsoil | 1 | 3 | | | | | | | | |
| | | Soft yellowish brown sandy clay | 2 | 2 | | | | | | | | |
| 5 | | | 3 | 2 | | 21 | | | | | | |
| | | Firm red clayey sand | 4 | 15 | | | | | | | | |
| | | | 5 | 16 | | | | | | | | |
| 10 | | | | | | | | | | | | |
| | | Firm to loose red silty sand | 6 | 11 | | | | | | | | |
| 15 | | | | | | | | | | | | |
| | | | 7 | 6 | | | | | | | | |
| 20 | | | | | | | | | | | | |
| | | Firm red and white sand with silt | 8 | 15 | | | | | | | | |
| 25 | | | | | | | | | | | | |
| | | | 9 | 21 | | | | | | | | |
| 30 | | B.T. @ 30 FT | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/31/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 6 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: HA-1

DRILL RIG:

BORING LOCATION:

DRILL METHOD: HAND AUGER

DRILL CREW: KF, Q,
ZS(LOGGER)

REMARKS:

N: 232877 E: 1853803

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|----------------------------------|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 1" Topsoil | | | | | | | | | | |
| | | Light yellowish brown sandy clay | 1 | | | 13 | 16 | 9 | | 52.8 | | CL |
| | | Reddish brown sandy clay | 2 | | | | | | | | | |
| 5 | | | | | | | | | | | | |
| | | B.T. @ 6 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 6 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: HA-2

DRILL RIG:

BORING LOCATION:

DRILL METHOD: HAND AUGER

DRILL CREW: KF, Q,
ZS(LOGGER)

REMARKS:

N: 232511 E: 1855189

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|---|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 3" Topsoil | | | | | | | | | | |
| | | Grayish brown clayey sand | 1 | | | | | | | | | |
| | | Yellowish brown sandy clay | 2 | | | 15 | 38 | 14 | | 64.2 | | CL |
| | | Reddis brown sandy clay with trace gravel | 3 | | | | | | | | | |
| 5 | | Light grayish brown clayey sand | 4 | | | | | | | | | |
| | | B.T. @ 6 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 6 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: HA-3

DRILL RIG:

BORING LOCATION:

DRILL METHOD: HAND AUGER

DRILL CREW: KF, Q,
ZS(LOGGER)

REMARKS:

N: 232312 E: 1855189

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|-------------------------|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 8" Topsoil | | | | | | | | | | |
| | | Light brown clayey sand | 1 | | | 14 | 21 | 7 | | 57.0 | | CL-ML |
| 5 | | | | | | | | | | | | |
| | | B.T. @ 6 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 6 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: HA-4

DRILL RIG:

BORING LOCATION:

DRILL METHOD: HAND AUGER

DRILL CREW: KF, Q,
ZS(LOGGER)

REMARKS:

N: 232140 E: 1855178

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|----------------------------|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 3" Topsoil | | | | | | | | | | |
| | | Yellowish brown sandy clay | 1 | | | 14 | 24 | 16 | | 55.5 | | CL |
| | | Reddish brown sandy clay | 2 | | | | | | | | | |
| 5 | | | | | | | | | | | | |
| | | B.T. @ 6 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 6 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: HA-5

DRILL RIG:

BORING LOCATION:

DRILL METHOD: HAND AUGER

DRILL CREW: KF, Q,
ZS(LOGGER)

REMARKS:

N: 232577 E: 1854702

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|---|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 3.5" Topsoil | | | | | | | | | | |
| | | Brown clayey sand | 1 | | | | | | | | | |
| | | Yellowish brown sandy clay | 2 | | | 11 | 28 | 19 | | 59.7 | | CL |
| | | Yellowish brown and reddish brown clayey sand | 3 | | | | | | | | | |
| 5 | | B.T. @ 6 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:



G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 6 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

BORING NUMBER: HA-6

DRILL RIG:

WATER DEPTH:

BORING LOCATION:

DRILL METHOD: HAND AUGER

DRILL CREW: KF, Q,
ZS(LOGGER)

REMARKS:

N: 232430 E: 1854467

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|---------------------------|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | | | | | | | | | | | |
| | | Brownish red sandy clay | 1 | | | 9 | 17 | 8 | | 56.7 | | CL |
| 5 | | Reddish yellow sandy clay | 2 | | | | | | | | | |
| | | B.T. @ 6 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 5.5 FT.

PROJECT LOCATION:

BORING ELEV.: NWTE

DRILL RIG:

DATUM:

DRILL METHOD: HAND AUGER

WATER DEPTH:

DRILL CREW:



BORING NUMBER: HA-7

BORING LOCATION:

REMARKS:

N: 232388 E: 1854259

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------|-----|--------------------------|------------|----------------|----------------|--------|------------------|------|------------------|--------------|--------------------|---------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | | | | | | | | | | | |
| | | Light brown clayey sand | 1 | | | 14 | 23 | 14 | | 56.2 | | CL |
| | | Reddish brown sandy clay | 2 | | | | | | | | | |
| 5 | | B.T. @ 5.5 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 6 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: HA-8

DRILL RIG: SIMCO 2800

DRILL CREW: G&E
DRILLING, ZS(LOGGER)

BORING LOCATION:

DRILL METHOD: SOLID STEM AUGER

REMARKS:

N: 232876 E: 1853994

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|--------------------------------|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | | | | | | | | | | | |
| | | | 1 | 14 | | | | | | | | |
| | | Stiff grayish brown sandy clay | 2 | 9 | | | | | | | | |
| 5 | | | 3 | 9 | | | | | | | | |
| | | B.T. @ 6 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 5.5 FT.

PROJECT LOCATION:

BORING ELEV.: NWTE

DRILL RIG:

DATUM:

DRILL METHOD: HAND AUGER

WATER DEPTH:

DRILL CREW:



BORING NUMBER: HA-9

BORING LOCATION:

REMARKS:

N: 232872 E: 1854232

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------|-----|--------------------------|------------|----------------|----------------|--------|------------------|------|------------------|--------------|--------------------|---------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 7" Topsoil | | | | | | | | | | |
| | | Brownish red sandy clay | 1 | | | 21 | 35 | 23 | | 62.5 | | CL |
| 5 | | Reddish brown sandy clay | 2 | | | | | | | | | |
| | | B.T. @ 5.5 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 5.5 FT.

PROJECT LOCATION:

BORING ELEV.: NWTE

DRILL RIG:

DATUM:

DRILL METHOD: HAND AUGER

WATER DEPTH:

DRILL CREW:



BORING NUMBER: HA-10

BORING LOCATION:

REMARKS:

N: 232744 E: 1854332

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------|-----|--------------------------------|------------|----------------|----------------|--------|------------------|------|------------------|--------------|--------------------|---------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 4" Topsoil | | | | | | | | | | |
| | | Light brown sandy clay | 1 | | | | | | | | | |
| | | Light reddish brown sandy clay | 2 | | | 20 | 33 | 23 | | 61.4 | | CL |
| 5 | | B.T. @ 5.5 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 5.5 FT.

PROJECT LOCATION:

BORING ELEV.: NWTE

DRILL RIG:

DATUM:

DRILL METHOD: HAND AUGER

WATER DEPTH:

DRILL CREW:



BORING NUMBER: HA-11

BORING LOCATION:

REMARKS:

N: 232806 E: 1854438

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------|-----|--------------------------|------------|----------------|----------------|--------|------------------|------|------------------|--------------|--------------------|---------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 4" Topsoil | | | | | | | | | | |
| | | Reddish brown sandy clay | 1 | | | 20 | 37 | 23 | | 60.0 | | CL |
| | | Brown sandy clay | 2 | | | | | | | | | |
| | | Brown clayey sand | 3 | | | | | | | | | |
| 5 | | B.T. @ 5.5 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 5.5 FT.

PROJECT LOCATION:

BORING ELEV.: NWTE

DRILL RIG:

DATUM:

DRILL METHOD: HAND AUGER

WATER DEPTH:

DRILL CREW:



BORING NUMBER: HA-12

BORING LOCATION:

REMARKS:

N: 232871 E: 1854562

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------|-----|--|------------|----------------|----------------|--------|------------------|------|------------------|--------------|--------------------|---------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 3" Topsoil | | | | | | | | | | |
| | | Light brown clayey sand | 1 | | | | | | | | | |
| | | Light red and reddish brown sandy clay | 2 | | | 21 | 39 | 28 | | 62.5 | | CL |
| | | Reddish brown sandy clay | 3 | | | | | | | | | |
| 5 | | B.T. @ 5.5 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 6 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: HA-13

DRILL RIG: SIMCO 2800

DRILL CREW: G&E
DRILLING, ZS(LOGGER)

BORING LOCATION:

REMARKS:

N: 232908 E: 1854875

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------|-----|-----------------------------------|------------|----------------|----------------|--------|------------------|------|------------------|--------------|--------------------|---------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 3" Asphalt | | | | | | | | | | |
| | | Medium consistency red sandy clay | 1 | 5 | | | | | | | | |
| | | Medium consistency red sandy clay | 2 | 5 | | | | | | | | |
| 5 | | Very stiff red sandy clay | 3 | 14 | | | | | | | | |
| | | B.T. @ 6 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 6 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: HA-14

DRILL RIG: SIMCO 2800

DRILL CREW: G&E
DRILLING, ZS(LOGGER)

BORING LOCATION:

DRILL METHOD: SOLID STEM AUGER

REMARKS:

N: 232897 **E:** 1855073

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|----------------------|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 4" Topsoil | | | | | | | | | | |
| | | | 1 | 9 | | | | | | | | |
| | | Stiff red sandy clay | 2 | 7 | | | | | | | | |
| 5 | | | 3 | 10 | | | | | | | | |
| | | B.T. @ 6 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

PROJECT NAME: DAPHNE HIGH SCHOOL

DATE DRILLED:

G.E.T. PROJ. NUMBER: 24-123

BORING DEPTH: 6 FT.

BORING ELEV.: NWTE

PROJECT LOCATION:

DATUM:

WATER DEPTH:



BORING NUMBER: HA-15

DRILL RIG: SIMCO 2800

DRILL CREW: G&E
DRILLING, ZS(LOGGER)

BORING LOCATION:

DRILL METHOD: SOLID STEM AUGER

REMARKS:

N: 232752 E: 1855185

| DEPTH IN FEET | LOG | DESCRIPTION | SAMPLE NO. | S.P.T. | | W.C. % | ATTERBERG LIMITS | | DRY UNIT WT. pcf | % MINUS #200 | SHEAR STRENGTH tsf | UNIFIED CLASS |
|---------------------|-----|-----------------------------------|---------------|----------------|----------------|-----------|---------------------|------|---------------------------|--------------------|--------------------------|------------------|
| | | | | N _r | N _c | | L.L. | P.I. | | | | |
| 0 | | 4" Gravel | | | | | | | | | | |
| | | Medium consistency dark gray clay | 1 | 7 | | | | | | | | |
| | | Medium consistency red sandy clay | 2 | 8 | | | | | | | | |
| 5 | | | 3 | 8 | | | | | | | | |
| | | B.T. @ 6 FT | | | | | | | | | | |
| 10 | | | | | | | | | | | | |

MOD DEEP BORING LOG W/O NC VALUES & N-E 24-123 DAPHNE HIGH SCHOOL.GPJ GET_AL4.GDT 5/30/24

NOTE: The stratification lines shown represent the approximate boundary between soil types and the transition may be gradual. The groundwater level stated is for conditions at the time of boring and the level may fluctuate large amounts for other conditions or seasons.

Reviewed By:

APPENDIX C
LABORATORY TEST RESULTS

| Boring Location | Boring No. | Sample ID | Depth (ft) | Water Content (%) | Atterberg Limits | | | % Gravel | % Sand | % Passing 200 (if hydrometer data available) | | D ₅₀ (mm) | USCS | AASHTO Class |
|-------------------------|------------|-----------|------------|-------------------|------------------|----|----|----------|--------|---|--------|----------------------|-----------|--------------|
| | | | | | LL | PL | PI | | | % Silt | % Clay | | | |
| N: 232934 E: 1855317 | B-101 | 7 | 11.5 | 15 | 46 | 6 | 40 | 0.0 | 64.8 | 35.2 | 0.193 | SC | A-2-7 (6) | |
| N: 232745 E: 1855276 | B-102 | 6 | 13.5 | 10 | | | | 0.0 | 81.1 | 18.9 | 0.369 | | | |
| N: 232687 E: 1855283 | B-103 | | 0.0 | | | | | 0.0 | 43.4 | 56.6 | | | | |
| N: 232687 E: 1855283 | B-103 | 1 | 0.5 | 18 | | | | | | | | | | |
| N: 232673 E: 1855346 | B-105 | 9 | 23.5 | 5 | | | | 0.0 | 79.0 | 21.0 | 0.343 | | | |
| N: 232676 E: 1855423 | B-106 | | 2.0 | | 33 | 12 | 21 | 0.2 | 38.8 | 61.0 | | CL | A-6 (9) | |
| N: 232676 E: 1855423 | B-106 | 2 | 2.5 | 21 | | | | | | | | | | |
| N: 232639 E: 1855494 | B-107 | | 2.0 | | | | | 1.2 | 33.5 | 65.3 | | | | |
| N: 232639 E: 1855494 | B-107 | 2 | 2.5 | 24 | | | | | | | | | | |
| N: 232718 E: 1855529 | B-108 | | 4.0 | | | | | 0.9 | 45.0 | 54.2 | | | | |
| N: 232718 E: 1855529 | B-108 | 3 | 4.5 | 21 | | | | | | | | | | |
| N: 232877 E: 1853803 | HA-1 | 1 | 0.1 | 13 | 16 | 7 | 9 | 0.5 | 46.7 | 52.8 | | CL | A-4 (1) | |
| N: 232511 E: 1855189 | HA-2 | 2 | 0.9 | 15 | 38 | 24 | 14 | 0.0 | 35.8 | 64.2 | | CL | A-6 (7) | |
| N: 232312 E: 1855189 | HA-3 | 1 | 0.7 | 14 | 21 | 14 | 7 | 0.4 | 42.6 | 57.0 | | CL-ML | A-4 (1) | |
| N: 232140 E: 1855178 | HA-4 | 1 | 0.3 | 14 | 24 | 8 | 16 | 0.0 | 44.5 | 55.5 | | CL | A-6 (5) | |
| N: 232577 E: 1854702 | HA-5 | 2 | 1.4 | 11 | 28 | 9 | 19 | 0.0 | 40.3 | 59.7 | | CL | A-6 (8) | |



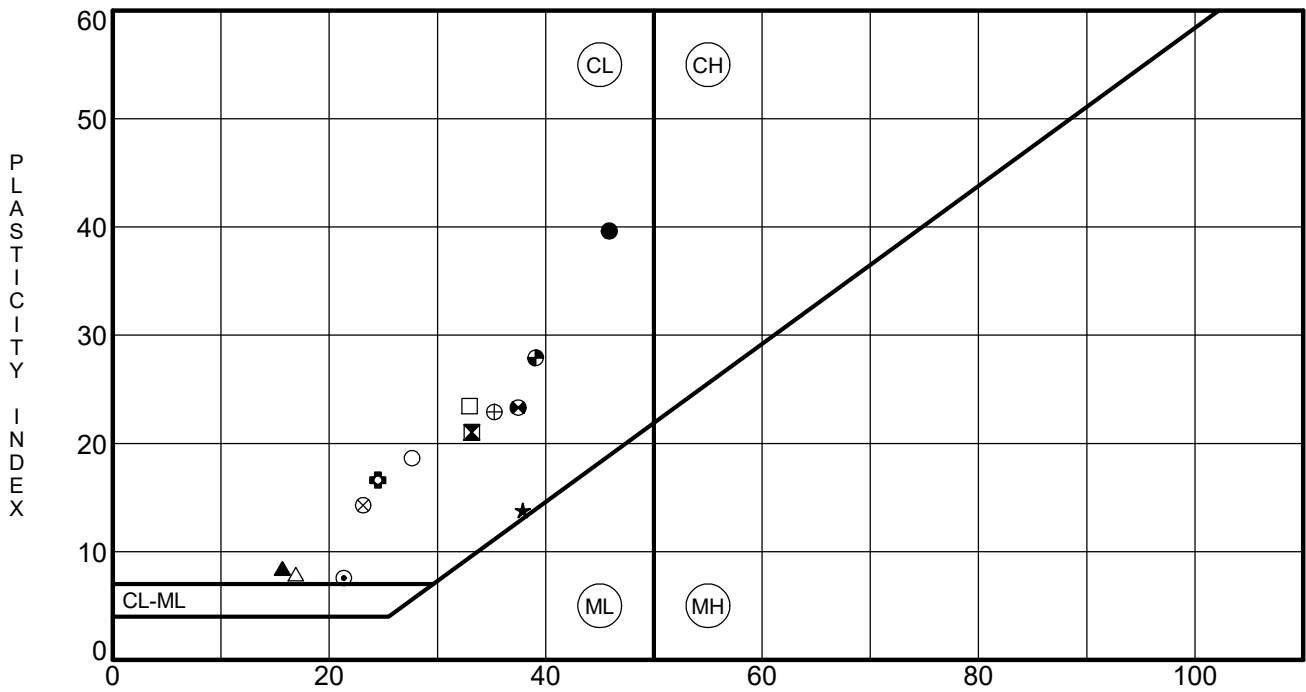
SOIL CLASSIFICATION SUMMARY

GET PROJECT NUMBER: 24-123
PROJECT NAME: DAPHNE HIGH SCHOOL
COUNTY: BALDWIN

| Boring Location | Boring No. | Sample ID | Depth (ft) | Water Content (%) | Atterberg Limits | | | % Gravel | % Sand | % Passing 200 <small>(if hydrometer data available)</small> | | D ₅₀ (mm) | USCS | AASHTO Class |
|-------------------------|------------|-----------|------------|-------------------|------------------|----|----|----------|--------|--|--------|-------------------------|----------|--------------|
| | | | | | LL | PL | PI | | | % Silt | % Clay | | | |
| N: 232430 E: 1854467 | HA-6 | 1 | 0.3 | 9 | 17 | 9 | 8 | 0.0 | 43.3 | 56.7 | | CL | A-4 (1) | |
| N: 232388 E: 1854259 | HA-7 | 1 | 0.3 | 14 | 23 | 9 | 14 | 0.5 | 43.3 | 56.2 | | CL | A-6 (4) | |
| N: 232872 E: 1854232 | HA-9 | 1 | 0.6 | 21 | 35 | 12 | 23 | 0.8 | 36.8 | 62.5 | | CL | A-6 (11) | |
| N: 232744 E: 1854332 | HA-10 | 2 | 1.3 | 20 | 33 | 10 | 23 | 2.1 | 36.5 | 61.4 | | CL | A-6 (10) | |
| N: 232806 E: 1854438 | HA-11 | 1 | 0.3 | 20 | 37 | 14 | 23 | 0.9 | 39.1 | 60.0 | | CL | A-6 (10) | |
| N: 232871 E: 1854562 | HA-12 | 2 | 1.7 | 21 | 39 | 11 | 28 | 2.1 | 35.3 | 62.5 | | CL | A-6 (14) | |



| SOIL CLASSIFICATION SUMMARY |
|--|
| GET PROJECT NUMBER: 24-123 PROJECT NAME: DAPHNE HIGH SCHOOL COUNTY: BALDWIN |



Test Method: _____ LIQUID LIMIT

| Boring ID | Depth (ft.) | LL | PL | PI | Fines | Classification |
|-----------|-------------|----|----|----|-------|--------------------------|
| ● B-101 | 11.5 | 46 | 6 | 40 | 35.2 | CLAYEY SAND (SC) |
| ⊠ B-106 | 2.0 | 33 | 12 | 21 | 61.0 | SANDY LEAN CLAY (CL) |
| ▲ HA-1 | 0.1 | 16 | 7 | 9 | 52.8 | SANDY LEAN CLAY (CL) |
| ★ HA-2 | 0.9 | 38 | 24 | 14 | 64.2 | SANDY LEAN CLAY (CL) |
| ⊙ HA-3 | 0.7 | 21 | 14 | 7 | 57.0 | SANDY SILTY CLAY (CL-ML) |
| ⊕ HA-4 | 0.3 | 24 | 8 | 16 | 55.5 | SANDY LEAN CLAY (CL) |
| ○ HA-5 | 1.4 | 28 | 9 | 19 | 59.7 | SANDY LEAN CLAY (CL) |
| △ HA-6 | 0.3 | 17 | 9 | 8 | 56.7 | SANDY LEAN CLAY (CL) |
| ⊗ HA-7 | 0.3 | 23 | 9 | 14 | 56.2 | SANDY LEAN CLAY (CL) |
| ⊕ HA-9 | 0.6 | 35 | 12 | 23 | 62.5 | SANDY LEAN CLAY (CL) |
| □ HA-10 | 1.3 | 33 | 10 | 23 | 61.4 | SANDY LEAN CLAY (CL) |
| ⊕ HA-11 | 0.3 | 37 | 14 | 23 | 60.0 | SANDY LEAN CLAY (CL) |
| ⊕ HA-12 | 1.7 | 39 | 11 | 28 | 62.5 | SANDY LEAN CLAY (CL) |
| | | | | | | |
| | | | | | | |
| | | | | | | |
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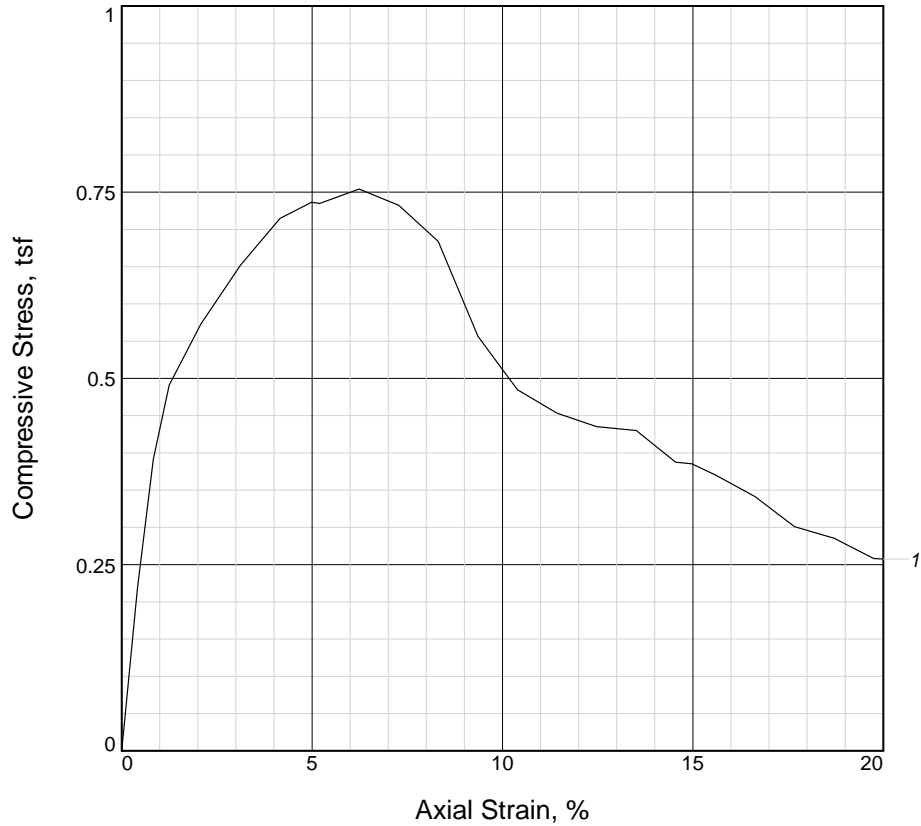
US ATTERBERG LIMITS 24-123 DAPHNE HIGH SCHOOL.GPJ GETI AL.GDT 5/31/24



ATTERBERG LIMITS RESULTS

PROJECT NAME: DAPHNE HIGH SCHOOL
 G.E.T. PROJ. NUMBER: 24-123
 PROJECT LOCATION:

UNCONFINED COMPRESSION TEST



| | | | | |
|-------------------------------|--------|--|--|--|
| Sample No. | 1 | | | |
| Unconfined strength, tsf | 0.754 | | | |
| Undrained shear strength, tsf | 0.377 | | | |
| Failure strain, % | 6.2 | | | |
| Strain rate, in./min. | 0.03 | | | |
| Water content, % | 17.9 | | | |
| Wet density, pcf | 125.2 | | | |
| Dry density, pcf | 102.3 | | | |
| Saturation, % | 94.2 | | | |
| Void ratio | 0.6355 | | | |
| Specimen diameter, in. | 1.39 | | | |
| Specimen height, in. | 2.41 | | | |
| Height/diameter ratio | 1.73 | | | |

Description: Yellowish brown clay

LL = **PL =** **PI =** **GS= 2.68** **Type: Split Spoon**

| | |
|--|--|
| <p>Project No.: Date Sampled: Remarks: 5-29-2024 Type 2A Shear Failure</p> <p>Figure _____</p> | <p>Client: Project: Source of Sample: Split Spoon Depth: 0' - 2' Sample Number: B-103, S-1</p> <hr/> <p style="text-align: center;">UNCONFINED COMPRESSION TEST Geotechnical Engineering-Testing, Inc. Mobile, AL</p> |
|--|--|

Tested By: ZS

SECTION 02282 - TERMITE CONTROL

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. Provide soil treatment for termite control, as herein specified.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and application instructions.

1.4 QUALITY ASSURANCE

- A. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work, including preparation of substrate and application.
- B. Engage a professional pest control operator, licensed in accordance with regulations of governing authorities for application of soil treatment solution.
- C. Use only termiticides which bear a Federal registration number of the US Environmental Protection Agency.

1.5 JOB CONDITIONS

- A. Restrictions: Do not apply soil treatment solution until excavating, filling and grading operations are completed, except as otherwise required in construction operations.
- B. To insure penetration, do not apply soil treatment to frozen or excessively wet soils or during inclement weather. Comply with handling and application instructions of the soil toxicant manufacturer.

1.6 SPECIFIC PRODUCT WARRANTY

- A. Furnish written warranty certifying that applied soil termiticide treatment will prevent infestation of subterranean termites and that if subterranean termite activity is discovered during warranty period. Contractor will re-treat soil and repair or replace damage caused by termite infestation.
 - 1. Provide warranty for a period of 5 years from date of treatment, signed by Applicator and Contractor. This includes all costs associated with re-inspections per the manufacturer's requirements, re-treatment, repair and replace damage caused by termite infestation.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT SOLUTION

- A. Use an emulsible concentrate termiticide for dilution with water, specially formulated to prevent infestation by termites. Fuel oil will not be permitted as a diluent. Provide a solution consisting of one of the following chemical elements and concentrations:
 - 1. Water based emulsion, uniform composition, synthetic dye to permit visual identification of treated soil, of a generic chemical type in compliance with state and federal law and regulations.
- B. Solutions as recommended by Applicator and approved for intended application by jurisdictional authorities. Use only soil treatment solutions which are not injurious to planting or persons.

PART 3 – EXECUTION

3.1 APPLICATION

- A. Surface Preparation: Remove foreign matter which could decrease effectiveness of treatment on areas to be treated. Loosen, rake and level soil to be treated, except previously compacted areas under slabs and foundations. Toxicants may be applied before placement of compacted fill under slabs, if recommended by toxicant manufacturer.
- B. Application Rates: Water to be added to solution at job site in the presence of field Superintendent. Apply soil treatment solution at a rate as recommended by the manufacture at the following locations:
- C. Under slab-on-grade structures, treat soil before concrete slabs are placed, including entire inside perimeter inside of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab and around interior column footers.
- D. Apply chemical solution to soil in critical areas under slab, including entire inside perimeter inside of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab and around interior column footers.
 - 1. Apply chemical solution as an overall treatment under slab and attached slab areas where fill is soil or unwashed gravel. Apply chemical solution to areas where fill is washed gravel or other coarse absorbent material.
- E. Under crawl-space and basement structures, treat soil along exterior and interior walls of foundations with shallow footings as specified above for exterior of slab-on-grade structures.
- F. Treat soil under or around crawl-space structures as follows:
 - 1. Apply chemical solution along inside of foundation walls, along both sides of interior partitions, and around piers and plumbing. Do not apply an overall treatment in crawl spaces.
 - 2. Apply chemical solution for each foot of depth from grade to footing, along outside of foundation walls, including part beneath entrance platform porches, etc.
 - 3. Apply chemical solution along the side and outside of foundation walls of porches.
 - 4. Apply as an overall treatment, only where attached concrete platform and porches are on fill or ground.
- G. At hollow masonry foundations or grade beams, treat voids.
- H. At expansion joints, control joints, and areas where slabs will be penetrated, apply chemical solution.
- I. Post signs in areas of application to warn workers that soil termiticide treatment has been applied. Remove signs when areas are covered by other construction.
- J. Reapply soil treatment solution to areas disturbed by subsequent excavation, landscape grading, or other construction activities following application.

END OF SECTION

SECTION 02513 - ASPHALTIC 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 asphaltic concrete paving work is shown on drawings.

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 for 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.

1.4 TESTING AND INSPECTION

- A. Testing and Inspection Service: The **Owner** will select a firm to provide testing and inspection service, to include testing soil materials proposed for use in work and provide field facilities for quality control testing during paving operations and shall pay cost for testing. Spot checking of the depths of the compacted base prior to paving shall be done to verify that materials meet the minimum required thickness. Temperature and thickness of paving will be periodically monitored during the paving operation.

1.5 SUBMITTALS

- A. Material Certificates: Provide copies of materials certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.

1.6 JOB CONDITIONS

- A. Weather Limitations: Apply prime and tack coats when ambient temperature is above 50 degrees Fahrenheit and when temperature has not been below 35 degrees Fahrenheit for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
- B. Construct asphalt concrete surface course when atmospheric temperature is above 40 degrees Fahrenheit and when base is dry. Base course may be placed when air temperature is above 30 degrees Fahrenheit and rising.
- C. Grade Control: Establish and maintain required lines and elevations.

PART 2 - PRODUCTS

2.1 MATERIALS: See Civil Drawings and Geotechnical Report for paving sections.

- A. Herbicide Treatment: Commercial chemical for weed control, registered by Environmental Protection Agency. Provide granular, liquid, or wettable powder form.
- B. Manufacturer: Subject to compliance with requirements, provide products of one of the following:
 1. Allied Chemical Corporation
 2. Achem Products, Inc.
 3. Ciba-Geigy Corporation
 4. Dow Chemical U.S.A.
 5. E.I. DuPont De Nemours and Company, Inc.

6. FMC Corporation
7. Thompson-Hayward Chemical Company
8. U. S. Borax and Chemical Company

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

- A. General: The top six inches of finish subgrade soil beneath pavement and base, shall be mixed, moisture adjusted and remolded in accordance with Section 230, Modified Roadbed, of the before mentioned referenced standard.
- B. Proof roll prepared subgrade surface to check for unstable areas and areas requiring additional compaction.
- C. Notify Architect of unsatisfactory conditions. Do not begin paving work until deficient subgrade areas have been corrected and are ready to receive paving.
- D. Herbicide Treatment: Apply chemical weed control agent in strict compliance with manufacturer's recommended dosages and application instructions. Apply to compacted, dry sub grade.
 1. Allow to dry until at proper condition to receive paving.

3.2 PLACING MIX

- A. General: Place asphalt concrete mixture on prepared surface, spread and strike-off. Spread mixture at minimum temperature of 225 degrees Fahrenheit. Place inaccessible and small areas by hand. Place each course to required grade, cross-section and compact thickness.
- B. Paver Placing: Place in strips not less than 10' wide, unless otherwise acceptable to Architect. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips.
- C. Joints: Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density and smoothness as other sections of asphalt concrete course. Clean contact surfaces and apply tack coat.

3.3 ROLLING

- A. General: Begin rolling when mixture will bear roller weight without excessive displacement.
- B. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
- C. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.
- D. Second Rolling: Follow breakdown rolling as soon as possible warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.
- E. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot asphalt concrete. Compact by rolling to maximum surface density and smoothness.
- F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.4 TRAFFIC AND LANE MARKINGS

- A. Cleaning: Sweep and clean surface to eliminate loose material and dust.

- B. Lane / Parking Marking Paint: Paint Stripes shall be equal to KRYLON INDUSTRIAL LINE-UP PAINT SB Pavement Striping Paint for Parking Lots - Solvent-Based Pavement Striping alkyd paint or equal. Color: White at typical spaces, Blue at handicapped spaces and symbol.
- C. Apply paint with mechanical equipment to produce uniform straight edges. Apply in 2 coats at manufacturer's recommended rates.

3.5 FIELD QUALITY CONTROL

- A. General: Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by Architect.
- B. Thickness: In-place compacted thickness will not be acceptable if exceeding 1/4" from required thickness.
- C. Surface Smoothness: Test finished surface of each asphalt concrete course for smoothness, using 10' straight-edge applied parallel with, and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness.
 - 1. Base Course Surface: 1/4".
 - 2. Wearing Course Surface: 3/16"
- D. Check surface areas at intervals as directed by Architect.

3.6 TESTING

- 1. To be performed by independent lab paid by Owner, approved by Architect.
- 2. Before delivery Bituminous Binder and Wearing Course Materials shall be tested by Lab at Suppliers production plant.
- 3. Testing shall verify that all samples meet ALDOT specifications.
- 4. Test reports sent to Architect, Owner, Contractor.

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

- A. 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

- A. Fiber Reinforcement:
 1. Fiber Force 500 (Fibril Pro) Micro synthetic Fiber Reinforcement by ABC Polymer Industries or Equal.
 2. Add to concrete mix at 1.5 pounds per cubic yard of concrete.
 3. Finishing: Broom finish; pull broom in one direction such that fibers lay down.
 4. Locations for Use: All concrete sidewalks, paving and handicap ramps.
- B. Steel reinforcement if required shall be 6 x 6 #10/10 W.W.M. unless noted otherwise.
- C. 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 02660 - WATER DISTRIBUTION SYSTEM

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. The work includes construction of the water distribution system including fire lines as shown on the Drawings.
- B. Testing and disinfection of the installed system shall be incidental to the work.

1.3 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: Comply with applicable codes, ordinances, rules, regulations, and laws of local, municipal, state or federal authorities having jurisdiction.
- B. Meet all requirements of the Local Water Authority and be subject to review by System inspectors.

1.4 SITE CONDITIONS

- A. Coordinate water distribution system with pavement construction.
- B. Install water mains when grade is within 6 in. of final grade.
- C. Coordinate the Work with the Local Water Authority and pay all tap fees assessed (to include valves, backflow preventers, vaults, etc.) for portions of the Work completed by the Utility Provider.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Water Main Piping:
 - 1. Water Service Piping: Ductile iron pipe or PVC pipe.
 - 2. Ductile Iron Pipe:
 - a. Manufactured in accordance with AWWA C-151, latest revision, Class 50, min.
 - b. Standard cement-lined and seal-coated with an approved bituminous seal coat in accordance with AWWA C-104, latest revision.
 - c. Approved push-on, conforming to AWWA C-111, latest revision.
- B. PVC Pipe:
 - 1. Constructed to meet the requirements of U. S. Department of Commerce Product Standard PS 22-70, and bear the National Sanitation Foundation Testing Laboratories, Inc., seal for potable water.
 - 2. For PVC piping less than 4" - Schedule 40, PVC, minimum; 150 psi minimum working pressure
 - 3. 4" or greater shall be C900 PVC piping.
- C. Fire Line:
 - 1. Fire line shall be C900 PVC piping. Encasement shall be used under drive areas.
 - 2. Connection to Main: Each hydrant shall be connected to the main pipe with a 6-inch ductile iron branch. Each hydrant shall be controlled by an independent 6-inch gate valve.
- D. Fire Hydrants:

1. All hydrants shall be Mueller Company, M & H, or an approved equal. Fire hydrants shall be equipped with traffic break away feature. Hydrants shall be painted in accordance with the requirements of AWWA C502.

E. Water Main Fittings:

1. Ductile iron fittings shall be provided in locations as shown on the plans or in locations deemed necessary by the Engineer. Ductile iron fittings 12" and smaller shall be rated for 350 psi working pressure. Fittings shall be manufactured in accordance with AWWA C153 and provided with mechanical joints. All fittings shall be provided with a thin cement lining in accordance with AWWA C104.
2. PVC Fittings: Fittings For PVC Water Mains Smaller Than 6 In. In. Dia.: As recommended by the manufacturer of the pipe furnished, suitable for use under the conditions specified for the pipe, with ring-tite or fluid-tite bells or spigots at all ends for jointing.

F. Valves and Boxes:

1. Cast Iron Valve Boxes shall be provided for all valves installed vertically and shall consist of a base covering the operating nut and head of the valve, a vertical shaft of at least 5 1/4" in diameter and a top section extending to a point even with the finish ground surface, provided with a cast iron cover marked "WATER." The valve box shall be placed concentrically over the operating nut. Precast concrete collars shall be provided around each valve box.
2. Valves 2" and Larger: Cast iron gate valves, AWWA type, the standard product of a recognized valve manufacturer such as Mueller, Iowa or M & H, constructed with an interchangeable parts system, with parts readily available, to meet the following requirements:
 - a. Iron body, bronze-mounted.
 - b. Double disc, parallel seat "O" ring seal.
 - c. 150 psi, min., working pressure.
 - d. Counterclockwise (left) opening.
 - e. 2 in. operating nut.
 - f. Non-rising stem.
 - g. Joints to be as required for pipe to be connected to.
3. Valves 2" and Smaller: Brass or bronze gate valves, conforming to Federal Specification WW-V-76.
4. Underground Valves: Two-piece, screw type, adjustable to suit the depth of bury and type of valve, with a min. shaft dia. of 5-1/4 in.
5. All mechanical joint valves and fittings shall be restrained by MEGALUG series 1100 restraint devices.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Line and Grade: Lay and maintain to the required lines and grades; with fittings, valves and hydrants at the required locations; and with joints centered and spigots plumb; and with all valve and hydrant stems plumb.
- B. Encasement: Piping under paved drive shall be encased with welded steel pipe casing.
- C. Laying Pipe:
 1. General: Before lowering pipe into trenches, grade the bottom of the ditch so that when pipe is in the ditch it will have a bearing for its entire length. Examine the pipe for defects and clean the inside. After placing pipe in ditch, wipe the bell, gasket, and spigot free from all dirt, sand and foreign material. Apply a film of lubricant to the gasket and spigot. Enter the plain

end into the socket after which force the pipe into the socket until it makes contact with the bottom of the socket.

2. A minimum of five (5) feet horizontal separation shall be used when installing water main or piping within areas of sanitary sewer lines. When the proposed water main or piping is required to cross sewer mains, the contractor shall encase the water main carrier pipe with a continuous pipe (sleeve or casing) of sufficient length, located such that a minimum five (5) foot horizontal separation exists between each end of the casing pipe and the sewer main. Where possible, water main shall be a minimum of 18 inches above the top elevation of the sewer main.
 3. No. 12 THW copper locator wire shall be placed in the trench, 12 inches above the water mains and all service piping.
 4. Trench Water: At times when pipe laying is not in progress, close the open ends of pipe by approved means, and permit no trench water to enter the pipe.
- D. Cutting Pipe: Cut pipe for inserting valves, fittings or closure pieces in a neat and workmanlike manner without damage to the pipe.
- E. Direction of Laying: Unless otherwise directed, lay pipe with bell ends facing in the direction of laying. For lines on an appreciable slope, face bells upgrade.
- F. Permissible Deflections: Wherever necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructing, to plumb stems, or where long radius curves are permitted, deflect as recommended by the manufacturer of the pipe.
- G. Unsuitable Conditions: Lay no pipe in water or when the trench conditions or weather is unsuitable for such work.
- H. Provide ground cover of 3 ft. min.
- I. Setting Appurtenances:
1. Valves and Fittings: Set gate valves and pipe fittings to new pipe in the manner previously specified for cleaning, laying and jointing pipe.
 2. Valve Boxes: Firmly support cast iron valve boxes and maintain centered and plumb over the wrench nut of the gate valve, with box cover flush with the surface of the finished pavement or at such other level as may be directed.

3.2 FIELD QUALITY CONTROL

- A. Hydrostatic Tests: Pressure During Test: After the pipe has been laid and partially backfilled as specified, pressure test all newly laid pipe, or any valved section of it, in accordance with Local required procedures.

3.3 CLEANING AND DISINFECTION

- A. Clean out and thoroughly flush the water distribution system piping and leave free from foreign materials of any sort prior to sterilization.
- B. Disinfect in accordance with Local required procedures and AWWA Standard C-651, latest edition.

END OF SECTION

SECTION 02720 - STORM SEWERS

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 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: Comply with applicable codes, ordinances, rules, regulations, and laws of local, municipal, state or federal authorities having jurisdiction.
- B. All locations including total jobsite: All storm drainage shall be in accordance with Local Requirements.

1.3 SUBMITTALS

- A. Submit manufacturer's data, test reports, material certifications as required.

1.4 SITE CONDITIONS

- A. Protection of Existing Utilities: Protect existing power lines, water mains, gas lines, telephone lines and other utilities. Should any functioning underground utilities be uncovered during the Work, advise for determination as to whether or not they are to be removed. Repair any damage to utility lines and restore service to original condition.
- B. Coordination and Scheduling of Work:
 - 1. Coordinate work with earthwork operations to avoid interference. Protect established construction stakes.
 - 2. Establish and maintain center-lines, grades and elevations.
 - 3. Construction of new sewers and drainage systems shall proceed as early in construction program as possible. Maintain adequate drainage of the project area at all times. Prevent flooding of adjacent roads and private properties.
- C. Temporary Drainage: Wherever possible, construct new sewers and inlets to serve the various drainage areas, and place in service. Where this is not possible, provide temporary drainage facilities as required. These may include temporary connections into completed sewers, or such other means as the circumstances may require.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Storm Drain Pipe Materials:
 - 1. The Contractor shall have the following options for pipe material:
 - a. Class III reinforced concrete, meeting the requirements of ASTM C76 with tongue and groove joints unless indicated otherwise in the drawings.
 - b. Contech A-2000 PVC Pipe.
 - c. ADS N-12 HDPE
 - 2. Use ductile iron where indicated on the drawings.
- B. Appurtenance Material:
 - 1. Brick:
 - a. Clay or Shale Brick: Comply with ASTM C 32 for Sewer Brick and Manhole Brick, grade as selected.
 - b. Concrete Masonry Units: Comply with ASTM C 139.

2. Mortar: Comply with ASTM C 270, Type M, for pipe joints and man- hole and inlet brickwork.
3. Concrete:
 - a. Concrete for use in precast concrete catch basins, curb inlets, drop inlets and manholes shall be 3000 psi at age 28 days.
4. Reinforcement: Comply with ASTM A 615.
5. Castings: Comply with ASTM A 48, grey cast-iron.
6. Riprap: Riprap shall be Class I conforming to Section 814 of the State of Alabama Highway Department Standard Specifications.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Storm Drainage System: Construct drainage structures and appurtenances in accordance with applicable standard drawings and construction details shown on the Drawings.
- B. Lay all pipe in an open trench of dimensions as given below:
 1. Lengths of storm drain pipe shown on the Drawings are approximate distances center-to-center of structures. Install pipe based on actual field measurements.
- C. Excavation:
 1. Excavation is open cut. The top portion of trenches may be excavated as required by the Contractor to any width which will not cause damage to adjacent structures. The lower portion of the trench, to a height of 1 ft. above the top of the pipe shall not exceed 18 in. greater than the pipe dia.
 2. All excavation shall be prosecuted in accordance with requirements of OSHA "Safety and Health Regulations for Construction".
 3. When sheeting or shoring is used, widths may be increased by the thickness of the timbers. All protective measures required are the responsibility of the Contractor and shall be provided at the Contractor's expense.
 4. Carefully shape the bottom of trenches to conform to and support the lower 1/4 of the periphery of the pipe barrel. At the Contractor's option, trenches may be excavated slightly over depth, and then the pipe bed may be constructed of approved granular material, thoroughly tamped and carefully shaped to conform to and support the lower 1/4 of the periphery of the pipe barrel. Where rock is encountered, remove to a depth of 6 in. below the pipe and replace with an approved granular material.
 5. Where suitable material, such as muck, is encountered at or below invert elevation during excavation, remove and replace with suitable material, or stabilize by the addition of a granular material.
- D. Pipe Laying:
 1. Proceed upgrade where practicable. Lay pipe shall true to grade and line with a straight and uniform invert. Do not lay pipe in a wet or muddy trench. Dewater trenches as required with firm, smooth and properly shaped bed as specified.
 2. Lay corrugated metal pipe so that if invert paving has been damaged, repair with an asphaltic compound to the satisfaction of the Engineer.
 3. Joints for reinforced concrete pipe shall be with sand-cement grout.
- E. Backfilling:
 1. Backfill with selected material, free from rock larger than 2 in. in size, or debris.

2. Carefully place backfill and tamp around and over the pipe to avoid displacement of the pipe or damage to the joints.
3. Place all backfill in 6 in. lifts and compact as required in EARTHWORK Section. Compaction methods shall be at the Contractor's option as long as the desired results are obtained; otherwise, the Architect may order changes in methods or equipment.

F. Appurtenances and Drainage Structures:

1. Furnish and install drainage structures as shown in detail on the Drawings. Install shaped inverts.
2. Fill all mortar joints full. Tool all joints.
3. Cut and grind all pipe, where cut at face of structure wall, smooth with the face of the wall. Pack full all joints around pipe and structure wall at the face of the wall with mortar.
4. Clean bottom of drainage structures of all debris, and wipe walls clean of mortar as work progresses.
5. Construct catch basin tops true to line and grade, and slope continuous with gutter.
6. Install cast iron steps in all structures over 4 ft. deep, installed 15 in. o.c. in a vertical direction. Cast iron steps and manhole rings and covers shall meet ASTM A 48.
7. Construct junction boxes with bottom as shown in details for drop inlets, catch basins or other structures. Construct tops to accommodate a standard manhole ring, and adjust over to grade.
8. Where indicated in the Storm Structure Schedule, drainage basins by Contech or Nyloplast may be used.

3.2 ADJUSTING AND CLEANING

- A. At completion, remove all excess materials, debris, etc. resultant from operations of this Section of Work.
- B. Leave drainage systems clean and free from mud or debris of any kind. When looked through, each line between structures shall show a full circle of light; otherwise the Contractor shall be required to remove and replace the defective portion of the work, at the Contractor's expense.

END OF SECTION

SECTION 02730 - SANITARY SEWERS

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 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: Comply with applicable codes, ordinances, rules, regulations and laws of local, municipal, state or federal authorities having jurisdiction.
- B. Sanitary sewer construction is subject to review and acceptance by the Local Sewer Department and shall meet their requirements.

1.3 SITE CONDITIONS

- A. Coordinate sanitary sewer construction with grading operations to avoid deep trench conditions insofar as possible.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Pipe: Type as shown Drawings.
 - 1. PVC Pipe:
 - a. Gravity Pipe – Plastic pipe for gravity sewers, stacks and laterals, and fittings shall be unplasticized polyvinyl chloride (PVC), meeting or exceeding ASTM Specification D3034, latest edition, Classification SDR 35.
 - b. Force Main Pipe – PVC pipe for force mains shall conform to the requirements of ASTM D2241 for pressure pipe or AWWA C900. Pipe shall be Class 150 with a Standard Dimension Ratio of 18 or heavier.
 - c. All sanitary sewer PVC pipe shall be either green or brown in color.
- B. Appurtenances:
 - 1. Manholes: Precast concrete units conforming to ASTM 478.
 - 2. Castings: Grey cast iron conforming to ASTM A 48.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Trenching and Excavation:
 - 1. Excavate in open trench to the width, depth and in the direction necessary for the proper construction of the pipe sewer according to the Drawing.
 - 2. Shape the bottom of the trench so as to conform as nearly as possible to the outside of the pipe, particular care being taken to recess the bottom of the trench in such a manner as to relieve the bell of the pipe of all load.
 - 3. Build pipe sewers in a trench, the width of which at the top of the pipe shall not exceed the external dia. of the bell of the pipe, plus 12 in. each side, unless otherwise directed by the Engineer, but in no case less than 24 in. in width.
 - 4. All excavation shall be performed in accordance with requirements of OSHA "Safety and Health Regulations for Construction".

B. Backfilling:

1. The sanitary sewer pipe shall be bedded in a crushed stone bench bottom installed to a minimum depth below the pipe of six (6) inches. After the pipe is installed, the trench shall be backfilled with crushed stone to a depth of one-half the pipe diameter for depths of cut of 12 feet or less. For depths of cut greater than 12 feet the pipe shall be backfilled with crushed stone to a height of 6" above the top of the pipe.
2. No. 12 THW copper locator wire shall be placed in the trench, 12 inches above the sewer mains and all sewer service piping.
3. Backfill all trenches and excavation immediately after the pipes are laid therein unless other protection for the pipe line is directed. The backfilling material shall be selected and deposited with special reference to the future safety of the pipes. Solidly tamp clean earth, sand or rock dust about the pipe up to the level of 6 in. above the top of the pipe, and carefully deposit in uniform layers, each layer solidly tamped or rammed with proper tools so as not to disturb or injure the pipe line. Mechanical means may be permitted for backfilling, provided the equipment meets the approval of the Architect. Faithfully ram or tamp the remainder of the backfilling of the trenches in layers of not more than 6 in. in depth with either approved mechanical or hand tamps. Compaction shall conform to the requirements of the EARTHWORK Section.
4. All backfilling material shall be free from rock, trash and debris.

C. Laying Pipe

1. Lay pipe with joints close and even, butting all around, special care being taken that there is no sagging at the hub, and that a true surface is given to the invert throughout the entire length of the sewer.
2. Water in Trenches: Do not use sewers for draining water from ditch. Provide and operate pumps, if necessary, to remove water from trench while pipe is being laid and joints made.

D. Jointing Pipe:

1. In jointing gasket pipe, clean both the bell and the spigot before the gasket is applied. Use the proper size gasket for each size of pipe, and lubricate only with a lubricant recommended by the manufacturer of the pipe. Insert the spigot end in the bell the proper distance, and take care to see that the pipe remains in this position.
2. Clean all joint material that may be left on the inside, and leave the pipe clean and smooth throughout. At every third pipe, fill around immediately after being properly placed and jointed to prevent the moving of joints.
3. Free the interior of the pipe of all dirt and superfluous material of every description, as the work proceeds.

E. Manholes:

1. Manholes shall be precast concrete conforming to ASTM 478. Shape inverts and build of concrete.

3.2 FIELD QUALITY CONTROL

- A. Testing: Perform Required Test as required by Local Authority.

3.3 ADJUSTING AND CLEANING

- A. Clean and clear sanitary sewers of materials of all kind.

END OF SECTION

SECTION 02789 – SYNTHETIC TURF AND DRAINAGE FIELD – (BASEBALL/SOFTBALL FIELDS)

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 SCOPE OF WORK

- A. The General Contractor shall prepare the field to sub-grade level (containing any electrical conduit, boxes, irrigation piping, concrete pads, etc.) prior to the installation of the drainage field and surface materials specified herein. This Contractor shall coordinate all work with the General Contractor prior to installation.
- B. It shall be the responsibility of the turf contractor to provide all labor, materials, equipment and tools necessary for the complete installation of a synthetic grass system, with a specially formulated resilient infill component and a porous vertical drainage stone base. The tufted infill system and the porous vertical drainage system shall consist of, but not necessarily be limited to, the following:
 - 1. A complete synthetic grass system, consisting of a nominal 2" minimum, 100% Parallel Slit Film fibers, spined tufted into a primary backing with a secondary backing. The backing will be perforated to ensure positive drainage.
 - 2. A resilient infill system consisting of rubber granules and sand, specifically designed to provide the feel, performance, and safety of an optimally maintained natural grass surface. The finished surface shall have the planarity and subtle undulations normally associated with typical natural grass athletic fields.
 - 3. A vertical draining field base consisting of a compacted layer of Open Graded Stone (OGS) with a under-drain system installed above a geo-textile membrane. The end of the drains are placed directly into the perimeter trench system containing a properly sized perforated pipe covered with free draining stone that discharges into a designated storm water outlet.
 - 4. The artificial turf shall be specifically designed, manufactured and installed for the intended sports and events. Typically sports include, but are not limited to football.
 - 5. Acceptance of prepared sub-base.
 - 6. Coordination with related trades to ensure a complete, integrated, and timely installation: Aggregate base course, sub-base material (tested for permeability), grading and compacting, piping and drain components (when required); as provided under its respective trade section.
 - 7. All bidders and/or turf contractors must directly employ the installers of the synthetic grass, layered infield systems and base. Subcontractors shall NOT be acceptable for the synthetic grass, infill system and or base installation.

1.3 REFERENCE STANDARDS

- A. FM Factory Mutual
 - 1. P7825 - Approval Guide; Factory Mutual Research Corporation; current edition
- B. ASTM – American Society for Testing and Materials.
 - 1. D1577 - Standard Test Method for Linear Density of Textile Fiber
 - 2. D5848 - Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Covering
 - 3. D1338 - Standard Test Method for Tuft Bind of Pile Yarn Floor Covering
 - 4. D1682 - Standard Method of Test for Breaking Load and Elongation of Textile Fabrics
 - 5. D5034 - Standard Test Method of Breaking Strength and Elongation of Textile Fabrics (Grab Test)
 - 7. D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity

1.4 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate field layout; field marking plan and details for the specified sports; i.e., NCAA Baseball / Softball; roll/seaming layout; methods of attachment, field openings and perimeter conditions.
 - 2. Show installation methods and construction indicating field verified conditions, clearances, measurements, terminations, drainage.
 - 3. Provide joint submission with related trades when requested by Architect.
- B. Product Data:
 - 1. Submit manufacturer's catalog cuts, material safety data sheets (MSDS), brochures, specifications; preparation and installation instructions and recommendations; storage, handling requirements and recommendations.
 - 2. Submit fiber manufacturer's name, type of fiber and composition of fiber.
 - 3. Submit name and address of the cryogenic infill supplier/manufacturer
 - 4. Submit data in sufficient detail to indicate compliance with the contract documents.
 - 5. Submit manufacturer's instructions for installation.
 - 6. Submit manufacturer's instructions for maintenance for the proper care and preventative maintenance of the synthetic turf system, including painting and markings.
- C. Samples:
 - 1. Submit samples, 2 - 12 x 12 inches, illustrating details of finished product in amounts as required by General Requirements, or as requested by Architect.
- D. Product Certification:
 - 1. Submit manufacturer's certification that products and materials comply with requirements of the specifications.
 - 2. Submit test results indicating compliance with Reference Standards.
- E. Project Record Documents: Record actual locations of seams, drains and other pertinent information in accordance with Specifications, General Requirements.
- F. List of existing installations: Submit list including respective Owner's representative and telephone number.
- G. Warranties: Submit warranty and ensure that forms have been completed in Owner's name and registered with approved manufacturer.
- H. Submit Bills of Lading/Material Delivery Receipts for synthetic turf infill materials. Bills of lading shall bear the name of the project/delivery address, quantity of materials delivered, source/location of origin of infill materials and/or manufacturer, and date of delivery.
- I. Testing Certification: Submit certified copies of independent (third-party) laboratory reports on ASTM testing:
 - 1. Pile Height, Face Weight & Total Fabric Weight, ASTM D5848.
 - 2. Primary & Secondary Backing Weights, ASTM D5848.
 - 3. Tuft Bind, ASTM D1335.
 - 4. Grab Tear Strength, ASTM D1682 or D5034.
 - 5. Water Permeability, ASTM D4491

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section. The turf contractor and/or the turf manufacturer:

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Baldwin County Board of Education
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1. Shall be experienced in the manufacture and installation of specified type of infilled slit-film grass system for a minimum of three years. This includes use of a slit-film fiber, backing, the backing coating, and the installation method.
 2. The manufacturer shall own and operate its own manufacturing plant. Manufacturing the fiber, tufting of the field fibers into the backing materials and coating of the turf system must be done in-house by the turf manufacturer.
 3. Shall have 100 fields in play for at least two years with a slit-film fiber. Fields shall be 65,000 ft² or more
 4. Shall have a minimum of 10 fields that are at least 8 years old, which is equal to the respective warranty period, with the same infill system.
 5. Shall have a minimum of 1 installation in the State of AL.
 6. Shall have a minimum of 25 installations in North America, each of 65,000 ft² or more. Fields shall be 65,000 ft² or more of the specified infill material and a slit-film fiber.
 7. The fiber and turf carpet being proposed must have a minimum documented Fiber Performance Index of at least 75.
 8. Shall provide third party certification confirming minimum requirement of 9 lbs tuft bind.
- B. Installer: Company shall specialize in performing the work of this section. The Contractor shall provide competent workmen skilled in this specific type of synthetic grass installation.
1. The designated Supervisory Personnel on the project shall be certified, in writing by the turf manufacturer, as competent in the installation of the turf system.
 2. Installer shall be certified by the manufacturer and licensed.
 3. The installer supervisor shall have a minimum of 5 years' experience as either a construction manager or a supervisor of synthetic turf installations .
- C. Pre-Installation Conference: Conduct conference at project site at time to be determined by Architect. Review methods and procedures related to installation including, but not limited to, the following:
1. Inspect and discuss existing conditions and preparatory work performed under other contracts.
 2. In addition to the Contractor and the installer, arrange for the attendance of installers affected by the Work, The Owner's representative, and the Architect.
- D. The Contractor shall verify special conditions required for the installation of the system.

The Contractor shall notify the Architect of any discrepancies.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Prevent contact with materials that may cause dysfunction.
- B. Deliver and store components with labels intact and legible.
- C. Store materials/components in a safe place, under cover, and elevated above grade.
- D. Protect from damage during delivery, storage, handling and installation. Protect from damage by other trades.
- E. Inspect all delivered materials and products to ensure they are undamaged and in good condition.
- F. Comply with manufacturer's recommendations.

1.7 SEQUENCING AND SCHEDULING

- A. Coordinate the Work with installation of work of related trades as the Work proceeds.
- B. Sequence the Work in order to prevent deterioration of installed system.

1.8 WARRANTY AND GUARANTEE

- A. The Contractor shall provide a warranty to the Owner that covers defects in materials and workmanship of the turf for a period of eight (8) years from the date of substantial completion. The infield "high-use" clay turf areas are under warranty for two (2) years where the remainder of the field is under warranty for 8 years. The turf manufacturer must verify that their representative has inspected the installation and that the work conforms to the manufacturer's requirements. The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, and acts of God beyond the control of the Owner or the manufacturer. The warranty shall be fully third party insured; pre-paid for the entire term and be non-prorated. The Contractor shall provide a warranty to the Owner that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's representative. Prior to final payment for the synthetic turf, the Contractor shall submit to owner notification in writing that the field is officially added to the annual policy coverage, guaranteeing the warranty to the Owner. The insurance policy must be underwritten by an "AM Best" A rated carrier and must reflect the following values:
1. Pre-Paid 8-year insured warranty.
 2. Insured Warranty Coverage must be provided in the form of 1 single policy
 3. Maximum per claim coverage amount of \$33,000,000.
 4. Minimum of thirty-three million dollar (\$33,000,000) annual aggregate
 5. Must cover full 100% replacement value of total square footage installed, minimum of \$7.00 per sq ft. (in case of complete product failure, which will include removal and disposal of the existing surface)
 6. Policies that include self insurance or self retention clauses shall not be considered.
 7. Policy cannot include any form of deductible amount.
 8. Sample policy must be provided at time of signed contract to prove that policy is in force. A letter from an agent or a sample Certificate of Insurance will not be acceptable.

1.9 MAINTENANCE SERVICE

- A. Contractor shall train the Owner's facility maintenance staff in the use of the turf manufacturer's recommended maintenance equipment.
- B. Manufacturer must provide maintenance guidelines and a maintenance video to the facility maintenance staff.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
- B. FieldTurf; www.fieldturf.com; Craig Yancey, Regional Sales Manager, (205)908-5608; Calhoun, Georgia. (Basis of Design)
1. **DoublePlay Speed** by FieldTurf.
- AND**
2. **DoublePlay Natural** by FieldTurf.
- C. AstroTurf; www.astroturf.com; Contact: Zack Riddleberger (336)238-9060; email:zriddleberger@astroturf.com
- D. Sprinturf, LLC; www.sprinturf.com; Charlie Welsh, (651)239-0400; Daniel Island, SC 29492.
- E. Shaw Sports Turf; Legion; www.shawsportsturf.com; 185 South Industrial Boulevard, Calhoun, Georgia, 30701; Contact Wynn Vinson: Phone: 601.416.4767; Email:

wynn.vinson@shawinc.com.

- F. Hellas Construction; www.hellasconstruction.com; www.matrix-turf.com; 12710 Research Blvd. Suite 240, Austin, TX, 78759.
- G. 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. Additionally, submit for approval a 12 inch by 12-inch sample, detailed specifications, and a complete material testing of the synthetic grass to be used on this project. The Architect will notify all material manufactures in writing of specification and product approval, prior to the bid opening. All manufactures shall include a sample manufacturer's warranty with request for approval.

2.2 MATERIALS AND PRODUCTS

A. INFIELD CLAY AREAS

- 1. Artificial grass system materials shall consist of the following:
 - a. All designs, markings, layouts, and materials shall conform to all currently applicable National Federation or NCAA rules and other standards that may apply to this type of synthetic grass installation.
 - b. Carpet made of slit-film polyethylene fibers tufted into a porous backing.
 - c. Infill: Controlled mixture of graded sand and natural infill that partially covers the carpet.
 - d. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass slit-film.
 - e. Removable home plate area and pitcher's mound landing strip, Velcro must be sewn on to the perimeter of each removable piece in addition to each removable piece having a strengthened backing layer designed to improve cleat puncture resistance.
- 2. The installed artificial grass slit-film shall have the following properties:

| <u>Standard</u> | <u>Property</u> | <u>Specification</u> |
|-----------------|----------------------------|----------------------|
| | Yarn Structure – A | Slit-Film |
| ASTM D1577 | Yarn Denier - A | 10,800 |
| | Yarn Structure – B | Thatch |
| | Yarn Denier – B | 5.000 |
| ASTM D5823 | Pile Height | 1.6” |
| ASTM D5793 | Stitch Gauge | 3/8” |
| ASTM D5848 | Pile Weight | 50oz/square yard |
| ASTM D5848 | Primary Backing | 7+oz/square yard |
| ASTM D5848 | Secondary Backing | 20+oz/square yard |
| ASTM D5848 | Total Weight | 77+oz/square yard |
| ASTM D1335 | Tuft Bind (Without Infill) | 8+ lbs |
| ASTM D5034 | Grab Tear (Width) | 200 lbs/force |
| ASTM D5034 | Grab Tear (Length) | 200 lbs/force |
| ASTM D4491 | Carpet Permeability | >40 inches/hour |
| | Sand Infill Component | 3.5 lbs/square foot |
| | Natural Infill Component | 1.5lbs/square foot |
| | Total Product Weight | 797oz/square yard |

Variation of +/- 5% on above listed properties is within normal manufacturing tolerances

- 3. Carpet Rolls shall be 15' wide rolls.

New Softball Complex at
Daphne High School for the
Baldwin County Board of Education
Daphne, Alabama

SYNTHETIC TURF AND DRAINAGE FIELD
02789-5

4. Backing:
 - a. Primary backing shall be a double-layered polypropylene fabric
 - b. Secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
 - c. Perforated (with punched holes), backed carpet are acceptable.
5. Infill materials shall be approved by the manufacturer.
 - a. Infill shall consist of a resilient layered granular system, comprising selected and graded sand and natural infill.
 - b. Artificial Grass products without sand and natural infill material will not be acceptable.
 - c. Natural infill material must be non-buoyant with a specific gravity of >1 and a bulk density of >0.55 g/cm³.
 - d. Natural infill material must be predominantly a 10-30 mesh size.
 - e. Natural infill material must be sourced and granulated in the United States.
 - f. Natural infill material that requires irrigation for maintenance or performance is unacceptable.
6. The sand infill will comply within the following characteristics:
 - a. Average Particle size between 20 and 30 mesh [calculated based on summing the midpoint of sieve pan fractions times the % retained on given screen fractions]
 - b. Average Particle shape > 0.4 on the Krumbein scale
 - c. Particle structure predominantly single grain
 - d. Produce < 0.4%, -50M in API crush test at 80psig
7. Non-tufted or inlaid lines and markings shall be painted with paint approved by the synthetic turf manufacturer.
8. Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic turf manufacturer.

B. INFIELD GRASS AREA

1. Artificial grass system materials shall consist of the following:
 - a. All designs, markings, layouts, and materials shall conform to all currently applicable National Federation or NCAA rules and other standards that may apply to this type of synthetic grass installation.
 - b. Carpet made of slit-film and monofilament polyethylene fibers tufted together into each individual stitch, into a non-perforated backing. Alternating row monofilament and slit-film carpet constructions are not permitted.
 - c. Infill: Controlled mixture of graded sand and cryogenic SBR rubber crumb that partially covers the carpet.
 - d. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass slit-film/monofilament.
2. The installed artificial grass slit-film shall have the following properties:

| <u>Standard</u> | <u>Property</u> | <u>Specification</u> |
|-----------------|--------------------|----------------------------|
| ASTM D1577 | Pile Yarn Type | UV- Resistant polyethylene |
| | Yarn Structure – A | Slit-Film |
| | Yarn Denier - A | 5,000 |
| | Yarn Structure – B | Ridged Monofilament |

| | | |
|------------|--------------------------------|---------------------|
| | Yarn Denier – B | 14,500 |
| ASTM D5823 | Pile Height | 2” |
| ASTM D5793 | Stitch Gauge | 3/4” |
| ASTM D5848 | Pile Weight | 39oz/square yard |
| ASTM D5848 | Primary Backing | 7+oz/square yard |
| ASTM D5848 | Secondary Backing | 20+oz/square yard |
| ASTM D5848 | Total Weight | 60+oz/square yard |
| ASTM D1335 | Tuft Bind (Without Infill) | 8+ lbs |
| ASTM D5034 | Grab Tear (Width) | 200 lbs/force |
| ASTM D5034 | Grab Tear (Length) | 200 lbs/force |
| ASTM D4491 | Carpet Permeability | >40 inches/hour |
| | Sand Infill Component | 5.4 lbs/square foot |
| | Cryogenic SBR Infill Component | 1.5lbs/square foot |
| | Total Product Weight | 1054oz/square yard |

Variation of +/- 5% on above listed properties is within normal manufacturing tolerances

3. Carpet Rolls shall be 15' wide rolls.
4. Backing:
 - a. Primary backing shall be a double-layered polypropylene fabric
 - b. Secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
 - c. Perforated (with punched holes), backed carpet are acceptable.
5. Infill materials shall be approved by the manufacturer.
 - a. Infill shall consist of a resilient 3-layered granular system, comprising selected and graded dust-free silica sand and SBR cryogenic rubber crumb.
 - b. Artificial Grass products without SBR cryogenic rubber will not be acceptable.
6. Non-tufted or inlaid lines and markings shall be painted with paint approved by the synthetic turf manufacturer.
7. Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic turf manufacturer.

C. OUTFIELD GRASS AREA

1. Artificial grass system materials shall consist of the following:
 - a. All designs, markings, layouts, and materials shall conform to all currently applicable National Federation or NCAA rules and other standards that may apply to this type of synthetic grass installation.
 - b. Carpet made of slit-film and monofilament polyethylene fibers tufted tufted together into each individual stitch, into a non-perforated backing. Alternating row monofilament and slit-film carpet constructions are not permitted.
 - c. Infill: Controlled mixture of graded sand and ambient rubber that partially covers the carpet.
 - d. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass slit-film/monofilament .

2. The installed artificial grass slit-film shall have the following properties:

| <u>Standard</u> | <u>Property</u> | <u>Specification</u> |
|-----------------|--------------------------------|----------------------------|
| | Pile Yarn Type | UV- Resistant polyethylene |
| | Yarn Structure – A | Slit-Film |
| ASTM D1577 | Yarn Denier - A | 5,000 |
| | Yarn Structure – B | Ridged Monofilament |
| | Yarn Denier – B | 12,000 |
| ASTM D5823 | Pile Height | 2" |
| ASTM D5793 | Stitch Gauge | 3/4" |
| ASTM D5848 | Pile Weight | 39oz/square yard |
| ASTM D5848 | Primary Backing | 7+oz/square yard |
| ASTM D5848 | Secondary Backing | 16+oz/square yard |
| ASTM D5848 | Total Weight | 62+oz/square yard |
| ASTM D1335 | Tuft Bind (Without Infill) | 8+ lbs |
| ASTM D5034 | Grab Tear (Width) | 200 lbs/force |
| ASTM D5034 | Grab Tear (Length) | 200 lbs/force |
| ASTM D4491 | Carpet Permeability | >40 inches/hour |
| | Sand Infill Component | 3.65 lbs/square foot |
| | Cryogenic SBR Infill Component | 2.6lbs/square foot |
| | Total Product Weight | 962oz/square yard |

Variation of +/- 5% on above listed properties is within normal manufacturing tolerances

3. Carpet Rolls shall be 15' wide rolls.
4. Backing:
- Primary backing shall be a double-layered polypropylene fabric.
 - Secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
 - Perforated (with punched holes), backed carpet are acceptable.
5. Infill materials shall be approved by the manufacturer.
- Infill shall consist of silica sand and ambient rubber.
Artificial Grass products without ambient rubber will not be acceptable.
6. Non-tufted or inlaid lines and markings shall be painted with paint approved by the synthetic turf manufacturer.
7. Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic turf manufacturer.

2.3 QUALITY CONTROL IN MANUFACTURING

- The manufacturer shall own and operate its own manufacturing plant in North America. Both tufting of the field fibers into the backing materials and coating of the turf system must be done in-house by the turf manufacturer. Outsourcing of either is unacceptable.
- The manufacturer shall have full-time certified in-house inspectors at their manufacturing plant that are experts with industry standards.

- C. The manufacturer's full-time in-house certified inspectors shall perform pre-tufting fiber testing on tensile strength, elongation, tenacity, denier, shrinkage, and twist i.e., turns per inch, upon receipt of fiber spools from fiber manufacturer.
- D. Primary backing shall be inspected by the manufacturer's full-time certified in-house inspectors before tufting begins.
- E. The manufacturer's full-time in-house certified inspectors shall verify "pick count", yarn density in relation to the backing, to ensure the accurate amount of face yarn per square inch.
- F. The manufacturer's full-time, in-house, certified inspectors shall perform turf inspections at all levels of production including during the tufting process and at the final stages before the turf is loaded onto the truck for delivery.
- G. The manufacturer shall have its own, in-house laboratory where samples of turf are retained and analyzed, based on standard industry tests, performed by full-time, in-house, certified inspectors.
- H. The manufacturer must have ISO 9001, ISO 14001 and OHSAS 18001 certifications demonstrating its manufacturing efficiency with regards to quality, environment and safety management systems.

2.4 QUALITY CONTROL IN FIBER MANUFACTURING

- A. Synthetic turf fiber must perform in a uniform manner or manufacturer quality control issues in the extrusion processes will be suspected. Linear Low Density Polyethylene Polymer ("LLDPE") and batch additives obtained from a reputable manufacturer are required to manufacture superior quality yarn. The master batch formula must include a UV stabilizer package added to its polymer base.
- B. The LLDPE used to make the artificial grass fiber needs to be a "C6" LLDPE which contains 6 carbon atoms and 12 hydrogen atoms; A C6-based LLDPE produces strong and resilient artificial grass fibers over prolonged periods and thus should provide the basis for long term performance of the system.
- C. Adequate UV protection is essential to the long-term durability of any artificial grass fiber. Typically, stabilizer packages for polyethylene fibers have three components that protect the fibers from degradation: (1) primary antioxidants; (2) secondary antioxidants; and (3) UV stabilizers (i.e., hindered amine light stabilizers ("HALS")). HALS are a particularly important aspect of the stabilizer package. A typical HALS concentration is 10,000 ppm. More developed HALS molecules are methyl stabilized to prevent from degradation.
- D. The fiber must contain both a short-term and a long-term active ingredient for protection during the extrusion process and when installed in the field. The pigments used in the fiber must be UV stable and heavy metal free.
- E. Artificial turf fiber proposed for the field(s) must have successfully undergone a Lisport wear test as part of Penn State University's fiber wear testing program. This fiber must be exactly the same fiber that is being proposed for the field(s). Official Penn State test reports must be provided.

2.5 FIELD GROOMER & SWEEPER

- A. **Contractor shall furnish a field groomer and sweeper as part of the work.**
 - 1. Field Groomer shall include a towing attachment compatible with a field utility vehicle.
 - 2. Field Groomer shall be a FieldTurf GroomRight
 - 3. Field Sweeper shall include a towing attachment compatible with a field utility vehicle.
 - 4. Field Sweeper shall be a FieldTurf FieldSweep

2.6 VERTICAL DRAINAGE BASE MATERIALS

- A. Excavation: Existing natural grass field shall be excavated to the depth as shown on the grading plan. The sub grade shall be shaped to achieve a .5% (one half of one percent) slope from the center of the field to each sideline in order to mirror the grade of the finished synthetic turf surface. The sub grade shall also be compacted and proof rolled to a minimum of a 95% compaction rate.

- B. Geotextile Filter Fabric:
- C. Non-woven polypropylene geotextile fabric shall be chemically and biologically inert and shall be equivalent to Mirafi, Mirafi Inc., Pendergrass, GA (888) 795-0808.
 - 1. Mirafi 140N or equal for Permeable applications
 - 2. Mirafi 500X or equal for Silty/Clayey Subgrades with fines content <35% and a PI<20.
 - 3. 16 Mil Woven Coated Polyethylene line for Impervious applications over moisture sensitive soils.
 - 4. Liner Selection to be made by Geotechnical Engineer of Record.
- D. Drainage Pipe: A network of perforated HDPE highway grade drainage pipe (1" x 12" flat panel pipe) shall be installed under a 6" layer of free draining base aggregate. The drainage pipe will be installed in a herringbone pattern every 15 feet on center and will be connected to perimeter collector lines. See Civil Drawings for complete drainage field requirements.
 - 1. ADS AdvanEdge, 800-821-6710 or Hydraway 2000.
 - 2. 1 inch by 12-inch flat drain.
 - 3. 8-inch diameter perforated collector drainpipe.

E. Stone Base Courses:

- 1. The following gradation of stone is proven and recommended when available in the vicinity of the project. The Base Contractor is required to focus on achieving the planarity, porosity and compaction requirements to provide a sound crushed stone base for synthetic turf installation.
- 2. The free-draining base aggregate base layer shall consist of a consistent depth of open graded material. Base drainage aggregate used must achieve a 95% minimum overall compaction rate. Material shall be similar to the ALDOT # 57 classification material. The open graded aggregate material shall conform to the following criteria:

| | | |
|-----------------|-------------------------|--------------------------------|
| Base Aggregate: | Open Graded Stone (OGS) | |
| | Weight Passing | Approximate Percentage Passing |
| 2" Sieve | 36.99 | 100.0% |
| 3/4" Sieve | 34.04 | 92.0% |
| 3/8" Sieve | 21.5 | 58.0% |
| #4 Sieve | 9.34 | 25.0% |
| #16 Sieve | 203.3 grams | 9.2% |

- 3. The choker material shall be a clean washed screenings meeting the Turf Contractor's approval. Material shall be similar to the ALDOT # 89 classification material.

| | | |
|------------------|---------------------|--------------------------------|
| Choker Material: | (Porous Stone Sand) | |
| | Weight Passing | Approximate Percentage Passing |
| 3/8" Sieve | 579.3 grams | 100.0% |
| #4 Sieve | 561.5 grams | 96.8% |
| #8 Sieve | 420.0 grams | 72.0% |
| #16 Sieve | 260.1 grams | 45.0% |
| #30 Sieve | 148.8 grams | 25.0% |
| #50 Sieve | 74.9 grams | 13.0% |
| #100 Sieve | 29.9 grams | 5.0% |
| #200 Sieve | 14.7 grams | 2.0% |

PART 3 – EXECUTION

3.1 VERTICALLY DRAINING BASE

- A. The synthetic turf Base Contractor shall strictly adhere to the installation procedures outlined under this section. Any variance from these requirements must be accepted in writing, by the Turf Contractor's on-site representative, and submitted to the Architect/Owner, verifying that the changes do not in any way affect the warranty.
- B. Install geotextile fabric over excavated and prepared sub-grade in accordance Architect's recommendations. Provide a 36" minimum overlap at all seams. Fabric shall first be installed in the drainage trenches prior to installation of perimeter collector lines. After backfilling of all trenches is complete, the entire field shall be covered with fabric prior to the base aggregate application.
- C. Trenching, Drainage Pipe Installation and Backfilling: All piping shall be as specified and connected by couplers, plugs etc. Design of the drainage system for the Football Field shall be by this Contractor and accepted by the manufacture of the synthetic grass system prior to installation.
 1. The base grade shall be shaped to mirror the finished grade and approved by the Architect and/or Owner's Representative. The Base Contractor shall begin layout and trenching for the drainage network as indicated on the drainage plan and all details that apply. Collector lines shall be installed before lateral lines and shall begin with the deepest elevations. Collector lines shall be connected to discharge outlet at the onset of operations. Trenching progress shall work upward in elevation to allow for immediate discharge of water from the entire field in the event of a rainfall.
 2. No trenches, with or without pipe, shall be permitted, to remain unfilled overnight and/or while crews are not progressively working on site.
 3. All perimeter trenches must be dug in accordance with the field drainage plan details.
 4. After all collector and lateral lines have been installed, the Base Contractor shall repair any sub grade undulations prior to installing geotextile fabric.
- D. Concrete Header Curb and Pressure Treated Wood Turf Nailer: The synthetic turf perimeter fastening structure shall be installed before the drainage aggregate.
 1. The General Contractor shall furnish and install a 6" x 12" concrete header curb around the entire inside of the track at the football field, top of header of the curb shall be flush with track surface. Curb shall be installed in accordance with the manufactures requirements. The foundation of the concrete header curb shall be a compacted free draining aggregate. Future water entering the foundation shall have a free draining path directly to the perimeter collector pipe.
 2. Install a pressure treated wood 2" x 4" nailer. Pressure treated wood nailer shall be set below top of the curb as specified by means of a Tapcon or ramset every 12 inches. This shall be the responsibility of the Base Contractor.
- E. Base Drainage Aggregate: The installation of the base drainage aggregate shall only begin after the drainage pipe installation has been inspected and approved by Architect/Owner's Representative. Installation of the Free Draining Base Aggregate shall follow procedures that protect the base grade soils and drainage pipe. The drainage pipe network and its existing elevations shall not be disrupted through ground pressures from trucks, dozers or by any other means.
 1. The base grade subsoil shall be dry before undertaking the placement of base aggregate.
 2. Delivery trucks shall enter the field only from the designated entrance point. Base course stone shall be dumped closest to the entrance first and continuously worked towards the furthest point of the field. Extreme care must be taken not to disturb sub grade or drainage network.
 3. Track-type dozers shall push out the stone from behind the pile onto and toward the field center. Dozers shall only traffic the aggregate they are spreading.

4. Bulldozer blades shall be equipped with a laser-guided hydraulic system. Care shall be taken not to disturb or contact the base grade soils with the dozer blades or tracks. All equipment trafficking over the drainage aggregate shall insure there is a minimum depth of 4" of aggregate between the geotextile fabric and the dozer track ground contact position.
 5. When the aggregate spreading is completed, the surface shall be further-firmed by a 5-ton roller. Static vibration shall not be part of this process.
 6. The stone shall be left firm, but not over-compacted as to protect the porosity and drainage capabilities of the aggregate profile.
 7. After the drainage stone has been uniformly spread throughout the surface, the surface shall receive a final laser finished grade. This process shall be accomplished using a turf-type tractor, or lightweight grader, equipped with high flotation tires and a hydraulically controlled laser blade.
 8. The free-draining base course must be installed to a depth of 5 inches and shall be independently tested for an overall compaction rate of 95% proctor.
- F. Choker Levels: The base drainage stone final elevations shall mirror the proposed choker layer final grade material. Care shall be taken not to allow the coarser aggregate to surface into the profile or finished grade of the choker layer.
1. The choker layer shall be applied using high flotation grading equipment. The choker material shall be evenly spread throughout the proposed field surface to the final pre-pad or pre-turf elevations.
 2. After the choker material has been uniformly spread throughout the surface by the described method, the surface shall receive a final laser finish grade. This process shall be accomplished using a turf-type tractor, or lightweight grader, equipped with high flotation tires and a hydraulically controlled laser blade.
 3. Care shall be taken throughout the installation not to force the choker material into the porosity of the base aggregate below.
 4. Final choke layer must be graded by means of a laser within 0 to 1/2 inch from design grade. The finished surface tolerance must not exceed 1/4 inch over 10 feet in all directions. Base Contractor must provide a topographical survey with a minimum of 200 shots demonstrating finished grade meets all written requirements.
 5. Final layer of stone must be installed at a depth of one (1) inch. Finished aggregate base must be proof-rolled by means of 2- to 5-ton roller. The finished aggregate base must achieve an overall compaction rate of 95% proctor in accordance with ASTM D1557. It shall also be flush with top of pressure treated wood nailer.
 6. The Contractor is required to stringline the entire field every five feet to identify high and low spots. And identified high and low spots must be eliminated prior to installation of the synthetic turf.
- G. Base Acceptance: The Architect and/or Owner's Representative and Turf Contractor must jointly approve the base before turf installation can begin.
- H. Verify that all sub-base leveling is complete prior to installation.
- I. Installer shall examine the surface to receive the synthetic turf and accept the sub-base planarity in writing prior to the beginning of installation.
1. Acceptance is dependent upon the Contractors test results indicating compaction and planarity are in compliance with manufacturer's specifications.
 2. The surface shall be accepted by Installer as "clean" as installation commences and shall be maintained in that condition throughout the process.
- J. Compaction of the aggregate base shall be 95%, in accordance with ASTM D1557 (Modified Proctor procedure); and the surface tolerance shall not exceed 0-1/4 inch over 10 feet and 0-1/2" from design grade.

- K. Correct conditions detrimental to timely and proper completion of Work.
- L. Do not proceed until unsatisfactory conditions are corrected.
- M. Beginning of installation means acceptance of existing conditions.

3.2 EXAMINATION

- A. Verify that all sub-base leveling is complete prior to installation.
- B. Installer shall examine the surface to receive the synthetic turf and accept the sub-base planarity in writing prior to the beginning of installation.
 - 1. Acceptance is dependent upon the Owner's test results indicating compaction and planarity are in compliance with manufacturer's specifications.
 - 2. The surface shall be accepted by Installer as "clean" as installation commences and shall be maintained in that condition throughout the process.
- C. Compaction of the aggregate base shall be 95%, in accordance with ASTM D1557 (Modified Proctor procedure); and the surface tolerance shall not exceed 0-1/4 inch over 10 feet and 0-1/2" from design grade.
- D. Correct conditions detrimental to timely and proper completion of Work.
- E. Do not proceed until unsatisfactory conditions are corrected.
- F. Beginning of installation means acceptance of existing conditions.

3.3 PREPARATION

- A. Prior to the beginning of installation, inspect the sub-base for tolerance to grade.
- B. Sub-base acceptance shall be subject to receipt of test results (by others) for compaction and planarity that sub-base is in compliance with manufacturer's specifications and recommendations.
- C. Dimensions of the field and locations for markings shall be measured by a registered surveyor to verify conformity to the specifications and applicable standards. A record of the finished field as-built measurements shall be made.
- D. When requested by Architect, installed sub-base shall be tested for porosity prior to the installation of the slit-film turf. A sub base that drains poorly is an unacceptable substrate

3.4 INSTALLATION – GENERAL

- A. The installation shall be performed in full compliance with approved Shop Drawings.
- B. Only trained technicians, skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the approved installer supervisors, shall undertake any cutting, sewing, gluing, shearing, topdressing or brushing operations.
- C. the designated Supervisory personnel on the project must be certified, in writing by the turf manufacturer, as competent in the installation of this material, including sewing seams and proper installation of the Infill mixture.
- D. Designs, markings, layouts, and materials shall conform to all currently applicable National Collegiate Athletic Association rules, NFHS rules, and/or other rules or standards that may apply to this type of synthetic grass installation. Designs, markings and layouts shall first be approved by the Architect or Owner in the form of final shop drawings. All markings will be in full compliance with final shop drawings.

3.5 INSTALLATION

- A. Install at location(s) indicated, to comply with final shop drawings, Manufacturers / installer's instructions.
- B. The Contractor shall strictly adhere to specified procedures. Any variance from these requirements shall be provided in writing, by the manufacturer's on-site representative, and submitted to the Architect and/or Owner, verifying that the changes do not in any way affect the Warranty. Infill materials shall be approved by the manufacturer and installed in accordance with

the manufacturer's standard procedures.

- C. Carpet rolls shall be installed directly over the properly prepared aggregate base. Extreme care shall be taken to avoid disturbing the aggregate base, both in regard to compaction and planarity.
 - 1. Repair and properly compact any disturbed areas of the aggregate base as recommended by manufacturer
- D. Infill Materials:
 - 1. Infill materials shall be applied in numerous thin lifts. The turf shall be brushed as the mixture is applied. The infill material shall be installed to a depth determined by the manufacturer.
- E. Non-tufted or inlaid lines and markings shall be painted in accordance with turf and paint manufacturers' recommendations. Number of applications will be dependent upon installation and field conditions.
- F. Synthetic turf shall be attached to the perimeter edge detail in accordance with the manufacturer's standard procedures.
- G. Upon completion of installation, the finished field shall be inspected by the installation crew and an installation supervisor.

3.6 FIELD MARKINGS

- A. Any logos shall be either painted or inlaid according to artwork indicated on Drawings and in accordance with manufacturer's standard palette of turf colors.

3.7 ADJUSTMENT AND CLEANING

- A. Do not permit traffic over unprotected surface.
- B. Contractor shall provide the labor, supplies, and equipment as necessary for final cleaning of surfaces and installed items.
- C. All usable remnants of new material shall become the property of the Owner.
- D. The Contractor shall keep the area clean throughout the project and clear of debris.
- E. Surfaces, recesses, enclosures, and related spaces shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

3.8 PROTECTION

- A. Protect installation throughout construction process until date of final completion.

END OF SECTION

SECTION 02791 – HEAT REDUCING TOP DRESSING

PART 1 – GENERAL

1.0 GENERAL REQUIREMENTS

1.1 Related Documents

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this section.

1.2 Scope of Work

- A. Furnish all labor, tools, and equipment necessary to install, in place, all synthetic turf material as indicated on the plans and as specified herein. The installation of all new materials shall be performed in strict accordance with the Manufacturer's written installation instructions, and in accordance with all approved shop drawings.

1.3 Shop Drawings

- A. Shop drawings shall be prepared and contain all pertinent information regarding installation. These drawings shall be submitted to the Owner or Owner's representative for approval prior to the manufacturing and shipment of materials.
- B. Submit drawings for:
 - 1. Installation details, edge detail, goal post detail, other inserts, and covers, etc., as required by contract.
 - 2. Striping plan showing any field lines, markings and boundaries, and field logos per project drawings.

1.4 Quality Assurance

- A. Synthetic Turf Manufacturer is defined as:
 - 1. A company specializing in the design and manufacturing of infilled turf systems with not less than five (5) years documented experience.
 - 2. Manufacturer shall have an experienced technical services and sales professional who is available during the course of the work to meet personally with the Owner, Contractor, and Landscape Architect.
 - 3. Manufacturer will manufacturing locations and be a tax paying entity inside Whitfield County
- B. Synthetic Turf Manufacturer's Experience:
 - 1. The Synthetic Turf Manufacturer shall have the experience of at least one hundred (100) acceptable installations of full-size fields (minimum 65,000 sq. ft.) in the

SECTION 02791 – HEAT REDUCING TOP DRESSING

PART 1 – GENERAL

- United States within the past five (5) years of tufted, polyethylene grass-like fabrics that are filled with a mixture of SBR rubber and sand. **Submit a list of all applicable installations with the bid.**
2. The Synthetic Turf Manufacturer shall have the experience of twenty-five (25) acceptable installations (minimum 65,000 sq. ft.) of fields that are at least eight years old. **Submit a list of all applicable installations with the bid.**
 3. The Synthetic Turf Manufacturer shall have the experience of twenty five (25) acceptable installations of the specific fiber system specified. **Submit a list of all applicable installations with the bid.**
 4. The Synthetic Turf Manufacturer shall have the experience (if applicable to this project specification) of one hundred (100) installations with sewn main fabric seams.
 5. The Synthetic Turf Manufacturer must be a certified member of the Synthetic Turf Council in good standing.
 6. The Synthetic Turf Manufacturer must have and operate its own extensive research and development laboratory. This laboratory must include testing devices for the following tests: Yarn Tensile Strength, Yarn Elongation, Tuft Bind, Grab Tear Strength, Seam Strength, g-max, Force Reduction, Vertical Deformation, Ball Roll, Ball Rebound, Rotational Resistance, Linear Traction, Relative Abrasive Index, UV Resistance, Flammability, and Simulated Aging.
 7. The Synthetic Turf Manufacturer must have manufactured and installed fields at every level of competition, including high school, college and professional.
 8. The Synthetic Turf Manufacturer must have at least (1) one current NCAA Division 1 and (1) one current NFL game stadium field installation. **Submit a list of all applicable installations with the bid.**
 9. The Synthetic Turf Manufacturer must not have had more than (5) five fields replaced, under warranty, during the past 5 years.
 10. The Synthetic Turf Manufacturer must be vertically integrated including in-house tufting, polyethylene monofilament extrusion, in-house coating, polyurethane compounding, manufacture own primary backing, in-house yarn texturizing, ability and flexibility to tuft various gauge widths and have the ability to recycle used/old fields.
 11. The Synthetic Turf Manufacturer must have a fully integrated quality system, directly based on and compliant with ISO 9000, ISO 14001 and OHSAS 18001 international standards.
- C. Synthetic Turf Contractor is defined as:
1. A company that has built and installed a minimum of ten (10) infilled synthetic turf fields. Turf contractors and on-site superintendent shall provide a resume to provide proof of experience
 - a. At any time after award of the contract and before the completion of the project, should any member of the approved crew or subcontractor

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discontinue their relationship with the synthetic turf crew or subcontractor the Owner shall be notified. Failure to provide personnel meeting the minimum qualifications shall be considered default of the contract requirements

- D. Warranty: The Synthetic Turf Contractor shall submit its Manufacturer's Warranty, which guarantees the usability and playability of the synthetic turf system for its intended uses for an eight (8) year period commencing with the date of Substantial Completion.
1. The warranty submitted must have the following characteristics:
 - a) Must provide full-field coverage for eight (8) years from date of Substantial Completion,
 - b) Must warrant materials and workmanship,
 - c) Must warrant that the materials installed meet or the product specifications within manufacturing tolerances,
 - d) Must have a provision to either repair or replace such portion of the installed materials that are no longer serviceable to maintain a serviceable and playable surface,
 - e) Must be a Manufacturer's warranty from a single source covering workmanship and all self-manufactured or procured materials,
 - f) Must not be limited to the amount of annual usage,
 - g) **Must provide, at the time of bid, a copy of its pre-paid 3rd party insurance policy.** This policy must have an annual aggregate amount of no less than \$60 million, and a per incident limit of no less than \$7 million per claim. The third party insurer must have an AM Best rating of A++ or better.

1.5 Existing Conditions

- A. If the surface on which the new synthetic turf is to be installed is an existing asphaltic/concrete base, the Synthetic Turf Contractor will be responsible for any damage due to negligence to the concrete during removal/installation of the synthetic turf system provided there are no failures below the surface which contribute to the damage. The football goal posts, if any, are to be removed and reinstalled by the Owner or Prime Contractor to facilitate the installation of the new synthetic turf system.
- B. If the surface on which the new synthetic turf to be installed is a new asphaltic/concrete base or a new base of compacted, porous aggregate, the Synthetic Turf Contractor will be responsible for any damage to the base during removal/installation of the synthetic turf system after the deficiencies (if any) have been corrected by the base contractor with respect to planarity, compaction, and drainage/permeability. New in ground equipment, football goal post (if any) and /or infield mix backfill within the contiguous synthetic turf limits or immediately adjacent thereto are to be installed prior to the installation of the

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synthetic turf system. Damage to the synthetic turf system during the installation of such materials is not the responsibility of the Synthetic Turf Contractor.

1.6 Schedule

- A. The Synthetic Turf Contractor shall complete all work on the synthetic turf system in accordance with the published project schedule, or as mutually agreed upon.

1.7 Surface Area

- A. The Synthetic Turf Contractor is to verify all measurements.

1.8 Utilities

- A. Owner or Prime Contractor will supply necessary water, adequate lighting, and electricity for installation. Owner or Prime Contractor shall permit use of toilet and wash up facilities.

2.0 PRODUCTS

2.1 Approved Products

- A. All products must meet the minimum specifications of this section and the minimum properties as required by tables I & M regardless of prior approval:
 1. Shaw Sports Turf – Legion
 2. FieldTurf – Vertex Prime
 3. Hellas – Fusion XP²

2.2 Materials

- A. Turf shall be tufted, polyethylene, grass-like fabric coated with a secondary backing of high-grade polyurethane. Refer to grid below. The two fibers on product (1) specified in this grid shall be tufted through the same needle in a grass-like fabric to a finished pile-height also specified in the grid. **Samples must be provided with the bid.**
- B. All components and their installation method shall be designed and manufactured for use on outdoor athletic fields. The materials as hereinafter specified should be able to withstand exposure in all climates, be resistant to insect infestation, rot, fungus, mildew, ultraviolet light and heat degradation, and shall have the basic characteristics of flow-through drainage, allowing free movement of surface runoff through the synthetic turf fabric where such water may flow to the existing base and into the field drainage system.

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- C. The finished playing surface shall appear as mowed grass and shall resist abrasion and cutting from normal use.
- D. The polyethylene pile yarn shall be a proven athletic caliber yarn designed specifically for outdoor use and stabilized to resist the effect of ultraviolet degradation, heat, foot traffic, water, and airborne pollutants.
- E. The system shall be tufted at the pile height and gauge listed in specification grid, refer to table in section 2.2 I.
- F. The Primary Backing must be a multi-layer backing, contain UV stabilizers and must pass 3000 hours of QUV A testing, refer to table in section 2.2 I.
- G. The Secondary Backing of high-grade polyurethane shall be applied to the Primary Backing. Secondary Backing adds resistance to water degradation and strengthens grip on fibers, refer to table in 2.2 I.
- H. The entire backing shall be coated with holes perforated throughout the backing at the Synthetic Turf Manufacturer’s recommended interval to allow for drainage. Partially coated backings or latex coating materials shall not be acceptable.

| I. TURF CHARACTERISTICS | TEST RESULTS | METHOD |
|------------------------------------|-----------------|-------------|
| Linear Density (Denier) Mono/Slit* | 7,200/5,000 | ASTM D 1577 |
| Yarn Thickness Mono/Slit | 300/100 microns | ASTM D 3218 |
| Pile Weight**** | 46 oz./yd2 | ASTM D 5848 |
| Finished Pile Height**** | 2.25 | ASTM D 5823 |
| Product Weight (total)*** | 74 oz./yd2 | ASTM D 5848 |
| Primary Backing Weight**** | 8 oz./yd2 | ASTM D 5848 |
| Secondary Coating Weight+ | 20 oz./yd2 | ASTM D 5848 |
| Fabric Width | 15’ (4.57m) | ASTM D 5793 |
| Tuft Gauge | 1/2” | ASTM D 5793 |
| Grab Tear Strength Avg. | > 200 lb.-F | ASTM D 5034 |
| Tuft Bind (Avg.) | > 10 lb.-F | ASTM D 1335 |
| Infiltrometer (Drainage) | > 25 | ASTM D3885 |

- J. Infill ratios and depths must conform to Manufacturer’s recommendations and must meet the material characteristics and minimum weights of the table in section 2.2 M.
- K. The total infill depth shall not be less than 0.75 inches less than the finished pile height specified, refer to table in section 2.2 I.

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L. The infill system shall consist of a top layer of 100% natural infill consisting primarily of coconut fibers. Approved natural infill products are:

1. Shaw Sports Turf - GeoFill
2. Field Turf - PureGeo Coconut
3. Hellas - GeoPlus

| M. <u>INFILL PROPERTY</u> | <u>STANDARD</u> | <u>SPECIFICATION</u> |
|---------------------------|-----------------|------------------------------------|
| Rubber Granule Comp | N/A | All black SBR |
| Rubber Granule Shape | EN 14955 | Spherical, Moderate, Angular |
| Rubber Sieve Analysis | ASTM D 5644 | 10 / 20MESH (2.0mm – 0.85mm) |
| Sand Granule Shape | ASTM D442 | Semi-rounded to rounded angularity |
| Sand Sieve Analysis | ASTM E11 | 20 / 40 MESH (0.85mm - 0.425 mm) |
| Rubber Weight | N/A | 3.0 pounds per square foot minimum |
| Sand Weight | N/A | 3.0 pounds per square foot minimum |
| Natural Infill Type | N/A | Minimum 85% Coconut Fibers |
| Natural Infill Weight | N/A | 0.5 pounds per square foot minimum |

N. Perimeter edge details, underground storm sewer piping and connections, and goal post foundations required for the system shall be as detailed and recommended by the Design Professional, and as approved by the Owner. The cost for these embedded items shall be included in the Sitework Contractor's price along with the compacted, porous base.

3.0 EXECUTION

3.1 General

- A. The installation shall be performed in full compliance with approved shop drawings.
- B. Only factory-trained technicians skilled in the installation of athletic caliber synthetic turf systems shall undertake the placement of the system.
- C. Subject to the requirements in Section 1.2(B), the surface to receive the synthetic turf shall be verified by the Synthetic Turf Contractor as ready for the installation of the synthetic turf system and must be perfectly clean as installation commences and shall be maintained in that condition throughout the process.

3.2 Removal (if necessary)

- A. Synthetic Turf Contractor shall remove the existing synthetic turf and under-pad from the field (as required by contract).

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- B. After removal of the stadium surface, the existing synthetic turf and pad materials shall be rolled up and placed at a location designated by the Owner.

3.3 *Installation*

- A. The completed base and adjacent curbs/perimeter nailer shall be inspected by the Engineer or Sitework Contractor by means of a laser and plotted on a 10-foot grid. Based upon the Contractor's inspection of the topographical survey, the Sitework Contractor shall fine grade the base suitably, including properly rolling and compacting the base to achieve a surface planarity within 1/4" in 10-feet (+0, -1/4"). OWNER, ENGINEER, OR PRIME CONTRACTOR SHALL NOT APPROVE THE BASE FOR TOLERANCE TO GRADE WITHOUT OBTAINING THE TOPOGRAPHICAL SURVEY.
- B. Subgrade and base shall be uniformly compacted to a minimum of 95% of maximum dry density. Care must be exercised to minimize segregation. Engineer/Sitework Contractor shall make written records available to Synthetic Turf Contractor's inspector for both drainage/permeability and compaction/planarity as obtained from a minimum 10' x 10' grid.
- C. The Synthetic Turf Project Superintendent shall thoroughly inspect all synthetic turf materials delivered to the site for both mixing and quantity to assure that the entire installation shall have sufficient material to maintain proper mixing ratios.
- D. Synthetic turf shall be loose-laid across the field, stretched, and attached to the perimeter edge detail. Synthetic turf shall be of sufficient length to permit full cross-field installation. No head or cross seams will be allowed except as needed for inlaid fabric striping or to accommodate programmed cut-outs.
- E. All seams shall be flat, tight, and permanent with no separation or fraying. Selvedge edges of all panels must be cut and discarded prior to being sewn together. A butt-stitch method of seaming must be implemented and a double-lock stitch with cord recommended by the Synthetic Turf Manufacturer shall be utilized. Bagger stitching is prohibited. Seaming tape is to be constructed of high tenacity, coated non-woven fabric. Inlaid markings shall be adhered to seaming tape with a high strength polyurethane adhesive applied per the Synthetic Turf Manufacturer's standard procedures for outdoor applications. All main fabric seams shall be transverse to the field direction (i.e. run perpendicularly across the field).
- F. Infill materials shall be properly applied in numerous lifts using special broadcasting equipment. The synthetic turf shall be raked and brushed properly as the mixture is applied. The infill materials can only be applied when the synthetic turf fabric is dry.

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3.4 Field Markings and Decorations

- A. Field markings and decorations shall be installed in accordance with approved project shop drawings.

3.5 Clean Up

- A. Synthetic Turf Contractor shall provide the labor, supplies, and equipment, as necessary, for final cleaning of the surfaces.
- B. The Synthetic Turf Contractor shall keep the area clean and clear of debris throughout the project.
- C. Surfaces, recesses, enclosures, etc., shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by Owner.

SECTION 02810 - SODDING 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. Sod:
 - 1. Provide strongly rooted **419 Bermuda Sod**
 - 2. Sod shall be not less than 2 years old and free of weeds and undesirable native grasses.
 - 3. Only provide sod capable of growth and development when planted (viable, not dormant).
 - 4. Provide machine cut sod of a uniform minimum soil thickness of 5/8 inch, plus thickness of top growth and thatch. Sod pieces to be consistent in size and shape.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Sodding 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. Grassing also shall comply with State of Alabama Highway Department specifications, latest Edition.
 - 3. Contractor shall water and maintain newly grassed 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 sodded 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.

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 SODDING

- A. Prepare all areas to receive sod.
- B. **The Contractor shall fully sod all graded and disturbed areas, including the Contractors staging area and all areas disturbed by vehicular construction traffic, whether shown on plans or not.**

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.

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 - STEEL ORNAMENTAL FENCE SYSTEMS & GATES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Ornamental Steel Fence System and Gates.
- B. Exit Gate Hardware.

1.2 RELATED WORK

- A. Section 03310, Concrete

1.3 SYSTEM DESCRIPTION

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

1.4 QUALITY ASSURANCE

- A. The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and the materials specified.

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 SUBMITTAL

- A. The manufacturer's submittal package shall be submitted prior to installation to confirm compliance with all requirements for materials specified in this section.

1.7 PRODUCT HANDLING AND STORAGE

- A. Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage and to protect against damage, weather, vandalism and theft.

1.8 PRODUCT WARRANTY

- A. All structural fence components (i.e. rails, pickets, and posts) shall be warranted within specified limitations, by the manufacturer for a period of 10 years from date of original purchase. Warranty shall cover any defects in material finish, including cracking, peeling, chipping, blistering or corroding.
- B. Reimbursement for labor necessary to restore or replace components that have been found to be

defective under the terms of manufactures warranty shall be guaranteed for five (5) years from date of original purchase.

PART 2 - MATERIALS

2.1 MANUFACTURER

- A. Ameristar Perimeter Security USA Inc.; 1555 N. Mingo Road, Tulsa, OK 74116; www.ameristarfence.com; PH: 888.333.3422
- B. Exit Bar Kits (*At Required Locations*):
 - 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 MATERIAL

- A. "Aegis II" Industrial Ornamental Steel Fencing and Gates by Ameristar Perimeter Security USA Inc.
 - 1. Style: "Genesis" 3-rail style with Triad Finials and between rail Rings.
- B. Steel material for fence framework (i.e. tubular pickets, rails and posts), shall be galvanized prior to forming in accordance with the requirements of ASTM A653/A653M, with minimum yield strength of 45,000 psi (310 MPa). The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90 oz/ft² (276 g/m²), Coating Designation G-90.
- C. Material for pickets shall be 1" square x 14 Ga. tubing. The cross-sectional shape of the rails shall conform to the manufacturer's ForeRunner™ double wall design with outside cross-section dimensions of 1.75" square and a minimum thickness of 14 Ga. Picket holes in the ForeRunner rail shall be spaced 4.715" o.c., except for Invincible style 6' long, which shall be, spaced 4.98" o.c. Picket retaining rods shall be 0.125" diameter galvanized steel. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections. Fence posts and gateposts shall meet the minimum size requirements of Table 1.
- D. Swing Gate Exit Bar Kit (*At Required Locations*) (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 FABRICATION

- A. Pickets, rails and posts shall be precut to specified lengths. ForeRunner rails shall be prepunched to accept pickets. Pickets shall be predrilled to accept retaining rods.
- B. Grommets shall be inserted into the prepunched holes in the rails and pickets shall be inserted through the grommets so that predrilled picket holes align with the internal upper raceway of the ForeRunner rails (Note: This can best be accomplished by making an alignment jig). Retaining rods shall be inserted into each ForeRunner rail so that they pass through the predrilled holes in each picket.
- C. The manufactured galvanized framework shall be subjected to the PermaCoat® thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pretreatment/wash, an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish. The base coat shall be a thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm). The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be (specify Black, Bronze, White, or Desert

Sand). The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2.

- D. Completed sections (i.e., panels) shall be capable of supporting a 600 lb. load applied at midspan without permanent deformation. Panels shall be biasable to a 25% change in grade.
- E. Swing gates shall be fabricated using 1.75" x 14ga Forerunner double channel rail, 2" sq. x 12ga. gate ends, and 1" sq. x 14ga. pickets. Gates that exceed 6' in width will have a 1.75" sq. x 14ga. intermediate upright. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding. Gusset plates will be welded at each upright to rail intersection. Cable kits will be provided for additional trussing for all gates leaves over 6'.
- F. Pedestrian swing gates shall be self-closing, having a gate leaf no larger than 48" width. Integrated hinge-closer set (2 qty) shall be ADA compliant that shall include a variable speed and final snap adjustment with compact design (no greater than 5" x 6" footprint). Hinge-closer set (2 qty) shall be tested to a minimum of 500,000 cycles and capable of self-closing gates up to a maximum gate weight of 260 lbs. and maximum weight load capacity of 1,500 lbs. Hinge-closer device shall be externally mounted with tamper-resistant security fasteners, with full range of adjustability, horizontal (.5" - 1.375") and vertical (0 - .5"). Maintenance free hinge-closer set shall be tested to operate in temperatures of negative 20 F to 200 F degrees, and swings to negative 2 degrees to ensure reliable final lock engagement.

PART 3 - EXECUTION

3.1 PREPARATION

- A. All new installation shall be laid out by the contractor in accordance with the construction plans.

3.2 FENCE INSTALLATION

- A. Fence post shall be spaced according to Table 3, plus or minus 1/2". For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to posts with brackets supplied by the manufacturer. Posts shall be set in concrete footers having a minimum depth of 36" (Note: In some cases, local restrictions of freezing weather conditions may require a greater depth). The "Earthwork" and "Concrete" sections of this specification shall govern material requirements for the concrete footer. Posts setting by other methods such as plated posts or grouted core-drilled footers are permissible only if shown by engineering analysis to be sufficient in strength for the intended application.

3.3 FENCE INSTALLATION MAINTENANCE

- A. When cutting/drilling rails or posts adhere to the following steps to seal the exposed steel surfaces:
 1. Remove all metal shavings from cut area.
 2. Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry.
 3. Apply 2 coats of custom finish paint matching fence color. Failure to seal exposed surfaces per steps 1-3 above will negate warranty. Ameristar spray cans or paint pens shall be used to prime and finish exposed surfaces; it is recommended that paint pens be used to prevent overspray. Use of non-Ameristar parts or components will negate the manufactures' warranty.

3.4 GATE INSTALLATION

- A. Gate posts shall be spaced according to the manufacturers' gate drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected. Type and quantity of gate hinges shall be based on the application; weight, height, and number of gate cycles. The manufacturers' gate drawings shall identify the necessary gate hardware required for the application. Gate hardware shall be provided by the manufacture of the gate and shall be installed per manufacturer's recommendations.

3.5 CLEANING

- A. The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered

uniformly away from posts.

3.6 TABLES

| Table 1 – Minimum Sizes for Aegis II Posts | | | | |
|---|--------------------------------------|---|--|-----------------|
| <u>Fence Posts</u> | <u>Panel Height</u> | | | |
| 2-1/2" x 12 Ga. | Up to & Including 6' Height | | | |
| 3" x 12 Ga. | Over 6' Up to & Including 10' Height | | | |
| 4" x 11 Ga. | Over 10' Height | | | |
| | <u>Gate Height</u> | | | |
| <u>Gate Leaf</u> | <u>Up to & Including 6'</u> | <u>Over 6' Up to & Including 8'</u> | <u>Over 8' Up to & Including 10'</u> | <u>Over 12'</u> |
| Up to 4' | 3" x 12Ga. | 3" x 12 Ga. | 4" x 11 Ga. | 4" x 11 Ga. |
| 4'1" to 6' | 3" x 12Ga. | 3" x 12 Ga. | 4" x 11 Ga. | 4" x 11 Ga. |
| 6'1" to 8' | 4" x 11 Ga. | 6" x 3/16" | 6" x 3/16" | 6" x 3/16" |
| 8'1" to 10' | 4" x 11 Ga. | 6" x 3/16" | 6" x 3/16" | 6" x 3/16" |
| 10'1" to 12' | 6" x 3/16" | 6" x 3/16" | 6" x 3/16" | 8" x 1/4" |
| 12'1" to 16' | 6" x 3/16" | 6" x 3/16" | 8" x 1/4" | 8" x 1/4" |

| Table 2 – Coating Performance Requirements | | |
|---|-------------------------------|---|
| <u>Quality Characteristics</u> | <u>ASTM Test Method</u> | <u>Performance Requirements</u> |
| Adhesion | D3359 – Method B | Adhesion (Retention of Coating) over 90% of test area (Tape and knife test). |
| Corrosion Resistance | B117, D714 & D1654 | Corrosion Resistance over 3,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters). |
| Impact Resistance | D2794 | Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball). |
| Weathering Resistance | D822 D2244, D523 (60° Method) | Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units). |

Table 3 – Aegis II – Post Spacing By Bracket Type

| | | | | | | | | |
|--|---|-------|---|------------------------------------|-------------------------------------|---------|----------------------------------|--------|
| Span | For INVINCIBLE® 8' Nominal (91.25" Rail) | | For CLASSIC, GENESIS, & MAJESTIC 8' Nominal (92.625" Rail) | | | | | |
| Post Size | 2-1/2" | 3" | 2-1/2" | 3" | 2-1/2" | 3" | 2-1/2" | 3" |
| Bracket Type | Industrial Flat Mount (BB301) | | Industrial Universal (BB302) | Industrial Universal (BB303) | Industrial Flat Mount (BB301) | | Industrial Swivel (BB304)* | |
| Post Settings ± 1/2" O.C. | 94-1/2" | 95" | 96" | 96.5" | 96" | 96-1/2" | *97-1/2" | *98" |
| Span | For INVINCIBLE® 6' Nominal (67.75" Rail) | | For CLASSIC, GENESIS, & MAJESTIC 6' Nominal (71.375" Rail) | | | | | |
| Post Size | 2-1/2" | 3" | 2-1/2" | 3" | 2-1/2" | 3" | 2-1/2" | 3" |
| Bracket Type | Industrial Flat Mount (BB301) | | Industrial Universal (BB302) | Industrial Universal (BB303) | Industrial Flat Mount (BB301) | | Industrial Swivel (BB304)* | |
| Post Settings ± 1/2" O.C. | 75" | 75.5" | 71.5" | 72" | 71.5" | 72" | *73" | *73.5" |
| <p>*Note: When using BB304 swivel brackets on either or both ends of a panel installation, care must be taken to ensure the spacing between post and adjoining pickets meets applicable codes. This will require trimming one or both ends of the panel.</p> | | | | | | | | |

END OF SECTION

SECTION 02830 - TEMPORARY CHAIN LINK FENCING & GATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: Erection and maintenance of temporary chain link fencing and gates.
- B. Refer to Section 01010, contractor to provide temporary fence layout and location of fence and gates.

1.2 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.

1.3 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings:
 - a. Product Data: Include construction details, material descriptions, dimensions of individual components, and finishes for chain link fences and gates.
 - i. Fence, gate posts, rails, and fittings.
 - ii. Chain link fabric.
 - iii. Gates and hardware.
 - 2. Test Reports: Field test result for compliance of installation of chain link fence and gates.
- B. Informational Submittals:
 - 1. Manufacturer's recommended installation instructions.
 - 2. Evidence of Supplier and installer qualifications.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Site in undamaged condition. Store materials off the ground to provide protection against oxidation caused by ground contact.

1.5 SCHEDULING AND SEQUENCING

- A. Install temporary fence and gates prior to beginning demolition work and/or new construction work
- B. Complete necessary Site preparation and grading before installing chain link fence and gates.

PART 2 - PRODUCTS

2.1 MANUFACTURERE - Galvanized Steel Fencing: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

- A. Master Halco
- B. Merchants Metal
- C. Stephens Pipe and Steel, LLC.
- D. Eagle Fences
- 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.

2.2 TEMPORARY CHAIN LINK FENCING

- A. Unless otherwise indicated, type of temporary chain link fencing shall be as follows:
 - 1. New materials or previously used salvaged chain link fencing in good condition.

2. Height: 8'-0" (minimum) unless otherwise indicated on drawings.
 3. Posts: 2" min. galvanized steel pipe of diameter to provide rigidity. Post shall be suitable for setting in concrete footings.
 4. Fencing Fabric: 2" diamond woven galvanized steel wire mesh. Provide in continuous lengths to be wire tied to fence posts or prefabricated into modular pipe-framed fence panels.
 5. Privacy Fabric: Temporary fencing shall be outfitted with privacy fabric.
 - a. Color: Green
 - b. Material Requirement: Polyethylene, 4.9 oz/sq. yd., Burst Strength: 210 psi
- B. Gates: Provide personnel and vehicle gates of the quantity and size indicated on the Drawings or required for functional access to site.
1. Fabricate of same material as used for fencing.
 2. Vehicle gates:
 - a. Minimum width: 20 feet to allow access for emergency vehicles.
 - b. Capable of manual operation by one person.

PART 3 - EXECUTION

3.1 GENERAL- TEMPORARY CHAIN LINK FENCING

- A. Installation of temporary fencing shall not deter or hinder access to existing and new hose connections and fire hydrants.
 1. Maintain 3 feet diameter clear space around fire hydrants.
 2. Where fire hydrant or hose connection is blocked by fencing, provide access gate.
- B. Access: Provide gates for personnel, delivery of materials, and access by emergency vehicles.
- C. Field verify gate locations with Architect.

3.2 INSTALLATION - FENCE

- A. Chain link posts:
 1. Post spacing shall be 12' maximum if using prefabricated panels and 10' maximum if wire tying mesh to posts.
 2. End, Corner and Line posts shall be **set in concrete OR post driven.**
 3. Gate posts: Use concrete footings and brace to provide rigidity for accommodating size of gate. **Gate posts MUST be set in concrete.**
- B. Fabric: Leave approximately 2" between finish grade and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts. Install fabric on security side of fence, and anchor to framework so that fabric remains in tension after pulling force is released.
- C. Gates: Install with required hardware.
- D. Wire Ties: 11 gage galvanized steel.
- E. Tension Wire: 7 gage, galvanized coated coil spring wire, metal and finish to match fabric.
- F. Concrete: Provide concrete consisting of portland cement, ASTM C 150, aggregates ASTM C 33, and clean water. Mix materials to obtain concrete with a minimum 28 day compressive strength of 3,000 psi using at least 4 sacks of cement per cu. yd., 1" maximum size aggregate, maximum 3" slump.

3.3 INSTALLATION - GATES

- A. Chain link gates:

1. Fabricate perimeter frames of gates from metal and finish to match fence framework. Assemble gate frames by welding or with special fittings and rivets for rigid connections, providing security against removal or breakage connections. Provide horizontal and vertical members to ensure proper gate operation and attachment of fabric, hardware and accessories. Space frame members maximum of 8' apart unless otherwise indicated.
 2. Provide same fabric as for fence, unless otherwise indicated. Install fabric with stretcher bars at vertical edges and at top and bottom edges. Attach stretcher bars to gate frame at not more than 15" o.c.
 3. Install diagonal cross-bracing consisting of 3/8" diameter adjustable length truss rods on gates to ensure frame rigidity without sag or twist.
- B. Gate Hardware: Provide hardware and accessories for each gate, galvanized per ASMT A 153, and in accordance with the following.
1. Hinges: Size and material to suit gate size, non-lift off type, offset to permit 180 degree gate opening. Provide 1½ pair hinges for each leaf over 6' nominal height.
 2. Latch: Forked type or plunger-bar type to permit operation from either side of gate, with padlock eye as integral part of latch.
 3. Keeper: Provide keeper for vehicle gates, which automatically engages gate leaf and holds it in open position until manually released.
 4. Double Gates: Provide gate stops for double gates, consisting of mushroom type flush plate with anchors, set in concrete, and designed to engage center drop rod or plunger bar. Include locking device and padlock eyes as integral part of latch, permitting both gate leaves to be locked with single padlock.

3.4 MAINTENANCE

- A. Maintain fencing in good condition. If damaged, Contractor shall immediately repair at no additional cost to owner.

3.5 FIELD QUALITY CONTROL

- A. Post and Fabric Testing: Test fabric tension and line post rigidity according to ASTM F1916.
- B. Gate Tests:
1. Prior to acceptance of installed gates, demonstrate proper operation of gates under each possible open and close condition specified.
 2. Adjust gate to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range.
 3. Confirm that latches and locks engage accurately and securely without forcing and binding.

3.6 CLEANUP

- A. Remove excess fencing materials, soil, concrete and any other debris from Site which resulted from installation of fences and/or gates.

END OF SECTION

SECTION 02831 - VINYL COATED CHAIN LINK FENCES AND GATES

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 chain link fences and gates is indicated on drawings.

1.3 SECTION INCLUDES

- A. Fence framework, fabric, and accessories.
- B. Excavation for post bases; concrete foundation for posts gate assemblies.
- C. Manual swing gates and related hardware.

1.4 REFERENCES

- A. ANSI/ASTM A123 - Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
- B. ASTM A116 - Zinc-Coated (Galvanized) Steel Woven Wire Fence Fabric.
- C. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- D. ASTM A569 - Steel, Carbon (0.15 Maximum Percent), Hot-Rolled Sheet and Strip Commercial Quality.
- E. ASTM C94 - Ready-mixed Concrete.

1.5 SYTEM DESCRIPTION

- A. **Fence Height:** As indicated on drawings, otherwise 4 feet.
- B. **Fence Length:** As indicated on drawings.
- C. **Location:** As indicated on drawings.
- D. Intervals not exceeding 10 feet on center in straight runs and 8 feet on center curves.

1.6 SUBMITTALS

- A. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.
- B. Qualifications:
- C. Manufacturer: Company specializing in manufacturing the products specified in this Section to have minimum three years documented experience.

1.7 FIELD MEASUREMENTS

- A. Verify that field measurements are as shown on Drawings prior to installation.

PART 2 - PRODUCTS

2.1 MANUFACTURER: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:

- A. Fence System:
 - 1. Master-Halco, Inc
 - 2. Merchants Metals
 - 3. Stephens Pipe and Steel, LLC.
 - 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. Fence Framework:
 1. Allied Tube: Product SS 40.
 2. Century Tube: Product CMT 40.
- C. Chain Link Fabric:
 1. Merchants Metals.
 2. Cargill.
- D. Padlocks:
 1. Yale.
 2. Master.
 3. Sargent.

2.2 MATERIALS & COMPONENTS

- A. Framing Materials: Round SS 40, steel pipe, vinyl coated per ASTM F1234 outside. Post to have tops to exclude moisture.
- B. Fabric: 9 gage fused bonded fabric shall have PVC coating of 7 to 12 mils per ASTM F668 Class 2B.
- C. Swing Gates: Size as shown on Drawings covered with chain link fabric. Gates shall be complete with industrial type, fixed pin, 180 degree hinges and drop latches with padlock left in proper operating condition.
- D. Padlocks: Industrial grade and shall be keyed alike, and as Owner's existing locks, when more than one is required.
- E. Components:
 1. Line Posts: 2.0 inch outside diameter.
 2. Corner and Terminal Posts: 3.0 inch outside diameter.
 3. Swing Gate Posts: 3.0 inch minimum outside diameter for less than 6 foot gate leaf. 4.0 inch minimum outside diameter for 6 foot gate leaf or greater or outside diameter as required by design. Posts shall be of sufficient diameter and weight to prevent deflection or gate sagging.
 4. Top and Bottom Rail: 1-5/8 inch diameter, plain end, sleeve coupled with 0.111 inch wall thickness. Provide Mid-Rails at fences and gates in excess of 5 feet in height.
 5. Swing Gate Frame: 1-5/8 inch minimum diameter welded or fitting type fabrication. Welded fabrication shall be vinyl coated after weld connections are made. The frame components shall be of sufficient diameter, weight and design to avoid sagging and allow easy operation.
 6. Fabric: 2 inch vinyl coated diamond mesh interwoven wire, 9 gage thick, top selvage twisted tight, bottom selvage knuckle end closed.
 7. Tension Wire: 7 gage thick steel, single strand, vinyl coated.
 8. Tie Wire: Aluminum alloy steel wire, vinyl coated.
- F. Accessories:
 1. Caps: Cast steel vinyl coated; sized to post diameter, set screw retainer.
 2. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; steel, vinyl coated.
 3. Swing Gate Hardware: Fork latch with gravity drop, center gate stop and drop rod; three 180 degree gate hinges per leaf and hardware for padlock.
- G. Finishes:
 1. Components: Vinyl coated to ASTM F123, 10-14 mil coating.

2. Hardware: Vinyl coated.
3. Accessories: Same finish as fabric.
4. Color: Shall be selected by Architect and Owner.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install framework, fabric, accessories and gates in accordance with ANSI/ASTM F567 and manufacturer's instructions.
- B. Set all posts plumb, in concrete footings with top of footing 1 inch above finish grade. Slope top of concrete for water runoff.
- C. Line Post Footing Depth Below Finish Grade: Minimum three feet (18 inches in solid rock) and not less than 12 inches in diameter.
- D. Corner, Gate and Terminal Post Footing Depth Below Finish Grade: Minimum three feet (18 inches in solid rock) and not less than 12 inches in diameter.
- E. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail, one bay from end and gate posts.
- F. Provide top rail through line post tops and splice with 6 inch long rail sleeves.
- G. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.
- H. Position bottom of fabric 2 inches above finished grade.
- I. Fasten fabric to top, bottom and mid- rails, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.
- J. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips. Install bottom tension wire stretched taut between terminal posts.
- K. Do not swing gate from building wall; provide gate posts.
- L. Install gates with fabric to match fence. Install three hinges per leaf, latch, catches, drop bolt, foot bolts and sockets, torsion spring, retainer and locking clamp.
- M. Provide concrete center drop to footing depth and drop rod retainers at center of double gate openings.
- N. Clean all excess grout, concrete, grease, paint, etc., from fence.
- O. Erection Tolerances:
 1. Maximum Variation From Plumb: 1/4 inch.
 2. Maximum Offset From True Position: 1 inch.
 3. Components shall not infringe adjacent property lines.

3.2 SCHEDULE

- A. Fence and gate location(s) as indicated on Drawings.
- B. Fence and gate size(s) as indicated in this section, otherwise as indicated on drawings.

END OF SECTION

SECTION 02846 - SITE GRAPHICS

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 SECTION INCLUDES

- A. Provide traffic control signs complying with U. S. Department of Transportation, Federal Highway Administration's "Manual on Uniform Traffic Control Devices" and as required by other local ordinances or regulations or other governing authorities and as specified herein. See Drawings for type and quantity of signs required.
- B. Work shall comply with the latest edition of city ordinance and/or regulations and requirements of any governing authority on site graphics.

1.3 SUBMITTALS

- A. Submit manufacturer's mounting instructions to Owner, Architect and Engineer.

PART 2 - PRODUCTS

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

- A. SA-SO, Inc.; www.sa-so.com; 525 N. Great Southwest Pkwy., Arlington, Texas 76011; Phone: 972.641.4911.
- 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. SIGNS

- 1. "Handicapped Parking" with Symbol Sign
 - a. 12"x18"
 - b. Blue legend on White reflective background
 - c. ASTM Type II Super Engineer Grade (SEG) sheeting on reflective sign
- 2. "Van Accessible" Supplemental Sign
 - a. 12"x6"
 - b. Blue legend on White reflective background
 - c. ASTM Type II Super Engineer Grade (SEG) sheeting on reflective sign

B. POSTS

- 1. "U" Channel Sign Posts
 - a. Standard Weight: 2 lbs. per foot
 - b. Galvanized
 - c. Pre-drilled and punched on 1" centers entire length for easy sign mounting.
 - d. Meet ASTM A499

2.3 MOUNTING HARDWARE

- A. Provide stainless steel nuts, bolts, and washers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Placement of all site signage shall be as directed by the Architect during construction.
- B. Mount signs in accordance with manufacturer's instructions.

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, Euclid 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

- 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 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. MANUFACTURERES: 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 uncored or unfroged 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 valve of **\$600.00 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 valve of **\$600.00 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.
- C. ALLOWANCES:
 - 1. *Face and Accent Brick* to have a valve of **\$26.00 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 **\$26.00 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.
- 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 Running Bond.**
- 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-WYTHE 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 04412 - GRANITE COUNTERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Stone countertops.
 - 2. Stone side and backsplashes.

1.2 REFERENCES

- A. ASTM C 119-04: Terminology Relating to Dimension Stone
- B. ASTM C 170-90 (1999): Test Method for Compressive Strength of Dimension Stone
- C. ASTM C 615-03: Specification for Granite Dimension Stone
- D. ASTM C 880-98: Test Method for Flexural Strength of Dimensional Stone

1.3 SUBMITTALS

- A. Product Data: For each Granite Countertop, stone accessory, and other manufactured products.
 - 1. Each stone type: Physical properties
- B. Shop Drawings: Include plans, sections, details, and attachments to other work. Show fabrication and installation details for dimension stone cladding:
 - 1. Include dimensions and profiles of stone units.
 - 2. Show locations and details of joints.
 - 3. Show locations and details of anchors and supports.
- C. Stone Samples: (2) Sets for each stone required, exhibiting the full range of color characteristics expected; not less than 12 inches square.
 - 1. Grout Samples: Full range of exposed color and texture.
 - 2. Sealant Samples: For each type and color of joint sealant required.
- D. Sealant Compatibility Test Report: Submit test report from sealant manufacturer, in accordance with Division 07 Section "Joint Sealants" stating that sealants will not stain stone.
- E. Maintenance Data: Provide maintenance manuals for stone countertops. Include stone-care products recommended by stone source.

1.4 QUALITY ASSURANCE

- A. Granite Standard: Granite shall comply with ASTM C 615, "Standard Specification for Granite Dimension Stone" for material characteristics, physical requirements, and sampling for selection of granite.

General: All granite shall be of standard architectural grade, free of cracks, seams, or starts, which may impair its structural integrity or function. Color or other visual characteristics indigenous to the particular material and adequately demonstrated in the sampling or mock-up phases will be accepted provided they do not compromise the structural or durability capabilities of the material. Texture and finish shall be within the range of samples approved by the Architect.

- B. Fabricator Qualifications: Company with experience in the fabrication and installation of work similar to that required for this project for a period of 3 years or more and meets the following requirements:
 - 1. Experience with wet fabrication techniques and has a shop capable of cutting and polishing granite in compliance with MIA Standards.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions of construction to receive stone countertops by field

New Softball Complex at
Daphne High School for the
Baldwin County Board of Education
Daphne, Alabama

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measurements before fabrication.

PART 2 - PRODUCTS

2.1 STONE SOURCE

- A. Obtain each variety of stone from a single quarry.
 - 1. Obtain each variety of stone from a single quarry, whether specified in this Section or in another Section of the Specifications.
 - 2. Make stone slabs available for Architect to examine for appearance characteristics.
 - a. Architect will select aesthetically acceptable slabs and will indicate aesthetically unacceptable portions of slabs.

2.2 STONE MATERIAL

- A. Granite: ASTM C 615.
- B. Cut stone from one block or contiguous, matched blocks in which natural markings occur.
- C. Match Architect's samples.
- D. Granite: Color to be selected from Industry Standards
 - 1. Location: As noted on drawings as follows:
 - a. Counters
 - b. Backsplash
 - c. Sidesplash
 - 2. Finish:
 - a. Polished Surfaces and Exposed Edges: A highly reflective, smooth finish that magnifies the stone's natural appearance by illuminating the vibrant colors.
 - 3. Thickness: Not less than the following:
 - a. 1-1/4 inches [32 mm]
 - 4. Edge:
 - a. Straight with eased edge: 1/8" (0.30 cm), top and bottom

2.3 STONE ACCESSORIES

- A. General: Use only adhesives formulated for stone and recommended by manufacturer for the application shown on Drawings.
- B. Water-Cleanable Epoxy Adhesive: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Water-Cleanable Epoxy Grout: ANSI A118.3, chemical-resistant, water-cleanable, tile- setting and -grouting epoxy, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Stone Adhesive: 2-part epoxy or polyester adhesive, formulated specifically for bonding stone to stone, with an initial set time of not more than 2 hours at 70 deg F, and with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 1. Color: Match stone.
- E. Sealant for Countertops: Manufacturer's standard sealant of characteristics indicated below that comply with applicable requirements in Division 07 Section "Joint Sealants" and will not stain the stone it is applied to.
 - 1. Single-component, neutral-curing silicone sealant.
 - 2. Color: As selected by Architect.

3. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- F. Stone Cleaner: Cleaner specifically formulated for stone types, finishes, and applications indicated, as recommended by stone producer. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.
- G. Stone Sealer: Colorless, stain-resistant sealer that does not affect color or physical properties of stone surfaces, as recommended by stone producer for application indicated.

2.4 STONE FABRICATION, GENERAL

- A. General: Fabricate stone per requirements, including Drawings and Shop Drawings.
 1. Granite: NBGQA's "Specifications for Architectural Granite."
- A. Select stone for intended use to prevent fabricated units from containing cracks, seams, and starts that could impair structural integrity or function.
- B. Grade and mark stone for final locations to produce assembled countertop units with an overall uniform appearance.
- C. Fabricate stone countertops in sizes and shapes required to comply with requirements indicated, including details on Drawings and Shop Drawings.
 1. Clean sawed backs of stones to remove rust stains and iron particles.
 2. Dress joints straight and at right angle to face, unless otherwise indicated.
 3. Cut and drill sinkages and holes in stone for anchors, supports, and attachments.
 4. Provide openings, reveals, and similar features as needed to accommodate adjacent work.
 5. Fabricate molded edges with machines having abrasive shaping wheels made to reverse contour of edge profile to produce uniform shape throughout entire length of edge and with precisely formed arris slightly eased to prevent snipping, and matched at joints between units. Form corners of molded edges as indicated with outside corners slightly eased, unless otherwise indicated.
 6. Finish exposed faces of stone to comply with requirements indicated for finish of each type of stone required and to match approved Samples and mockups. Provide matching finish on exposed edges of countertops, splashes, and cutouts.
- D. Carefully inspect finished stone units at fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units.
- E. Cutouts and Holes:
 1. Undercounter Fixtures: Make cutouts for undercounter fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.
 2. Counter-Mounted Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations.
 3. Fittings: Drill countertops in shop for plumbing fittings, counter mounted soap dispensers, and similar items.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates indicated to receive stone countertops and conditions under which stone countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials before

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setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives. Allow stone to dry before installing.

3.3 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/16 inch in 48 inches.
- B. Variation from Level: Do not exceed 1/8 inch in 96 inches, 1/4 inch maximum.
- C. Variation in Joint Width: Do not vary joint thickness more than 1/4 of nominal joint width.
- D. Variation in Plane at Joints (Lipping): Do not exceed 1/64-inch difference between planes of adjacent units.
- E. Variation in Line of Edge at Joints (Lipping): Do not exceed 1/64-inch difference between edges of adjacent units, where edge line continues across joint.

3.4 INSTALLATION OF COUNTERTOPS

- A. Install countertops over plywood subtops with full spread of water-cleanable epoxy adhesive.
- B. Do not cut stone in field. If stone countertops or splashes require additional fabrication not specified to be performed at Project site, return to fabrication shop for adjustment.
- C. Set stone to comply with requirements shown on Drawings and Shop Drawings. Shim and adjust stone to location shown. Install countertops with uniform joints of widths shown and with edges and faces aligned.
- D. Bond joints with stone adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
- E. Joints to be evenly filled with sealant. Use temporary shims to ensure uniform spacing.
- F. Install backsplash and end splash by adhering to wall with water-cleanable epoxy adhesive. Gap between countertop and splash to be filled with sealant. Use temporary shims to ensure uniform spacing.
- G. Grout joints to comply with ANSI A108.10. Remove temporary shims before grouting. Tool grout uniformly and smoothly with plastic tool.
- H. Apply sealant to joints; comply with Division 07 Section "Joint Sealants." Remove temporary shims before applying sealant.

3.5 ADJUSTING AND CLEANING

- A. In-Progress Cleaning: Clean countertops as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.
- B. Remove and replace stone countertops of the following description:
 - 1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Architect.
 - 2. Defective countertops.
 - 3. Defective joints, including misaligned joints.
 - 4. Interior stone countertops and joints not matching approved Samples and mockups.
 - 5. Interior stone countertops not complying with other requirements indicated.
- C. Replace in a manner that results in stone countertops matching approved Samples and mockups, complying with other requirements, and showing no evidence of replacement.
- D. Following installation and after sealants are cured, clean stone countertops using clean water and soft rags.

3.6 PROTECTION

- A. Repair scratches and scars according to manufacturer's instructions.

- B. Provide protection according to countertop manufacturer's instructions, but not less than the following:
1. Sealer Application: Apply stone sealer to comply with stone producer's and sealer manufacturer's instructions.
 2. Protective Covering: Cover granite surfaces with nonstaining kraft paper, clean fabric tarp, or 6 mil plastic film. Remove protective covering at Completion of project.

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.

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 after bid date.
- F. Units: As indicated on the drawings.
- G. Profiles: As indicated on the drawings.
- H. 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. Type 304 stainless 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

Notes: RockCast products, like all concrete masonry products, may shrink slightly with the loss of moisture, therefore the use of elastic (control) joints is highly recommended. Refer to NCMA TEK Bulletins 10-1A "Design of Concrete Masonry for Crack Control", 10-2C "Control Joints for Concrete Masonry Walls - Empirical Method", 10-4 "Crack Control for Concrete Brick and Other Concrete Masonry Veneers", and 5-2A "Clay and Concrete Masonry Banding Details" for guidelines.

Refer to NCMA TEK Bulletin 3-6B "Concrete Masonry Veneers" for proper veneer anchoring.

You can view NCMA e-TEK bulletins at www.readingrock.com

- 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 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, fy250ks.
- 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

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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 A_ 153 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 A_ 386 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 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.
- B. Work Included: All wood, nails, bolts, screws, framing anchors and other rough hardware, and all other items needed for rough and finished carpentry in this work but not specifically described in other sections of these specifications.
- C. Quality Assurance: In addition to complying with all pertinent codes and regulations, all materials of this section shall comply with pertinent provisions of:
 - 1. Southern Pine Southern Pine Inspection Bureau Plywood ‘Softwood Plywood - Construction and Industrial’ (Amended June 1969), Product Standard PD 1-66 of U.S. Department of Commerce, Bureau of Standards, and A.P.A.
 - 2. Rough Hardware “Specification for the Design, Fabrication and Erection of Structural Steel for Buildings of the American Institute of Steel Construction”
 - 3. Building Paper Federal Specification UU-B-790a, dated February 5, 1968
 - 4. Wood Preservative Standard P-5 of the American Wood Preservers Institute
 - 5. Other Similar and pertinent reference standards for the products needed.
- D. Conflicting Requirements: In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards or these specifications, the provisions of the more stringent shall govern.
- E. Qualifications of Workmen: Provide sufficient skilled workmen and supervisors who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.
- F. Rejection: In the acceptance or rejection of rough carpentry, no allowance will be made for lack of skill on the part of workmen.

1.2 PRODUCT HANDLING

- A. Protection: Store all materials in such a manner as to ensure proper ventilation and drainage and to protect against damage and the weather.
 - 1. Use all means necessary to protect lumber materials before, during and after delivery to the job site, and to protect the installed work and materials of all other trades.
 - 2. Deliver the materials to the job site and store all in a safe area, out of the way of traffic, and shored up off the ground surface.
 - 3. Protect all metal products with adequate weather-proof outer wrappings.
 - 4. Use extreme care in the off-loading of lumber to prevent damage, splitting and breaking of materials.
 - 5. Keep all material clearly identified with all grade marks legible; keep all damaged material clearly identified as damaged, and separately stored to prevent its inadvertent use.
 - 6. Do not allow installation of damaged or otherwise non-complying material.
 - 7. Use all means necessary to protect the installed work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 – MATERIALS

2.1 MATERIALS - GENERAL

- A. Grade Stamps:
- B. Framing Lumber: Identify all framing lumber by proper grade stamp.
- C. Plywood: Identify all plywood as to species, grade and glue type by the stamp of the American Plywood Association.
- D. Other: Identify all other materials of this section by the appropriate stamp of the agency listed in the reference standards, or by such other means as are approved in advance by the Architect.
- E. Moisture Content: Moisture content of any material for framing not to exceed 19% for boards 8" in width or less. Boards exceeding 8" in width not to exceed 15% at time of installation. All material used for finish and trim work to be kiln dried material with moisture content not to exceed that allowed by FHA for intended use.

2.2 MATERIALS - WOOD

- A. All materials of this Section, unless specifically otherwise approved in advance by the Architect, shall meet or exceed the following:
 - 1. Plates, Grounds or furring
 - a. Pressure treated #2 KD Southern Yellow Pine in contact w/concrete, masonry or plaster
 - 2. Plywood Roof Decking
 - a. 5/8" – 4' x 8' CDX Grade with exterior glue, install with plyclips.
 - 3. Plywood Sheathing:
 - a. 1/2" APA plywood sheathing. NOTE: See structural Drawings
 - b. Vapor Barrier:
 - i. The General Contractor shall furnish and install a TAMKO® TW Moisture Wrap, flexible, 40-mil, self-adhering, over all exterior wall sheathing
 - or**
 - ii. The General Contractor shall seal all joints of the exterior wall sheathing as follows:
 - a) Furnish and install spray application of a 10 mil cold fluid applied elastomeric waterproofing. Equal to Senergy Senershield R.
 - AND**
 - b) Furnish and install commercial building wrap over the entire exterior wall sheathing. Equal to DuPont "Commercial" wrap.
 - 4. All Framing Members
 - a. Lodge Pole Spruce #2 KD
 - 5. Wood Preservative
 - a. Ammonical copper arsenite or 5% solution of pentachlorophenol

2.3 MATERIALS – MISCELLANEOUS

- A. All materials of this Section, unless specifically otherwise approved in advance by the Architect, shall meet or exceed the following:
 - 1. Steel Hardware
 - a. ASTM A-7 or A-36 (Use galvanized at exterior locations)
 - 2. Machine Bolts

- a. ASTM A-307
- 3. Lag Bolts
 - a. Federal Specifications FF-B-561
- 4. Nails
 - a. Common (Except as noted) Federal Specifications FF-N-1-1 (Use galvanized at exterior locations)
- 5. Flashing
 - a. Nervastral Seal Prof HD-20 except where metal is indicated. Nervastral Seal Prof HD shall be installed on all sills and heads ½" inward from outside face of wall and extended 6" on each side of opening brick veneer construction. The sheeting shall not be allowed to hang free prior to completion of brick work but shall be secured to the siding with nails and discs or furring strips.
- 1. Other Materials: All other materials not specifically described but required for a complete and proper installation as indicated on the drawings, shall be new, suitable for the intended use, and subject to the approval of the Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Stockpiling: Stockpile all materials sufficiently in advance of need to ensure their availability in a timely manner for this work.
- B. Delivery Schedules: Make as many trips to the job site as are necessary to deliver all materials of this section in a timely manner to ensure orderly progress of the total work.
- C. Compliance: Do not permit materials not complying with the provisions of this section of these specifications to be brought onto or to be stored at the job site; immediately remove from the job site all non-complying materials and replace them with materials meeting the requirements of this section.
- D. Inspection: Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
 - 1. Verify that rough carpentry may be performed in strict accordance with the original design and all pertinent codes and regulations.
- E. Discrepancies: In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
- F. Workmanship: All rough carpentry shall produce joints true, tight, and well nailed with all members assembled in accordance with the drawings and with all pertinent codes and regulations.
- G. Selection of Lumber Pieces: Carefully select all members; select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing or making proper connections.
 - 1. Cut out and discard all defects which render a piece unable to serve its intended functions; lumber may be rejected by the Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.
- H. Shimming: Do not shim sills, joists, short studs, trimmers, headers, lintels, or other framing components.
- I. Treated Lumber: Use only treated lumber for all wood blocks and nailing grounds, etc. (other than foundation grade redwood) in, or in contact with, concrete.

- J. Treatment: Treat all wood less than two feet above finished grade by spraying with the preservative specified in this section of these specifications, to a minimum distance of six inches from the ends, or otherwise treat as approved in advance by the Architect. Perform all treatment in strict accordance with published recommendations of the manufacturer of the treatment preservative.
- K. General Framing: In addition to all framing operations normal to the fabrication and erection indicated on the drawings, install all backing required for the work of other trades. Set all horizontal or sloped members with crown up. Do not notch, bore, or cut members for pipes ducts conduits, or other reasons except as shown on the drawings or as specifically approved in advance by the Architect.
- L. Bearing: Make all bearings full unless otherwise indicated on the drawings. Finish all bearing surfaces on which structural members are to rest so as to give sure and even support; where framing members slope, cut or notch the ends as required to give uniform bearing surface.
- M. Blocking: Install all blocking required to support all items of finish and to cut off all concealed draft openings, both vertical and horizontal, between ceiling and floor areas.
 - 1. All other locations where openings could afford passage for rodents or flames.
 - 2. Fire-block in the following specific locations:
 - a. In all stud walls at ceiling and floor levels.
 - b. In all stud walls, including furred spaces, so that the maximum dimension of each concealed space is not more than eight feet.
 - c. All other locations where openings could afford passage for rodents or flames.
- N. Stud Walls and Partitions: Make all studs single length, unspliced, and platform framed.
- O. Corners and intersections: Unless otherwise indicated on the drawings, frame all corners and intersections with three or more studs and all required bearing for wall finish.
- P. Alignment: On all framing members to receive a finished wall or ceiling, align the finish subsurface to vary not more than 1/8 inch from the plane of surfaces of adjacent framing and furring members.
- Q. Nailing: Use only common wire nails or spikes except where otherwise specifically noted in the drawings.
 - 1. Provide penetration into the piece receiving the point of not less than 1/2 the length of the nail or spike provided, however, that 16 d nails may be used to connect two pieces of the two inch (nominal) thickness.
 - 2. Do all nailing without splitting wood, preboring as required; replace all split members.
- R. Bolting: Drill holes 1/16 inch larger in diameter than the bolts being used; drill straight and true from one side only. Bolt threads must not bear on wood; use washers under head and nut where both bear on wood; use washers under all nuts.
- S. Screws: For lag screws and wood screws, prebore holes same diameter as root of thread; enlarge holes to shank diameter for length of shank.
 - 1. Screw all lag screws and wood screws. Do NOT Drive screws.
- T. Installation of Building Paper: Install the specified building paper over all exterior framing members where indicated to be installed, lapping all joints to prevent penetration of water into the stud spaces, and securely fastening the paper in place in accordance with the manufacturer's published recommendations.
- U. Cleaning Up: Keep the premises in a neat, safe and orderly condition at all times during execution of this portion of the work, free from accumulation of sawdust, cut-ends, and debris.

END OF SECTION

SECTION 06192 - METAL PLATE CONNECTED WOOD 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.
 - 2. Truss accessories.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 5 Section "Metal Fabrications" for rough hardware anchoring trusses to concrete or masonry structures.
 - 2. Division 6 Section "Rough Carpentry" for roof and floor sheathing of structural-use panels and dimension lumber for supplementary framing and permanent bracing.

1.3 DEFINITIONS

- A. Metal-plate-connected wood trusses include planar structural units consisting of metal-plate-connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Engineer, fabricate, and erect metal-plate-connected wood trusses to withstand design loads within limits and under conditions required.
 - 1. Design Loads: As indicated.
 - 2. The truss manufacture shall design the trusses for the sprinkler piping load and to provide adequate support at the connection points.
- B. Engineering Responsibility: Engage a fabricator who uses a qualified professional engineer to prepare calculations, Shop Drawings, and other structural data for metal-plate-connected wood trusses.

1.5 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
 - 1. Product Data for lumber, metal-plate connectors, metal framing connectors, bolts, and fasteners.
- B. Shop Drawings detailing location, pitch, span, camber, configuration, and spacing for each type of truss required; species, sizes, and stress grades of lumber to be used; splice details; type, size, material, finish, design values, and orientation and location of metal connector plates; and bearing details.
 - 1. To the extent truss design considerations are indicated as fabricator's responsibility, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 2. Include truss Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Product certificates signed by officer of truss fabricating firm certifying that metal-plate-connected wood trusses supplied for Project comply with specified requirements and Shop Drawings.
- D. 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.

- E. Material test reports from a qualified independent testing agency indicating and interpreting test results relative to compliance of fire-retardant-treated wood products with requirements indicated.
- F. Material certificates for dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee (ALSC) Board of Review.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed wood truss installation similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Fabricator's Qualifications: Engage a firm that complies with the following requirements for quality control and is experienced in fabricating metal-plate-connected wood trusses similar to those indicated for this Project and with a record of successful in-service performance:
 - 1. Fabricator participates in a recognized quality-assurance program that involves inspection by SPIB; Timber Products Inspection, Inc.; Truss Plate Institute (TPI); or other independent inspecting and testing agency acceptable to Architect and authorities having jurisdiction.
- C. Comply with applicable requirements and recommendations of the following publications:
 - 1. ANSI/TP1 1, "National Design Standard for Metal-Plate-Connected Wood Truss Construction."
 - 2. TPI HIB "Commentary and Recommendations for Handling Installing & Bracing Metal Plate Connected Wood Trusses."
 - 3. TPI DSB "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."
- D. Metal-Plate Connector Manufacturer's Qualifications: A manufacturer that is a member of TPI and that complies with TPI quality-control procedures for manufacture of connector plates published in ANSI/TPI 1.
- E. Single-Source Responsibility for Connector Plates: Provide metal connector plates from one source and by a single manufacturer.
- F. Wood Structural Design Standard: Comply with applicable requirements of AFPA's "National Design Specification for Wood Construction" and its "Supplement."
- G. Single-Source Engineering Responsibility: Provide trusses engineered by metal-plate connector manufacturer to support superimposed dead and live loads indicated, with design approved and certified by a qualified professional engineer.
- H. Professional Engineer Qualifications: A professional engineer who is legally authorized to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated that have resulted in installing metal-plate-connected wood trusses similar to those indicated for this Project and with a record of successful in-service performance.
 - 1. **NOTE: At the Completion of Truss Erection, the Contractor shall provide a Truss Inspection of the installed trusses and permanent bracing by an Engineer Registered in the State of Alabama. The Engineer's Report shall certify the trusses are Correctly Installed, using specified wood grade and configured to meet the design of the supplier. His signed Seal shall be affixed to the report and submitted to the Architect and Engineer Of Record.**

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Handle and store trusses with care and comply with manufacturer's written instructions and TPI recommendations to avoid damage and lateral bending.
- B. Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

1.8 SEQUENCING AND SCHEDULING

- A. Time delivery and erection of trusses to avoid extended on-site storage and to avoid delaying progress of other trades whose work must follow erection of trusses.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Metal Connector Plates:
 - a. Alpine Engineered Products, Inc.
 - b. Computrus, Inc.
 - c. Mitek Industries, Inc.
 - d. Robbins Manufacturing Company.
 - e. Tee-Lok Corporation.
 - f. Truswal Systems Corporation.
 - 2. Metal Framing Anchors:
 - a. Cleveland Steel Specialty Co.
 - b. Harlen Metal Products, Inc.
 - c. Silver Metal Products, Inc.
 - d. Simpson Strong-Tie Company, Inc.
 - e. Southeastern Metals Manufacturing Co., Inc.
 - f. United Steel Products Co.

2.2 DIMENSION LUMBER

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.
- B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
 - 1. SPIB - Southern Pine Inspection Bureau.
- C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
- D. Provide dressed lumber, S4S, manufactured to actual sizes required by DOC PS 20 for moisture content specified, to comply with requirements indicated below:
 - 1. Provide dry lumber with 19 percent maximum moisture content at time of dressing.
- E. Grade and Species: Provide visually graded dimension lumber for truss chord and web members, of the following grade and species:
 - 1. Grade for Chord Members: No. 2.
 - 2. Grade for Web Members: No. 2.
 - 3. Species: Southern pine graded per SPIB rules.

2.3 METAL CONNECTOR PLATES

- A. General: Fabricate connector plates from metal complying with requirements indicated below.
- B. Hot-Dip Galvanized Steel Sheet: Structural-quality steel sheet, zinc coated by hot-dip process

complying with ASTM A 653, G60 coating designation; Grade 33 and not less than 0.0359 inch thick.

- C. Electrolytic Zinc-Coated Steel Sheet: ASTM A 591, structural-(physical) quality steel sheet, zinc coated by electrodeposition; 33,000-psi minimum yield strength, coating class C, and not less than 0.0474 inch thick.

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified below for material and manufacture.
 - 1. Where truss members are exposed to weather or to high relative humidities, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of stainless steel, Type 304 or 316.
- B. Nails, Wire, Brads and Staples: FS FF-N-105.
- C. Power-Driven Fasteners: CABO NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts and Screws: ASME B18.2.1.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

2.5 METAL FRAMING ANCHORS

- A. General: Provide metal framing anchors of structural capacity, type, size, metal, and finish indicated that comply with requirements specified, including the following:
- B. Research or Evaluation Reports: Provide products for which model code research or evaluation reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with building code in effect for this Project.
- C. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- D. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 coating designation; structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.
- E. Stainless-Steel Sheet: ASTM A 666, Type 304 or 316, chromium nickel steel sheet; 33,000-psi minimum yield strength.

2.6 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.

2.7 FABRICATION

- A. Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.
- B. Fabricate metal connector plates to size, configuration, thickness, and anchorage details required to withstand design loadings for types of joint designs indicated.
- C. Assemble truss members in design configuration indicated using jigs or other means to ensure uniformity and accuracy of assembly with joints closely fitted to comply with tolerances of ANSI/TPI 1. Position members to produce design camber indicated.
 - 1. Fabricate wood trusses within manufacturing tolerances of ANSI/TPI 1.
- D. Connect truss members by metal connector plates located and securely embedded simultaneously into both sides of wood members by air or hydraulic press.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Do not install wood trusses until supporting construction is in place and is braced and secured.
- B. Before installing, splice trusses delivered to Project site in more than one piece.
- C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.
- D. Install and brace trusses according to recommendations of TPI and as indicated.
- E. Install trusses plumb, square, and true to line and securely fasten to supporting construction.
- F. Space, adjust, and align trusses in location before permanently fastening and as follows:
 - 1. Truss Spacing: As indicated.
- G. Anchor trusses securely at all bearing points using metal framing anchors. Install fasteners through each fastener hole in metal framing anchor according to manufacturer's fastening schedules and written instructions.
- H. Securely connect each truss ply required for forming built-up girder trusses.
 - 1. Anchor trusses to girder trusses as indicated.
- I. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
 - 1. Install and fasten strongback bracing vertically against vertical web of parallel-chord floor trusses at centers indicated.
- J. Install wood trusses within installation tolerances of ANSI/TPI 1.
- K. Do not cut or remove truss members.
- L. Return wood trusses that are damaged or do not meet requirements to fabricator and replace with trusses that do meet requirements.
 - 1. Do not alter trusses in the field.

3.2 REPAIRS AND PROTECTION

- A. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

END OF SECTION

SECTION 06200 - FINISH CARPENTRY

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. Definition: Finish carpentry includes carpentry work which is exposed to view, is non-structural, and which is not specified as part of other sections. Types of finish carpentry work in this section include:
 - 1. Plywood Ceilings
 - 2. Wood Shelving

1.3 SUBMITTALS

- A. Product Data: Indicate Product description including product information and compliance with specified performance requirements.
- B. Shop Drawings: Submit Shop Drawings for work of this Section in accordance with section 01600. Indicate plans, sections, dimensions, component sizes, edge details, 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 receptacles and other items installed in the specified product.
- C. Samples: Submit samples in accordance with Section 01300. Submit minimum 2' x 2' samples.
 - 1. Cut sample and seam together for representation of inconspicuous seam. Indicate full range of pattern variation. Approved samples will be retained as standards for work.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect finish carpentry materials during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Do not deliver finish carpentry materials, until operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

PART 2 - PRODUCTS

2.1 MATERIALS - INTERIOR

- A. Plywood Ceilings
 - 1. *Exposed* Plywood Panels shall be 1/2" B/C Sanded Grade, 4 x 8 plywood, painted.
 - a. All seams/joints shall be covered with 3/4" wide batten strips, painted.
 - 2. *Exposed* Plywood Panels shall be 5/8" B/C Sanded Grade, 4 x 8 plywood, painted.
 - a. All seams/joints shall be covered with 3/4" wide batten strips, painted.
 - 3. Plywood Panels shall be 5/8" x 4' x 8', C/D T&G plywood.
 - a. All seams/joints shall be covered with 3/4" wide batten strips, painted.
 - b. If 5/8" CD T&G is not available in the market area, contractor shall use 3/4" CD T&G.
 - 4. T1-11 Panels, 11/32" x 4' x 8', Reverse board and batten with 8" on-center grove spacing. Scratch sand finish. Class III or C fire code.

- a. Provide interior corner and edge trim as required for finish look.
- B. Wood Shelving
 1. "B" or better white pine. To be Painted.
 - a. On shelves wider than 12" use ¾" A/C plywood with hard wood edge.
 - b. Wood shelving shall be height and depth indicated on drawings
 - c. Shelving shall be adjustable shelves on KV standards.

2.2 FABRICATION

- A. Nominal sizes are indicated, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber, as applicable, manufactured to the actual sizes as required by PS 20 or to actual sizes and pattern as shown, unless otherwise indicated.
- B. Moisture Content of Softwood Lumber: Provide kiln-dried (KD) lumber having a moisture content from time of manufacture until time of installation not greater than values required by the applicable grading rules of the respective grading and inspecting agency for the species and product indicated.
- C. Fasteners and Anchorages: Provide nails, screws and other anchoring devices of the proper type, size, material and finish for application indicated to provide secure attachment, concealed where possible, and complying with applicable Federal Specifications.
 1. Where finish carpentry is exposed on exterior or in areas of high relative humidity, provide fasteners and anchorages with a hot-dipped zinc coating (ASTM A 153).
- D. Inspect each piece of lumber and plywood or each unit of finish carpentry after drying; do not use twisted, warped, bowed or otherwise damaged or defective wood.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition wood materials to average prevailing humidity conditions in installation areas prior to installing.
- B. Back-prime lumber for finish exposed on the exterior or to moisture and high relative humidity on the interior. Comply with requirements of section on painting within Division 9 for primers and their application.

3.2 INSTALLATION

- A. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacturer with respect to surfaces, sizes or patterns.
- B. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level countertops; and with 1/16" maximum offset in flush adjoining and 1/8" maximum offsets in revealed adjoining surfaces.
- C. Scribe and cut work to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
- D. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, to produce tight fitting joints with full surface contact throughout length of joint. Use scarf joints for end-to-end joints.
- E. Anchor finish carpentry work to anchorage devices or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fasteners heads are required, use fine finishing nail for exposed nailings, countersunk and filled flush with finished surface, and matching final finish where transparent is indicated.

3.3 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

- A. Repair damaged and defective finish carpentry work wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean finish carpentry work on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.
- C. Refer to Division 9 for final finishing of installed finish carpentry work.
- D. Protection: Installer of finish carpentry work shall advise Contractor of final protection and maintained conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION

SECTION 06240 – PLASTIC LAMINATE COUNTERTOPS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Plastic Laminate Countertops.
- B. Plastic Laminate Splashes.

1.2 RELATED REQUIREMENTS

- A. Section 06100 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- B. Section 04412 – Granite Counters.
- C. Section 06241 – Solid Surface Fabrications - Counters.

1.3 REFERENCE STANDARDS

- A. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2009.
- B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.
- C. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.
- D. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.
- E. PS 1 - Structural Plywood; 2009.

1.4 SUBMITTALS

- A. See Section 01600 - Product Requirements, for submittal procedures.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show locations and sizes of cutouts and holes as required for items installed in plastic-laminate countertops.
- C. Product Data: Provide data for hardboard, medium density fiberboard, particleboard, plywood, high pressure decorative laminate, adhesive for bonding plastic laminate, thermoset decorative overlay, and accessories.
- D. Initial Samples: Provide manufacturers full range samples.
- E. Verification Samples: Submit four actual samples minimum 12 inches square, for each plastic laminate color, pattern and surface finish as selected by architect for verification and final selection(s).
- F. Product Certificates: Signed by manufacturers of laminate certifying that products furnished comply with requirements.
 - 1. High Pressure decorative laminate.
 - 2. Chemical Resistant, high pressure decorative laminate.
 - 3. Adhesives.
- G. 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 address of architects and owners, and other information specified.
- H. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
- I. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
 - 1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
- B. Perform work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Premium quality, unless other quality is indicated for specific items.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience. Member in good standing of the Architectural Woodwork Institute (AWI) and familiar with the AWI/AWMAC QSI.
- D. Quality Certification: Provide inspection and quality certification of completed custom cabinets in accordance with AWI/AWMAC Quality Certification Program.
- E. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 MOCK-UP

- A. Provide mock-up of typical laminate top.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

1.7 PRE-INSTALLATION MEETING

- A. Convene not less than one week before starting work of this section.

1.8 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that countertops can be supported and installed as indicated.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver countertops until painting and similar operations that could damage countertops have been completed in installation areas. If woodwork must be stored in other installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.10 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.
 - 1. Locate concealed framing, blocking, and reinforcements that support countertops by field measurements before being enclosed and indicate measurements on shop drawings.
 - 2. Established Dimensions: Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating countertops without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 – PRODUCTS

2.1 PLASTIC LAMINATE COUNTERTOPS

- A. Quality Standard: Unless otherwise indicated provide products of quality specified by AWI//AWMAC/WI Architectural Woodwork Standards for grades indicated for construction, installation and other requirements.
 - 1. Provide labels from AWI certification program indicating that countertops comply with requirements of grades specified.
 - 2. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.
- B. 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.
- C. Adhesives or fasteners to be provided for securing of tops to cabinet work. Such materials to allow for contraction or expansion of tops where necessary.
- D. Laminate Type: Fire rated type, 0.050" thick; UL tested and labeled ratings of 25 for flame spread, 25 for fuel contributed and 100 for smoke developed when bonded to wood particle board.
- E. High-Pressure Decorative Laminate: NEMA LD 3, Grade HGS.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Formica Corporation.
 - b. Nevamar; a Panolam Industries International, Inc. brand.
 - c. Wilsonart International Holdings, Inc.
- F. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1. As Selected by Architect from manufacturers solid and pattern range.
 - 2. A maximum of Two (2) colors per project.
 - 3. Grain Direction: Parallel to cabinet fronts (If applicable).
- G. Core Material: Particleboard or medium-density fiberboard.
- H. Core Material at Sinks: Marine-grade plywood, medium-density fiberboard made with exterior glue or exterior-grade plywood
- I. Core Thickness: 3/4 inch.
 - 1. Build up countertop thickness to 1-1/8" inch, unless otherwise specified, with additional layers of core material laminated to top.
- J. Edge Treatment: All exposed edges must be same laminate cladding on horizontal surfaces.
 - 1. Build up front edge thickness to 1-1/8" inch, unless otherwise specified, with additional core material laminated to top.
- K. Backer Sheet: Provide plastic-laminate backer sheet, NEMA LD 3, Grade BKL, on underside of countertop substrate.
- L. Paper Backing: Provide paper backing on underside of countertop substrate.
- M. Splashes: All Countertops shall be provided with 4" high back splashes and side splashes with thickness matching countertop thickness where shown and where tops abut walls, columns, case ends, adjacent cabinets, etc.
 - 1. All exposed edges, including back and end splashes, must be covered with the same laminate as countertop surfaces.

2.2 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.
 - 1. Wood Moisture Content: 5 to 10 percent.
- B. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Medium-Density Fiberboard: ANSI A208.2, Grade 130.
 - 2. Particleboard: ANSI A208.1, Grade M-2.
 - 3. Softwood Plywood: DOC PS 1.

2.3 SHOP TREATMENT OF WOOD MATERIALS

- A. Fire Retardant Treatment (FR-S Type): Chemically treated and pressure impregnated; capable of providing flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.
- B. Provide UL approved identification on fire retardant treated material.
- C. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

2.5 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
- B. Fasteners: Size and type to suit application.
- C. Concealed Joint Fasteners: Threaded steel.

2.6 HARDWARE

- A. Grommets for Cable Passage through Countertops: Mockett BRV1, Satin Nickel finish.
- B. Metal Slot Grommet: Mockett Max2/D-94, Satin aluminum finish.
- C. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 - 1. Satin Nickel unless otherwise indicated in this specification.
- D. Countertop Supports: Powder coated, formed metal supports. Must provide attachment points between countertop and wall.

2.8 FABRICATION

- A. Sand wood lightly to remove raised grain on exposed surfaces before fabrication.
- B. Fabricate countertops to dimensions, profiles, and details indicated.
- C. Ease edges to radius indicated for the following:
 - 1. Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.
- D. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.
- E. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of openings in countertops with a coat of varnish.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify adequacy of blocking and support framing.

3.2 INSTALLATION

- A. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
 - 1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items.
 - 2. Seal edges of cutouts by saturating with varnish.
- B. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
 - 1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten according to manufacturer's written instructions to exert a constant, heavy- clamping pressure at joints.
- C. When splice joints are required, they shall be joined as needed for a gapless joint.
- D. Install countertops level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
- E. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- F. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.
- G. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 1. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
Secure backsplashes to walls with adhesive.
 - 2. Seal junctures of tops, splashes, and walls with mildew-resistant colored silicone sealant or another colored permanently elastic sealing compound recommended by countertop material manufacturer. Sealant color shall be color-match to countertop laminate.

3.3 ADJUSTING

- A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects; where not possible to repair, replace countertop. Adjust joinery for uniform appearance.
- B. Clean countertops on exposed and semi exposed surfaces. Touch up shop applied finishes to restore damaged or soiled areas.

3.4 PROTECTION

- A. The contractor is responsible for protection of countertops during construction through final inspection. Contractor shall use protection products approved by the laminate manufacturer.

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. Window Sills
 - 2. 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

- 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:

| | | |
|-------------------------|---|-----------------------------------|
| 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

- A. Window Sills, Trims: 3/4" thick solid surfacing material, adhesively joined with inconspicuous seams, edge details as indicated on Drawings or from manufacturers standards. Colors to be selected by Architect from manufacturer's full color range.
- B. 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.
- C. 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.
- D. 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.
- E. 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:
 - 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

- 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

- 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. Blanket type building above new ceiling
 - 2. Cavity Wall Insulation.
 - 3. Foam Insulation at CMU Cells

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.
- 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: 30 (minimum) as follows:

Provide and install Insulation Baffles equal to Owens Corning Raft-R-Mate Attic Rafter Vents with Air Stop/Insulation Block. Extruded Polystyrene; Air Channel Depth, 1.5"; Net Free Air Flow, 22.3 sq.in.; Dimension to fit between rafters. Install per manufacturer's instructions.

2.2 CAVITY WALL INSULATION - POLYSTYRENE

A. MANUFACTURERS:

1. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function.
 - a. Styrofoam SM/SB; Dow Chemical USA.
 - b. Foamular 250; UC Industries.
 - c. Certifoam, Minnesota Diversified Products, 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. Extruded Polystyrene Board Insulation: Rigid cellular polystyrene thermal insulation with closed cells and integral high density skin, formed by the exposition of polystyrene base resin in an extrusion process to comply with ASTM C 578, Type IV; 5-year aged
2. All Cavity Walls: Provide rigid thermal insulation at the cavity space.
 - a. R-value of 5.0 Btu/ (hr x sf x degree F) at 75 degree F in manufacturer's standard lengths and widths
 - b. 1" thick, 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 Insulaton 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.**

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 07220 - FIRE/SMOKE STOP 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 firestopping work shall be as follows:
 - 1. Through-penetration firestopping in fire rated construction.
 - 2. Construction-gap firestopping at connections of the same or different materials in fire rated ceiling.
 - 3. Construction -gap firestopping occurring within fire rated wall, floor to floor assemblies.
 - 4. Construction-gap firestopping at expansion joints.
 - 5. Construction-gap firestopping at abutments to existing construction.
 - 6. Construction-gap firestopping occurring at the top of fire rated walls.
 - 7. Through-penetration smoke-stopping in smoke partitions.
 - 8. Construction-gap smoke-stopping in smoke partitions.

1.3 SUBMITTALS

- A. Submit product data and manufacturer's certificate that the product meets or exceeds specified requirements.
- B. Before commencing work, submit in accordance with local code.
- C. Submit independent laboratory test reports, data sheets, physical properties, and samples as required by local code officials.
- D. Submit the technical data sheet from the manufacturer showing the test results from the ASTM E84 (Surface Burning Characteristics).

1.4 QUALITY ASSURANCES

- A. Applicator performing work under this section must be trained by the manufacture in the art of applying related material.

1.5 DELIVERY AND STORAGE OF MATERIALS

- A. All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

PART 2 - PRODUCTS

2.1 DESIGN CONDITIONS

- A. Thermafibersafing insulation or equal shall be one hour and two hour fire tested under simulated field conditions using ASTM E119 guidelines.
 - 1. ASTME 814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
 - 2. International Building Code, 2015 edition.
- B. All materials, unless otherwise indicated, shall be supplied by United States Gypsum Company or Tremco Firestopping Systems and shall be installed according to current printed directions.

- C. Systems or devices listed in the U.L. Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that it conforms to the construction type, penetrant type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall applications. Systems or devices must be asbestos-free.
- D. All firestopping products must be from a single manufacturer. All trades shall use products from the same manufacturer.
- E. Sealing Compound: Thermafiber Smoke Seal compound or equal, smoke resistant, in 30 oz. cartridges.

PART 3 - EXECUTION

- A. Verify openings are ready to receive the work of this section.
- B. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- C. Remove incompatible materials which may affect bond.
- D. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- E. Fire Sealant Application: Seal all joints with 3/8" bead of Thermafiber Smoke Seal compound or equal. Top off safing insulation in all poke-through openings with minimum 2" depth of Thermafiber Smoke Seal compound, or equal.

END OF SECTION

SECTION 07310
ARCHITECTURAL SHINGLES

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 work under this section consists of all composition asphalt shingle 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:
1. Underlayment.
 2. Dimensional Fiberglass Asphalt Shingle Roofing.
 3. Ridge Vent System.
 4. Roof Vents.
 5. Sheet Metal items furnished and installed in accordance with Section 07600, Flashing and Sheetmetal.

1.3 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. ***(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
Millbrook, AL / (334) 590-7999 / dlee@roof-asset.com
 - b. Professional Roof Observers, LLC.
1200 Sumac Road
Pulaski, TN 38478
Kevin Turner / (931) 703-6018 / kturner@professionalroofobservers.net.

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- 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.

- B. Manufacturer Qualifications: Company specializing in Asphalt Roofing Products with fifteen (15) years minimum experience. Provide primary roofing material products from a single source including composition asphalt shingles, preformed ridge & hip cap shingles, starter strip and underlayments all produced by a single manufacturer. Provide secondary products only as recommended by manufacturer of primary products for use with roofing system specified. Being listed as pre-qualified manufacturer does not release manufacturer from providing complete, current, and acceptable test data for each performance, thermal, and wind load requirement specified.

- C. Installer's Qualifications: Installer / sub-contractor must be currently in the primary business of roofing with not less than (5) five consecutive years of recorded successful experience with roofing systems comparable to that of this project under the same company name. Installer shall be licensed or otherwise authorized by state and local authorities to install all products specified in this section. **Installer shall be certified by the roofing material manufacturer as trained and approved for installation of such roofing materials indicated for this project.** Installer shall perform work in accordance with NRCA Roofing and Waterproofing Manual. Joint ventures shall not be allowed.

- D. A full-time field supervisor or foreman with minimum of (5) years of experience in a roofing supervisory role, having performed on projects of comparable scope and type shall be required to be on site at all times during roofing work. Any roofing installed during times when the supervisor/foreman is not on site is subject to rejection.

- E. The Roofing Contractor shall be responsible for weather-tightness of the entire roofing system.

- F. The Roofing Contractor shall inspect and accept condition of the roof deck and components of mechanical penetrations prior to installation of the roofing system.

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1.4 ASSEMBLY REFERENCE STANDARDS

- A. Underwriters Laboratories Fire Test of Roof Deck Construction Standard 1256.
- B. Underwriters Laboratories Test for Wind Uplift resistance of Roof Deck
- C. Assemblies Standard 580.
- D. ASTM D 3161 Class F Wind Resistance
- E. ASTM D 7158, Class H Wind Resistance.
- F. ASTM D 3462 – Standard Specification for Asphalt Shingle Made from Glass Felt and Surfaced with Mineral Granules.
- G. ASTM D 3018 – Standard Specification for Class A Shingles Surfaced with Mineral Granules.
- H. ASTM E108 Fire Resistance: Class A
- I. UL 790 Fire Resistance: Class A
- J. Roof Deck Manufacturers Design Manual.
- K. NRCA – “The NCRA Roofing and Waterproofing Manual”
- L. 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

1.5 ROOFING PERFORMANCE REQUIREMENTS

- A. The roof deck assembly shall exhibit the following performance characteristics:
 - 1. Wind Uplift Rating - FM 1-135 (or per local codes whichever is greater.)
 - 2. Factory Mutual Classifications - FM Class 1
 - 3. Fastener Withdrawal Strength - 40 lbs. min. (or per local codes whichever is greater.)
- B. Composition Asphalt Shingles shall be self-sealing and provided resistant to wind damage as tested up to **130 MPH** winds.
- C. Certification of Roofing System: Contractor(s), Roofing Material Manufacturer, and Roofing Material Manufacturer’s Field Inspector shall provide a final inspection to verify proper installation and execute the Certification of Roofing System.

1.6 SUBMITTALS

- A. Product Data: Submit manufacturer's warranty, technical product data, test reports, maintenance data, installation instructions and recommendations for each type of roofing product required. Include highlighted data substantiating that materials comply with requirements. Include similar color charts of trim and accessories involving color selection.
- B. Submit a sample panel to match existing adjacent shingles for approval (If required).
- C. Installer’s Qualification Data
- D. Sample Warranty

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and storage of material: Store and handle roof materials in a manner which will ensure that there is no possibility of significant moisture pick up. Store in a dry, well ventilated, weather tight place. Unless protected from weather or other moisture sources, do not leave unused roofing materials on the roof surface overnight or when roofing work is not in progress. Store rolls

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of materials and other materials on pallets or other raised surface. Handle and store materials or equipment in a manner to avoid significant or permanent deflection of deck. All material must be protected from the weather by protective tarps. Manufacturer's plastic covers are not acceptable means of protection.

- B. Scheduling and coordinating work: Schedule and coordinate roofing and sheet metal installations with the work of other trades where it is integral or contiguous therewith. Materials furnished under this section, which are to be built-in by other trades, shall be delivered to the site in sufficient time to avoid delays to construction progress. Instruct other trades concerning the location and placement of reglets, wood nailers and cleats.
- C. Proper surfaces: Surfaces to which roofing, and sheet metal are to be applied shall be even, smooth, sound, thoroughly clean and dry, and free from projection nail heads or other defects that would affect the application. Report in writing any unsatisfactory surfaces to the Architect in advance of roofing work.
- D. Dis-similar metals: Where dis-similar metals abut, the juncture shall be executed in a manner that will facilitate drainage and thus minimize the possibility of galvanic action.
- E. Accessories: All accessories or other items essential to the completeness of the sheet metal installation shall be provided as required. All such items, unless otherwise indicated on the drawings or specified, shall be of the same kind of materials as the item to which applied, and the gauges shall conform to recognized industry standards of sheet metal practice.
- F. Solvent-based materials: Store and dispose of solvent-based materials and materials used with solvent based materials, in accordance with requirements of local authorities having jurisdiction.
- G. Extra Material: Furnish to owner
 - 1. Provide 400 square feet (4 square) of extra shingles of each color specified.

1.8 PROJECT CONDITIONS

- A. Substrate: Proceed with shingle work only after substrate construction and penetrating work have been completed.
- B. Weather Conditions: Proceed with shingle work only when weather conditions are in compliance with manufacturer's recommendations and when substrate is completely dry.

1.9 ROOFING GUARANTEE

- A. Contractor's Roofing Guarantee
 - 1. All work included in this section shall be jointly and unconditionally guaranteed by the General Contractor and the Contractor for this section, against leaks from faulty or defective materials and workmanship for a period of Five (5) Years starting on the date of acceptance of the project by the Owner.
 - 2. Contractor shall furnish Contractors 5 Year Roofing Guarantee. This roofing guarantee is included in the front-end documentation of this project manual.
 - a. The roofing guarantee shall be executed in three (3) original copies, signed by the appropriate parties, and submitted to the Architect, Owner, and the appropriate County / City Departments if required.
 - 3. Warranty shall include the following: The General Contractor and Roofing Installer shall be responsible for all water damaged materials due to roof leaks for a period of 5 years.
- B. Manufacturer's Warranty
 - 1. 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

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language, and substituting the requirement that the Laws of the State of Alabama shall govern all such warranties.

2. The Contractor shall provide to the Roofing manufacturer's fully executed shingle warranty on shingle materials.
 - a. Material Warranty Period: Forty (40) years from Date of Substantial Completion. Failures include, but are not limited to, the following:
 - i. Manufacturing defects.
 - ii. Structural failures including failure of asphalt shingles to self-seal after a reasonable time.
 - b. Non-prorated (Labor & Material) Warranty Period: 25 Year Non-Prorated Warranty Period covering material and labor costs for repair or replacement.
 - c. Algae Discoloration Warranty Period: Asphalt shingles will not discolor fifteen (15) years from Date of Substantial Completion.
 - d. Wind Warranty: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 130 MPH for Fifteen (15) years from Date of Substantial Completion.
 3. Insulated Decks and Radiant Barriers
 - a. Manufacturer's warranty, including non-prorated period, will remain in force when shingles are applied to roof deck assemblies where foam insulation is prefabricated into the roof deck system, where insulation is installed beneath an acceptable roof deck system, or where radiant barriers are installed, with or without ventilation, directly below the deck.
 4. The roofing manufacturer shall be required to provide documentation certifying the roofing system and products specified comply 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.
- C. All roof warranties/guarantees shall be provided to the Owner, by the Contractor at the Final Inspection to obtain the Substantial Completion.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship, and function:
 1. Owens-Corning "Duration Series".
 2. GAF "Timberline High Definition HDZ Series".
 3. Tamko "Titan XT"
 4. CertainTeed "Landmark Series".

2.2 MATERIALS

- A. Glass-Fiber Reinforced Dimensional/Architectural Asphalt Shingles: Conforming to ASTM D 3161, ASTM D 7158, UL2390, ASTM E108, UL 790, UL Certified to meet ASTM D 3462, ASTM D 3018; glass fiber mat base; ceramically colored/UV resistant mineral surface granules across entire face of shingle; four-tab shingle with each tab independently colored by granules no bleed over of granules from previous tab.
 1. Color: As selected by Architect after bid date from manufacturer's standard selection.

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2. Shingle System to be complete with manufacturer's underlayment, starter shingles and hip and ridge shingles.
 3. Limitations: Use on roofs with slopes greater than 2:12 pitch. Low slope applications (2:12 to 4:12 pitch) require additional underlayment. Follow manufacturer's instructions for waterproofing in these areas per applications instructions on shingle package. On slopes greater than 2:12 pitch apply 1 inch diameter spots of asphalt roofing cement (ASTM D 4586 Type II) under the shingle tab corner according to application instructions provided on the shingle package.
- B. Underlayment:
1. Ice and Water Shield: Self-adhering waterproofing membrane underlayment: ASTM D 1970; minimum of 60-mil- thick sheet; glass-fiber-reinforced; SBS-modified asphalt; mineral-granule surfaced.
 - a. Provide at all valleys, ridges, penetrations, curbs, hips, roof edges, below copings, etc.
 2. Synthetic Underlayment/Felt: Polyolefin based scrim reinforced roofing underlayment: ASTM D4869; ASTM D 226; Fire resistance ASTM E 108, UL 790 Fire Resistant. UL classified as a Prepared Roofing Accessory.
 - a. Provide at all open field roof areas.
- C. Starter Shingles:
1. Starter Shingles: Primary shingle manufacturer's starter shingle: Starter must extend beyond primary field shingle nail penetration line. (Shall be located at the eaves and rakes or any other location where shingle roof begins. The nails should be positioned as near to the eave's edge as possible (max 3") while avoiding sealant.)
- D. Hip/ Ridge Shingles:
1. Hip and Ridge Shingles: Primary shingle manufacturer's pre-cut hip and ridge shingles applicable for wind warranty rating required under this Specification Section: ASTM 3018; ASTM 3462; ASTM E108, ASTM 3161
- E. Ridge Vent:
1. Rigid Ridge Vent: High-density polypropylene resin or other UV-stabilized plastic ridge vent: External wind deflector baffles; 18 sq. in. of net free area per linear foot; ASTM G155
- F. Intake Vents: (If required) - Attic roof vent that is an on-the-rooftop, intake ventilation product that lets fresh air in to balance ridge vents. Low profile to blend in with roof. Must have end caps/plugs for weather protection and finished appearance.
1. IN-VENT by Cor-A-Vent.
 2. Smart Vent by DCI attic Intake SV-TAP.
 3. Filtered Edge Vent by CertainTeed.
 4. Color to be selected by architect from manufacturer standards.
 5. Must be strictly installed according to manufacturer requirements.
- G. Gravity Vents:
1. High-Capacity Dome Roof Louver Style Gravity Vents; 144 square inches NFVA each; Galvanized Steel construction.
 2. Slant Roof Louver Style Gravity Vents; 50 square inches NFVA each; Heavy duty Galvanized construction.
 3. Finish: Site Painted with Shingle Color match system paint of shingle manufacturer.

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H. Fasteners:

1. Hot dip galvanized, sharp pointed, conventional ring-shank roof nails, 11 to 12 gauge, with minimum of 3/8" diameter flat heads, minimum of 1-1/4" – 1-1/2" length or of sufficient length to penetrate at least 3/4" into / beyond wood decking shall be used as required.
Pneumatically driven fasteners, nails, or staples will not be allowed to be used on this project.
2. Dry-in felt shall be fastened with large 1" head plastic cap nails.
3. Fasteners for metal flashing materials shall be heavy galvanized. Exposed fasteners for sheet metal flashings shall be screw-type with weather seal washers. Prefinished to match.

I. Asphalt Roofing Cement:

1. Roof cement shall be asbestos free non-hardening, elastic waterproof type ASTM 4586, Type II; Consistency as required by roofing material manufacturer for application.
2. All other required materials necessary for a complete job as recommended by the roofing manufacturer or as required by good practice.

2.3 MISCELLANEOUS SHEET METAL WORK

A. Work under this section includes all other incidental sheet metal items shown on drawings as accessories, trims, and flashings to the composition asphalt roof shingles that may not be specifically included in other sections of the specifications and/or work.

1. Install metal flashing in accordance with The NRCA Roofing and Waterproofing Manual per NRCA including but not limited to:
 - a. Step Flashing
 - b. Cricket Flashing
 - c. Rake and Eave Drip Edge Flashing
 - d. Apron Flashing
 - e. Pipe and Post Flashing
 - f. Lead Vent Pipe Flashing

B. Refer to Section 07600, Flashing and Sheetmetal, for additional information.

C. Miscellaneous Items

1. Install and flash all items furnished and set by others as specified, in accordance with good practice, properly flashed and bonded weathertight into roofing.

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, Department 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.

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- 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.
- D. 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 and the Owner.

3.2 PREPARATION OF SUBSTRATE

- A. Clean substrate of any projections and substances detrimental to shingling work.
- B. Coordinate installation of shingles with flashing and other adjoining work to ensure proper sequencing.

3.3 INSTALLATION – GENERAL

- A. General: Comply with instructions and recommendations of shingle manufacturer in relationship

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to low slop roof application, except to extent more stringent requirements are indicated.

- B. Installer of shingles must examine substrate and conditions under which shingling work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with shingling work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.4 APPLICATION OF UNDERLAYMENT AND ROOFING SHINGLES

- A. (Note: For roof replacement projects, the contractor shall remove the existing shingles, underlayment, and associated flashing components down to the existing deck substrate prior to the application of new underlayment and shingles. Contractor is to notify the Architect of any damaged / deteriorated roof decking. If directed by the Architect, the contractor shall replace damaged portions of the decking per the Unit Price on the proposal form.)
- B. Underlayment Application:
 - 1. Synthetic Underlayment:
 - a. Apply one layer of synthetic underlayment horizontally, free of wrinkles, over entire roof deck surface, lapping succeeding courses 2" minimum in direction to shed water, and lapping ends min. 4" with adjacent end laps staggered 60". Provide 18" each side of hips. Fasten 36" max. o.c. or as necessary to assure stable placement of felt underlayment until the shingles are installed. Fasten with nails (no staples).
 - b. Install saturated felt starter courses as per low slope application requirements lapped and cemented as indicated by the manufacturer.
 - 2. Self-Adhered Underlayment:
 - a. Install at all Valleys, Ridges, Hips and Eaves, Penetrations, Curbs, Rakes, Changes in Elevation, and Miscellaneous Roof Edges.
 - b. Install underlayment centered to the center of the valley. Extend minimum of 18" in each direction from middle of all valleys.
 - c. Install upward from the edge of all eaves a total distance of 36".
 - d. Install on all ridges and hips a minimum of 18" in each direction from middle of ridge / hip line.
 - e. Install 18" wide strip each side of expansion joint flange.
- C. Shingle Application:
 - 1. Install Composition Asphalt Shingles system, including but not limited to shingles, pre-formed ridge, and hip shingles in accordance with manufacturer's printed instructions and in accordance with The NRCA Roofing and Waterproofing Manual per NRCA.
 - 2. Install all shingles with uniform exposure as specified by the manufacturer.
 - 3. Install manufactured starter strips, pre-formed ridge, and hip shingles in strict accordance with manufacturer's printed requirements.
 - a. Provide starter strip at lowest roof edge and along rake edges.
 - b. Shingles shall extend $\frac{3}{4}$ " beyond roof edge flashing.
 - c. Fasten ridge shingle with nail of length sufficient to fully penetrate roof decking.
 - 4. Install base and wall cap flashings (where roofing meets masonry walls) in strict accordance with the roofing manufacturer's printed specifications.
 - 5. Provide closed cut valleys per manufacturer's printed instructions; initial layer to lap the valley without fasteners in the valley and upper layer to be cut back two inches parallel to valley center.

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6. Fasten shingles in locations as indicated by the shingle manufacturer's printed instruction according to roof slope and wind load requirements with no less than six (6) nails installed in each shingle regardless of manufacturer's approvals.
 7. The application of the shingles will be by hand nailing ONLY. Pneumatic nail guns will NOT be permitted for installation of shingles.
 8. "Racking" of the shingles will not be permitted.
 9. Staples will NOT be permitted.
 10. Lap cap shingles in direction away from prevailing winds.
- D. Install vent pipe in strict accordance with the manufacturer's instruction for application.
 - E. Properly flash all other penetrations in accordance with the roofing manufacturer's printed instructions.
 - F. Upon completion of application all shingles shall be properly nailed, with even /uniform exposure, and straight lines and free of loose, crooked, or buckled shingles. Entire installation shall be watertight and properly bonded to flashing.

END OF SECTION

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SECTION 07421 - METAL WALL PANELS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Flush-profile, concealed fastener metal wall panels, with related metal trim, and accessories.
 - 1. Exterior Wall Panels.

1.2 RELATED REQUIREMENTS

- A. Division 05 Section "Structural Steel Framing" for steel framing supporting metal panels.
- B. Division 05 Section "Cold-Formed Metal Framing" for cold-formed metal framing supporting metal panels.
- C. Division 07 Section "Thermal Insulation" for thermal insulation installed behind metal panels.
- D. Division 07 Section "Air Barriers" for air barriers within wall assembly and adjacent to wall assembly.
- E. Division 07 Section "Metal Soffit Panels" for soffit panels installed with metal wall panels.
- F. Division 07 Section "Sheet Metal Flashing and Trim" for sheet metal flashing items in addition to items specified in this Section.
- G. Division 13 Section "Metal Building Systems" for steel framing supporting metal panels.

1.3 REFERENCES

- A. American Architectural Manufacturer's Association (AAMA): www.aamanet.org:
 - 1. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) & Zinc-Aluminum Coated Steel Substrates.
 - 2. AAMA 809.2 Voluntary Specification Non-Drying Sealants.
- B. American Society of Civil Engineers (ASCE): www.asce.org/codes-standards:
 - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM): www.astm.org:
 - 1. ASTM A755 - Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
 - 2. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - 3. ASTM C920 - Specification for Elastomeric Joint Sealants.
 - 4. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
 - 5. ASTM D4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
 - 6. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - 7. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
 - 8. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.

- D. International Accreditation Service (IAS):

1. IAS AC472 Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems, Part B.

1.4 QUALITY ASSURANCE

- A. Manufacturer/Source: Provide metal panel assemblies and accessories from a single manufacturer accredited under IAS AC472, Part B.
- B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years experience in manufacture of similar products in successful use in similar applications.
 1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
 - a. Product data, including certified independent test data indicating compliance with requirements.
 - b. Samples of each component.
 - c. Sample shop drawings from similar project.
 - d. Project References: Minimum of five installations not less than three years old, with Owner and Architect contact information.
 - e. Sample warranty.
 - f. Certificate of accreditation under IAS AC472 Part B.
 2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
 3. Approved manufacturers must meet separate requirements of Submittals Article.
- C. Installer Qualifications: Experienced Installer with minimum of five years experience with successfully completed projects of a similar nature and scope.
 1. Installer's Field Supervisor: Experienced mechanic supervising work on site whenever work is underway.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Prior to erection of framing, conduct preinstallation meeting at site attended by Owner, Architect, metal panel installer, metal panel manufacturer's technical representative, inspection agency and related trade contractors.
 1. Coordinate building framing in relation to metal panel system.
 2. Coordinate openings and penetrations of metal panel system.
 3. Coordinate work of Division 07 Sections "Roof Specialties" and "Roof Accessories" and openings and penetrations and manufacturer's accessories with installation of metal panels.

1.6 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data sheets for specified products. Include data indicating compliance with performance requirements.
- B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener and sealant placement, flashings, openings, penetrations, and special details. Make distinctions between factory and field assembled work.
 1. Indicate points of supporting structure that must coordinate with metal panel system installation.
 2. Include structural data indicating compliance with performance requirements and requirements of local authorities having jurisdiction.
- B. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.

- C. Samples for Verification: Provide 12-inch- (305 mm-) long section of each metal panel profile. Provide color chip verifying color selection.

1.7 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Indicating compliance of products with requirements.
- B. Qualification Information: For Installer firm and Installer's field supervisor.
- C. IAS Accreditation Certificate: Indicating that manufacturer is accredited under provisions of IAS AC472 Part B.
- D. Manufacturer's warranty: Unexecuted sample copy of manufacturer's warranty.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Manufacturer's Warranty: Executed copy of manufacturer's warranty.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.
 - 1. Deliver, unload, store, and erect metal panels and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.
 - 2. Store in accordance with Manufacturer's written instruction. Provide wood collars for stacking and handling in the field.
 - 3. Shield foam insulated metal panels from direct sunlight until installation.

1.10 WARRANTY

- A. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail in materials and workmanship within one year from date of Substantial Completion.
- B. Special Panel Finish Warranty: On Manufacturer's standard form, in which Manufacturer agrees to repair or replace metal panels that evidence deterioration of factory-applied finish within the warranty period, as follows:
 - 1. **Fluoropolymer Two-Coat System:**
 - a. Basis of Design System: **MBCI, Signature 300.**
 - b. Color fading in excess of 5 Hunter units per ASTM D2244.
 - c. Chalking in excess of No. 8 rating per ASTM D4214.
 - d. Failure of adhesion, peeling, checking, or cracking.
 - e. Warranty Period: 40 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design Manufacturer: **MBCI Metal Roof and Wall Systems, Division of NCI Group, Inc.**; Houston TX. Tel: (877)713-6224; Email: info@mbc.com; Web: www.mbc.com.
- B. Morin / A Kingspan Group Company; www.kingspan.com/us/en-us/product-groups/metal-roof-wall-systems; 1975 Eidson Drive, Florida, 32724; Phone: 860.584.0900 or 800.640.9501
- C. PAC-CLAD; www.pac-clad.com: 1005 Tonne Road, Elk Grove Village, IL 60007; Ph: 800-PAC-CLAD
- D. 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 PERFORMANCE REQUIREMENTS

- A. General: Provide metal panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.
- B. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated, as determined by ASTM E1592:
 - 1. Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on drawings.
 - a. Wind Negative Pressure: Certify capacity of metal panels by actual testing of proposed assembly.
 - 2. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of 1/120 of the span with no evidence of failure.
 - 3. Seismic Performance: Comply with ASCE 7 Sections 9, "Earthquake Loads."
- C. Wall Panel Air Infiltration, ASTM E283:
 - 1. No air infiltration at static-air-pressure difference of 1.57 lbf/sq. ft. (75 Pa).
- D. Wall Panel Water Penetration Static Pressure, ASTM E331: No uncontrolled water penetration at a static pressure of 6.24 lbf/sq. ft. (300 Pa).
- E. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.

2.3 FORMED METAL WALL PANELS [EXTERIOR] VERTICAL APPLICATION.

- A. Flush-Profile, Concealed Fastener Metal Wall Panels: Structural metal panels consisting of formed metal sheet with vertical panel edges and flat pan with flush joints between panels, field assembled with nested interlocking edges, and attached to supports using concealed fasteners.
 - 1. Basis of Design: **MBCI, FW-120-0 Panel. (No Beads)**
 - 2. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792/A792M, structural quality, Grade 50, Coating Class AZ50 (Grade 340, Coating Class AZM150), prepainted by the coil-coating process per ASTM A755/A755M.
 - a. Nominal Thickness: 24 gauge (Standard) coated thickness, with smooth surface.
 - i. Exterior Finish: Fluoropolymer two-coat system.
 - ii. Color: As selected by Architect from manufacturer's standard colors after Bid Date.
 - 3. Panel Width: 12 inches (305 mm).
 - 4. Panel Thickness: 1-1/2 inch (38 mm).

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide complete metal panel assemblies incorporating trim, copings, fasciae, gutters and downspouts, and miscellaneous flashings. Provide required fasteners, closure strips, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Match material, thickness, and finish of metal panels.
- C. Panel Fasteners: Self-tapping screws and other acceptable fasteners recommended by metal panel manufacturer. Where exposed fasteners cannot be avoided, supply corrosion-resistant fasteners with heads matching color of metal panels by means of factory-applied coating, with weathertight resilient washers.
- D. Panel Sealants:

1. Factory-Applied Seam Sealant: Manufacturer's standard hot-melt type.
2. Concealed Joint Sealant: Non-curing butyl, AAMA 809.2.
3. Elastomeric Joint Sealant: Urethane sealant, single-component, ASTM C920 Type S, Grade NS, Class 25, Use NT, A, M, G, O.
4. Foam Tape: Manufacturer's standard self-adhering type.

2.5 FABRICATION

- A. General: Provide factory fabricated and finished metal panels, trim, and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings.

2.6 FINISHES

- A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- B. Fluoropolymer Two-Coat System: 0.2 – 0.3 mil primer with 0.7 - 0.8 mil 70 percent PVDF fluoropolymer color coat, AAMA 621, meeting solar reflectance index requirements.
 1. Basis of Design: **MBCI, Signature 300.**

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine metal panel system substrate with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panels.
 1. Inspect framing that will support insulated metal panels to determine if support components are installed as indicated on approved shop drawings and are within tolerances acceptable to metal panel manufacturer and installer. Confirm presence of acceptable framing members at recommended spacing to match installation requirements of metal panels.
- B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal panel installation.

3.1 METAL PANEL INSTALLATION

- A. Concealed-Fastener Formed Metal Panels: Install metal panel system in accordance with manufacturer's written instructions, approved shop drawings, project drawings, and referenced publications. Install metal panels in orientation, sizes, and locations indicated. Anchor panels and other components securely in place. Provide for thermal and structural movement.
- B. Fasten metal panels to supports with fasteners at each location indicated on approved shop drawings, at spacing and with fasteners recommended by manufacturer. Fasten panel to support structure through leading flange. Snap-fit back flange of subsequent panel into secured flange of previous panel. Where indicated, fasten panels together through flush-fitted panel sides.
 1. Cut panels in field where required using manufacturer's recommended methods.
 2. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by metal panel manufacturer.
- C. Attach panel flashing trim pieces to supports using recommended fasteners and joint sealers.
- D. Joint Sealers: Install liquid sealants where indicated and where required for weatherproof performance of metal panel assemblies.
 1. Seal panel base assembly, openings, panel head joints, and perimeter joints using joint sealers indicated in manufacturer's instructions.

2. Seal perimeter joints between window and door openings and adjacent panels using elastomeric joint sealer.
3. Prepare joints and apply sealants per requirements of Division 07 Section "[Joint Sealants](#)."

3.2 ACCESSORY INSTALLATION

- A. General: Install metal panel accessories with positive anchorage to building and weather tight mounting; provide for thermal expansion. Coordinate installation with flashings and other components.
 1. Install components required for a complete metal panel assembly, including trim, copings, flashings, sealants, closure strips, and similar items.
 2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
 3. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.

3.3 CLEANING AND PROTECTION

- A. Clean finished surfaces as recommended by metal panel manufacturer.
- B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Architect.

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 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

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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. Versico Roofing - Versiweld with Octguard XT (Basis of Design)
 - b. GAF – Everguard
 - 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. Versico Roofing - VersiFlex Roofing (Basis of Design)
 - b. DuroLast Roofing
 - c. Johns Manville, Inc.
 - d. Sarnafil Roof Membrane Roofing
 - e. Fibertite Roofing
 - f. Carlisle Syntec Systems
 - g. GAF Commercial
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.**

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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

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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.

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. Metal Counter Flashing and Base Flashing.
 - 2. Exposed Metal Trim Units
 - 3. Eave Strip/Drip Edge
 - 4. Fascia
 - 5. Soffit
 - 6. Gutters
 - 7. Downspouts
 - 8. Elastic flashing.
 - 9. Elastic roof/wall expansion joint systems.
- 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:

1. Non-Perforated Aluminum Soffit
 - a. Envoy V-Groove by PlyGem/Mastic
 - b. Alupalure 2000 finish
 - c. .019" thick
 - d. 12" exposure or as indicated on drawings.
2. Perforated Aluminum Soffit for ventilation
 - a. Envoy V-Groove by PlyGem/Mastic
 - b. 15 sq. in/Lin. ft..
 - c. Alupalure 2000 finish
 - d. .019" thick
 - e. 12" exposure or as indicated on drawings.

2.5 SHEET FLASHING

- A. Provide EPDM synthetic rubber sheet except where metal is indicated.
- B. Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 1. Nervastral Seal Pruf HD-20
 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.
- C. Materials:
 1. Elastic Sheet Flashing/Membrane: Manufacturer's standard flexible, elastic, black, nonreinforced, flashing sheet of 50 - 65 mils thickness.

2.6 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 08100 - STEEL DOOR 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 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: Submit manufacturer's specifications for fabrication and installation, including data substantiating that products comply with requirements.
- C. Shop Drawings: Submit for fabrication and installation of steel door frames. Include details of each frame type, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
- D. Frame Schedule: Submit schedule of 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 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.

1.4 QUALITY ASSURANCE

- A. Provide frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished frames.
- B. Inspect 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 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 frames become wet, remove cartons immediately. Provide minimum 1/4-inch (6-mm) spaces between stacked frames to promote air circulation.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- 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 Frames/Allegion
 - 4. Steelcraft - Allegion
 - 5. Amweld Building Products Div.
 - 6. Ceco Corp.
 - 7. Curries Mfg. Inc.
 - 8. Fenestra.
 - 9. Bymoco
 - 10. Mesker

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) and ASTM A 568.
- B. Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366 (ASTM A 366M), commercial quality, and ASTM A 568.
- C. Supports and Anchors: Fabricated from not less than 18 gauge galvanized steel sheet.
- D. 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.
- E. Shop Applied Paint:
 - 1. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints.

2.3 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."

2.4 FABRICATION

- A. Fabricate steel door 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. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- B. Galvannealed Steel Frames: For the following locations, fabricate door frames from galvannealed steel sheet according to SDI 112.
 - 1. At exterior locations.
 - 2. Where indicated.
- C. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- D. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier.
- E. Comply with applicable requirements of 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.
- F. Reinforce doors frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- G. 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."

2.5 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.

2.6 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.

2.7 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 door 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. Install foot brace at bottom of all metal frames until installation of door. 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. Metal frames at all interior wall conditions shall be inset ¼" from edge of wall to allow for caulk bead, see detail on drawings.
 - 3. In plaster or masonry walls constructed with antifreeze additives, protect inside (concealed) faces of door frames using fibered asphalt emulsion coating. Apply approximately 1/8" thick over shop primer and allow to thoroughly dry before handling.
 - 4. 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.
 - 5. 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.
 - 6. Install fire-rated frames according to NFPA 80.

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.
 - 3. Louvers for 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 – FIBERGLASS REINFORCED PLASTIC (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 in this section.

1.2 DESCRIPTION OF WORK

- A. The extent of each type of door is shown on the drawings and schedules.
- B. The following types of doors are required:
 - 1. Fiberglass Reinforced Plastic (FRP) Doors.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. Finish Hardware, Section 08700
- B. Joint Sealers, Section 07900.
- C. Aluminum Storefront, Section 08410.
- D. Glazing, Section 08800.

1.4 QUALITY ASSURANCE

- A. Referenced Standards
 - 1. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
 - 2. ASTM E 84 - Standard Test Method for a Surface Burning Characteristics of Building Materials.
- B. Laminate Properties:
 - 1. ASTM D 882 Tensile Strength
 - 2. ASTM D 790 Flexural Strength
 - 3. ASTM D 2583 Barcol Hardness
 - 4. ASTM D 256 Impact Resistance
 - 5. ASTM D 792 Density/Specific Gravity Of Laminate
 - 6. ASTM D 1761 Mechanical Fasteners
- C. Core Properties:
 - 1. ASTM C 177 Thermal Properties
 - 2. ASTM D 1622 Density/Specific Gravity
 - 3. ASTM E 84 Surface Burning Characteristics
 - 4. WDMA TM-10 and TM-5 Firestop ASTM E 152 U.L. 10(b)
- D. Qualifications:
 - 1. Manufacturer Qualifications: A company specialized in the manufacture of fiberglass reinforced plastic (FRP) doors and frames as specified herein with a minimum of 25 years documented experience and with a record of successful in-service performance for the applications as required for this project.

- E. Installer Qualifications: An experienced installer who has completed fiberglass door and frame installations similar in material, design, and extent to those indicated and whose work has resulted in construction with a record of successful in-service performance.
- F. Source Limitations: Obtain fiberglass reinforced plastic doors and frames through one source fabricated from a single manufacturer, including fire rated fiberglass frames.
- G. Source Limitations: Hardware and accessories for all FRP doors as specified in Section 08710 should be provided and installed by the fiberglass door and frame manufacturer.
- H. Source Limitations: Glass for windows in doors shall be furnished and installed by door and frame manufacturer in accordance with related section, Division 8, Glazing.
- I. Field Measurement: Field verify all information prior to fabrication and furnishing of materials. Furnish and install materials omitted due to lack of verification at no additional cost to Owner.
- J. Regulation and Codes: Comply with the current edition in force at the project location of all local, state and federal codes and regulations, including the Americans with Disabilities Act of 1992.

1.5 SUBMITTALS

- A. Product Technical Data Including:
 - 1. Acknowledgment that products submitted meet requirements of standards referenced.
 - a. Manufacturer shall provide certificate of compliance with current local and federal regulations as it applies to the manufacturing process.
 - 2. Manufacturer's installation instructions.
 - a. Schedule of doors and frames indicating the specific reference numbers as used on drawings, door type, frame type, size, handing and applicable hardware.
 - 3. Details of core and edge construction. Include factory-construction specifications.
 - 4. Certification of manufacturer's qualifications.
- B. Submittals:
 - 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.
- C. Samples:
 - 1. Provide one 21 x 18 inch completely assembled (hinged) door and frame corner section, with faces and edges representing typical color and finish. One edge should be exposed for view of interior door and frame composition. Sample should include 6 inch lite opening as well as standard cutouts for hinges and strike plates.
- D. Operation and Maintenance Manuals:
 - 1. Include recommended methods and frequency for maintaining optimum condition of fiberglass doors and frames under anticipated traffic and use conditions.
 - 2. Include one set of final as built drawings with the same requirements as mentioned in Section above.
 - 3. Include certificate of warranty for door and frame listing specific door registration numbers.

4. Include hardware data sheets and hardware manufacturer's warranties.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Each door and frame should 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 should contain all fasteners necessary for installation as well as complete installation instructions.
- B. Doors should be stored in the original container out of inclement weather for protection against the elements.
- C. Handle doors pursuant to the manufacturer's recommendations as posted on outside of crate.

1.7 WARRANTY

- A. Warranty all fiberglass doors and frames for a period of 25 years against failure due to corrosion. Additionally, warranty all fiberglass doors and frames on materials and workmanship for a period of 10 years, including warp, separation or delamination, and expansion of the core.

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; 860 S. Williams Street, Decatur, MI 49045; Ph.: 800.821.6531.
- 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 FRP DOORS

- A. **Model: AF-220 Sandstone Texture Composite Fiberglass Door.**
- B. Doors shall be made of fiberglass reinforced plastic (FRP) using chemically proven resins resistant to contaminants typically found in the environment for which these specifications are written. Doors shall be 1 3/4 inch thick and of flush construction, having no seams or cracks. All doors up to 4'0 x 8'0 shall have equal diagonal measurements with a maximum tolerance of +/- 1/32 inch.
- C. Door Plates shall be 1/8 inch thick, molded in one continuous piece, starting with a 25 mil gelcoat of the color specified, integrally molded with at least two layers of 1.5 ounce per square foot fiberglass mat and one layer of 16 ounce per square yard unidirectional roving. This will yield a plate weight of 0.97 lbs per square foot at a ratio of 30/70 glass to resin.
- D. Stiles and Rails shall be constructed starting from the outside toward the inside, of a 25 mil gel coat of the color specified followed by a matrix of at least three layers of 1.5 ounce per square foot of fiberglass mat. The stile and rail shall be molded in one continuous piece to a U-shaped configuration and to the exact dimensions of the door. In this manner there will be no miter joints or disparate materials used to form the once-piece stile and rail.
- E. Core material shall be 2 psf expanded polyurethane foam, which completely fills all voids between the door plates.
- F. Internal Reinforcement shall be firestop of sufficient amount to adequately support required hardware and function of same.
- G. Finish of door and frame shall be identical in color and texture. At time of manufacture, 25 mil of resin-rich gelcoat must be integrally molded into both the door and frame. Secondary painting to achieve color is not acceptable.
- H. Window openings shall be provided for at time of manufacture and shall be completely sealed so that the interior of the door is not exposed to the environment. Fiberglass retainers which hold the

glazing in place shall be resin transfer molded with a profile that drains away from glazing. The retainers must match the color, texture and finish of the door plates. Glass shall be furnished and installed by door and frame manufacturer.

- I. Louver openings shall be sealed in the same manner as the window openings. Louvers are to be solid fiberglass inverted "V" vanes and shall match the color, texture and finish of the door plates.
- J. Transoms shall be identical to the doors in construction, materials, thickness and reinforcement.

2.3 HARDWARE

- A. Refer to Section 08700, Finish Hardware.
- B. Due to the special nature of the material in this section, all related hardware as specified must be furnished and installed by the door and frame manufacturer.

PART 3 – EXECUTION

3.1 INSTALLATION CONDITIONS

- A. Verification of Conditions
- B. Openings are correctly prepared to receive doors and frames.
- C. Openings are correct size and depth in accordance with shop drawings or submittals.
- D. Installer's Examination
- E. Have the installer examine conditions under which construction activities of this section are to be performed and submit a written report if conditions are unacceptable.
- F. Transmit two copies of the installer's report to the architect within 24 hours of receipt.
- G. Beginning construction activities of this section before unacceptable conditions have been corrected is prohibited.

3.2 INSTALLATION

- A. Install door-opening assemblies in accordance with shop drawings and manufacturer's printed installation instructions, using installation methods and materials specified in installation instructions.
- B. Field alteration of doors or frames to accommodate field conditions is strictly prohibited.
- C. Site tolerances: Maintain plumb and level tolerance specified in manufacturer's printed installation instructions.
- D. Fire labeled doors and frames must be installed in strict accordance with manufacturer's instructions and the latest revision of NFPA 80.

3.3 ADJUSTING

- A. Adjust doors in accordance with 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 instructions.

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 08305 - CEILING ACCESS 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. Ceiling Access Doors as indicated on drawings.
 - 1. Access Doors.

1.3 QUALITY ASSURANCE

- A. Furnish each access door as a complete unit produced by one manufacturer, including hardware, accessories, mounting and installation components.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications for fabrication and installation, including data substantiating that products comply with requirements.
- B. Shop Drawings: Submit for fabrication and installation of ceiling access doors and frames. Include details of each frame type, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver metal work cartoned or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.
- B. Inspect metal work upon delivery for damage. Minor damages may be repaired provided finish items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store access doors and frames at building site under cover, store on floors in manner that will prevent rust and damage. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately.

1.6 WARRANTY

- A. Manufacturer shall warrant that the Access Doors ("Product ") are free from manufacturing defects at the time of sale. Manufacturer further warrants the Product will not prematurely deteriorate because of weathering for a period of one (1) year from date of sale.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Milcor | www.milcorinc.com | 5030 Corporate Exchange Blvd. SE Grand Rapids, MI 49512 | Ph.:(800) 624-8642 | Email: info@milcorinc.com.
 - 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.

2.2 ACCESS DOORS

A. FLUSH ACCESS DOOR [WOOD TRUSSES]

1. Ordering Sequence: **Model Number 3202033**, Series: (**M**)*prime painted*, Size: Width (**22 inch**) x Length (**36 inch**). Length denotes hinge side. The access door shall be single leaf. The door shall be pre-assembled from the manufacturer.
2. Materials: **Series M**
 - a. Door: 16 ga. cold rolled steel.
 - b. Frame: 16 ga. cold rolled steel. Frame to be provided with pre-formed mounting holes 3/16 " diameter at 4" spacing. Inner frame included to allow latching.
 - c. Hinge: Concealed spring hinges open to 175° for complete access without allowing the door to impact the wall. Quantity varies per door panel size. Extracting pin from hinge leaf attached to panel permits panel removal.
 - d. Latch: Screwdriver operated cam latch. Quantity varies per door panel size.
 - e. Finish: Powder coat - White.
3. Options: **Series M**
 - a. Latch: Cylinder lock(replaces one cam latch) furnished with two keys. Additional custom options available upon request.

2.3 FIRE RATED ACCESS DOOR

A. UNIVERSAL FIRE RATED ACCESS DOOR

1. Ordering Sequence: **Model Number 3218027**, Series: (**UFR**), Size: Width (22) x Length (36). Length denotes hinge side. The access door shall be single leaf. The door shall be pre-assembled from the manufacturer.
2. Materials:
 - a. Door: 20 ga. cold rolled steel sandwich panel with 2" mineral fiber insulation.
 - b. Frame: 16 ga. 4-piece cold rolled steel with masonry anchors.
 - c. Hinge 18 ga. continuous piano hinge with stainless steel pin.
 - d. Closer: Coil spring self-closing.
 - e. Latch: Self-latching paddle latch and locking system with key operated cylinder lock furnished with two keys and interior release mechanism; (1) per door for sizes below 36"; (2) per door for sizes 36" - 48".
 - f. Finish: Powder coat - White.
3. Rating:
 - a. Rating
 - b. Rating is maintained for a two hour wall.
 - c. Carries UL and CUL 1½ -hour, Class B fire rating.
 - d. Warnock Hersey Label for three-hour noncombustible ceiling systems.
 - e. UL Certified: 250° F temperature rise protection for cold rolled steel; 450° F temperature rise protection for stainless steel.

2.4 RECESSED ACCESS DOOR FOR ACOUSTICAL TILE CEILING

A. RECESSED STEEL

1. Ordering Sequence: **Model Number 3205034**, Series: (**AT**), Size: Width (24) x Length (36). Length denotes hinge side. The access door shall be single leaf. The door shall be pre-assembled from the manufacturer.

2. Materials:
 - a. Door: 18 ga. cold rolled steel, recessed 1" to accept acoustical tile.
 - b. Frame: 18 ga. cold roled steel outer frame.16 ga. cold rolled steel inner frame. Frame provided with 1/4" x 1/2" slots at corners for framing attachment.
 - c. Hinge: Continuous piano hinge with stainless steel pin..
 - d. Latch: Cylinder lock (replaces one cam latch) furnished with two keys. Additional custom options available on request Finish: Powder coat - White.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify by comparing packing slip and box label that product is per specification.
- B. Verify that the substrate is dry, clean, and free of foreign matter and in compliance with requirements for installation tolerances and other conditions affecting performance. Report and correct any defects prior to any installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Refer to manufacturer's product literature for surface preparation requirements. Surfaces should be structurally sound, free of voids, spalls, loose aggregate and sharp ridges. Remove dust, dirt, debris or any other foreign materials.

3.3 INSTALLATION

- A. Verify that access door installation will not disrupt other trades.
- B. Install access doors in strict accordance with manufacturer's instructions and approved submittals.
 1. Test units for proper function and adjust until proper operation is achieved.
 2. Repair finishes damaged during installation.
 3. Restore finishes so no evidence remains of corrective work.

3.4 ADJUSTING AND CLEANING

- A. Product requires no spill or leak containment.
- B. Remove and replace access doors with damage, bowing, or warping that interferes with the installation or functionality of product. Dispose of damaged material in accordance with all governmental regulations.
- C. Clean exposed surfaces using methods acceptable to the manufacturer which will not damage finish.
- D. Protect completed work from subsequent construction activities as recommended by manufacturer.

END OF SECTION

SECTION 08520 - ALUMINUM IMPACT WINDOWS – SINGLE HUNG

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 aluminum window units including window column covers, panning trim, as shown on drawings.

1.3 QUALITY ASSURANCE

- A. Standards: Except as otherwise indicated requirements for aluminum windows, terminology and standards of performance, and fabrication workmanship are those specified and recommended in ANSI/AAMA 506 and applicable general recommendations published by AAMA and AA. Where more stringent requirements are shown, manufacturer shall provide proof of compliance as required by the architect.
- B. Performance and Testing:
- C. General: Except as otherwise indicated, comply with air infiltration tests, water resistance tests, and applicable load tests specified in ANSI/AAMA 506 for type and classification of window units required in each case.
- D. Prior Approval: Window manufacturers other than those specified requesting approval shall submit samples and test data ten days prior to bid opening for approval. Architect will list those approved manufacturers by addendum. No verbal approvals will be issued.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, recommendations, and standard details for aluminum window units, including certified test laboratory reports as necessary to show compliance with requirements.
- B. Shop Drawings: Submit shop drawings, including wall elevations at 1/4" scale, typical unit elevations at 3/4" scale and full size detail sections of every typical composite member. Show anchors, hardware, operators and other components not included in manufacturer's standard data. Include glazing details. **Engineered Stamped Calculations are required by an engineer with a State of Alabama Stamp.**
 - 1. Architect reserves right to require additional samples which will show fabrication techniques, workmanship of component parts, and design of hardware and other exposed auxiliary items.

1.5 SPECIAL PROJECT WARRANTY

- A. 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 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 MANUFACTURES – LARGE MISSILE IMPACT WINDOWS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Peerless - Series 4130-R Single Hung
 - 2. Traco - Series TR-91001 Single Hung
 - 3. Winco - Series 4110 Single Hung
- 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. GENERAL: All aluminum prime windows shall be single hung type and shall conform to the Architectural Aluminum Manufacturer's Association specification requirements for AW-40.
- B. All windows shall be of the type and size shown on the drawings.
- C. Aluminum Extrusions: Alloy and temper recommended by window manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000 psi ultimate tensile strength and not less than 0.062" thickness at any location for main frame and sash members. Comply with ASTM B 221.
- D. Fasteners: Aluminum, non-magnetic stainless steel, or other materials warranted by manufacturer to be noncorrosive and compatible with aluminum window members, trim, hardware, anchors and other components of window units.
 - 1. Reinforcement: Where fasteners screw-anchor into aluminum less than 0.125" thick, reinforce interior with aluminum or non-magnetic stainless steel to receive screw threads, or provide standard non-corrosive pressed in splined grommet nuts.
 - 2. Do not use exposed fasteners except where unavoidable for application of hardware. Match finish of adjoining metal.
 - 3. Provide Phillips flat-head machine screws for exposed fasteners.
- E. Anchors, Clips and Window Accessories: Depending on strength and corrosion-inhibiting requirements, fabricate units of aluminum, non-magnetic stainless steel, or hot-dip zinc coated steel or iron complying with ASTM A 386.
- F. Sealant: Unless otherwise indicated for sealants required within fabricated window units, provide type recommended by window manufacturer for joint size and movement, to remain permanently elastic, non-shrinking and non-migrating. Comply with Division 7 sections for installation of sealants.

2.3 MATERIALS - LARGE MISSILE IMPACT WINDOWS

- A. MATERIALS: All sections of frame and sash members shall be of commercial quality extruded 6063-T5 aluminum alloy. Frame shall have a minimum depth of 3-1/4" with a minimum wall thickness of not less than .062". Sill members and panning trim minimum thickness shall not be less than .078". All horizontal ventilator rails shall be of tubular construction and shall have a minimum glazing depth of 7/8". Panning trim, where required, shall be of extruded aluminum of not less than .078" thick. Window to have individual mulls exposed at exterior.
- B. CONSTRUCTION: Frame and sash member joints shall be neatly and securely fastened by means of 2 screws per corner which fasten into screw bosses extruded integrally in the section. Frame corners shall be sealed with an approved sealant in order to provide a permanently leakproof joint. Sash shall have nylon guides to prevent metal to metal contact between sash and frame members.

- C. **HARDWARE:** Each window shall have a set of heavy duty emergency sill latches. Latch shall be secure lock when windows are in the closed and locked position. Bottom sash shall have a pair of ½” heavy block & tackle balances, easily replaceable and adjustable.
- D. **WEATHERSTRIPPING:** The sash shall have integral grooves containing a silicone treated wool pile with fin seal vinyl barrier. Each sash shall be weather-stripped around the perimeter and double weather-stripped at the jambs.
- E. **GLASS AND GLAZING:** Windows shall be factory glazed with 1” thick insulating glass with exterior pane to be 1/4” Gray Cardinal 366 Lo-E tempered, ½” airspace, and interior pane to be 1/4” clear laminated with .090 inner layer “Impact Resistance Glass for Large Missiles”, as per ASTM E 2190-02 as pass/fail.
- F. **MUNTINS:** If detailed on the window schedule and building elevations shall be between the glass. Finish on muntins shall match window finish.
- G. **FINISH:** Windows shall receive a 2605 Kynar Paint Finish.
 - 1. Color to be selected from manufactures standard colors AFTER BID DATE.
- H. **BREAK METAL SILL FLASHING:** If detailed, at the window sills shall have end dams and be provided by the window manufacturer. Finish to match windows.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer’s specifications and recommendations for installation of window units, hardware, operators, and other components of work.
- B. Set units plumb, level and true to line, without warp or rack of frames or sash. Anchor securely in place. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action.
- C. Set sill members and other members in bed of compound as shown, or with joint fillers or gaskets as shown, to provide weathertight construction. Refer to Division 7 sealant sections for compounds, fillers and gaskets to be installed with window units. Coordinate installation with wall flashings and other components of work.

3.2 ADJUST AND CLEAN

- A. Adjust operating sash and hardware to provide tight fit at contact points and at weather-stripping, for smooth operation and weathertight closure.
- B. Clean aluminum surfaces promptly after installation of windows, exercising care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt and other substances. Lubricate hardware and moving parts.
- C. Initiate and maintain all protection and other precautions required to ensure that window units will be without damage or deterioration (other than normal weathering) at time of acceptance.

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

1.4 QUALITY ASSURANCE

- 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.

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.
- B. Product data including 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.

1.6 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. 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. Mullins Building Products; Montgomery, AL
 - c. Rayford & Associates, Inc.; Mobile, AL
- E. 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.

1.7 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 number 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.

1.8 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. Bommer
- 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.

2.4 ELECTRONIC HARDWARE

A. MANUFACTURERES

1. Basis of design is Stanley Wi-Q Technology
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. Meeting 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, 14D Design, 630 AM
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.
 - d. Trim to be 14D Design with an antimicrobial coating ('AM')

2.6 EXIT DEVICES

A. MANUFACTURERES

1. Dormakaba 9000 Series x YR Design
2. Stanley/Precision Apex 2000 Series x 4900D Design
3. Hagar Companies 4501 Series x 45 ARC 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.
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 14D design with an antimicrobial coating (AM).

2.7 CLOSERS

A. MANUFACTURERES

1. Dorma - 8900 Series
2. 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. Rockwood Mfg
3. Burns
4. 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 | 628 Clear Anodized Aluminum/Barrel Hinges 652 |
| 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 SCHEDULE

Manufacturer List

| <u>Code</u> | <u>Name</u> |
|-------------|------------------------|
| AB | ABH Manufacturing Inc. |
| BE | Best Access Systems |
| NA | National Guard |
| PR | Precision |
| BE | Best Door Closers |
| SP | Special Lite |
| ST | Stanley |
| TR | Trimco |
| HE | H.E.S. |
| SE | Securitron |

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) |
| B4E | BEVELED 4 EDGES - KICK PLATES |
| CSK | COUNTER SINKING OF KICK and MOP PLATES |
| LBR | LESS BOTTOM ROD |
| MCS | Mullion Cap Spacer (600 Finish) |
| VIN | Visual Indicator |
| 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) |
| 2 3/4"BS | 2 3/4" BACKSET |

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 |
| BLK | Black |
| US26D | Chromium Plated, Dull |
| US32D | Stainless Steel, Dull |

Hardware Sets

SET #E01

Exterior Doors: 106, 201B.

| | | | | |
|---|-------------------|--------------------------------|-----|----|
| 1 | Continuous Hinge | 661HD UL 85" | AL | ST |
| 1 | Exit Device | 2103 36" CA-03 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 | Flush Pull | SL86 | C | SP |
| 1 | Door Closer | HD8016 DST | 689 | BE |
| 1 | Door Sweep | 101 VA x 36" | | NA |
| 1 | Threshold | 896 N x 36" | | NA |

NOTE: Flush Pull supplied, and Factory installed by Special-Lite.

NOTE: Weather-seals supplied by Aluminum Storefront Frame Supplier.

SET #E02

Exterior Doors: 201A, 209.

| | | | | |
|---|-------------------|--------------------------------|-----|----|
| 1 | Continuous Hinge | 661HD UL 85" | AL | ST |
| 1 | Exit Device | 2103 48" CA-03 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 | Flush Pull | SL86 | C | SP |
| 1 | Door Closer | HD8016 DST | 689 | BE |
| 1 | Door Sweep | 101 VA x 48" | | NA |
| 1 | Threshold | 896 N x 48" | | NA |

NOTE: Flush Pull supplied, and Factory installed by Special-Lite.

NOTE: Weather-seals supplied by Aluminum Storefront Frame Supplier.

SET #E03

Exterior Doors: 103, 204A.

| | | | | |
|---|-------------------|----------------|-----|----|
| 1 | Continuous Hinge | 661HD UL 85" | AL | ST |
| 1 | Mortise Lockset | 45H-7TD14H STD | 630 | BE |
| 1 | Construction Core | 1C-7 Green | GN | BE |
| 1 | Door Closer | HD8016 DST | 689 | BE |
| 1 | Door Sweep | 101 VA x 36" | | NA |
| 1 | Threshold | 896 N x 36" | | NA |

NOTE: Weather-seals supplied by Aluminum Storefront Frame Supplier.

SET #E04

Exterior Doors: 101, 102.

| | | | | |
|---|-------------------|-------------------------|-----|----|
| 1 | Continuous Hinge | 661HD UL 85" | AL | ST |
| 1 | Mortise Deadlock | 48H-7R STD | 626 | BE |
| 1 | Construction Core | 1C-7 Green | GN | BE |
| 1 | Flush Pull | SL86 | C | SP |
| 1 | Push Plate | 1001-11 | 630 | TR |
| 1 | Door Closer | HD8016 AF80P | 689 | BE |
| 1 | Floor Stop | 1209 | BLK | TR |
| 1 | Kick Plate | K0050 10" x 34" B4E CSK | 630 | TR |
| 1 | Mop Plate | K0050 6" x 35" B4E CSK | 630 | TR |
| 1 | Threshold | 425 x 36" | | NA |

NOTE: Flush Pull supplied, and Factory installed by Special-Lite.

NOTE: Weather-seals supplied by Aluminum Storefront Frame Supplier.

SET #01

Interior Door 202.

| | | | | |
|---|-------------------|----------------------|------|----|
| 3 | Hinges | FBB168 4 1/2 X 4 1/2 | 652 | ST |
| 1 | Office Lockset | 9K3-7AB14D S3 STD | 626 | BE |
| 1 | Construction Core | 1C-7 Green | GN | BE |
| 1 | Wall Bumper | 1270CV | 626 | TR |
| 3 | Silencers | 1229A | Grey | TR |

SET #02

Interior Doors: 104, 105.

| | | | |
|---------------------|----------------------|------|----|
| 3 Hinges | FBB168 4 1/2 X 4 1/2 | 652 | ST |
| 1 Classroom Lockset | 9K3-7R14D S3 STD | 626 | BE |
| 1 Construction Core | 1C-7 Green | GN | BE |
| 1 Overhead Stop | 9012A | 630 | AB |
| 3 Silencers | 1229A | Grey | TR |

SET #03

Interior Door 203.

| | | | |
|---------------------|----------------------|------|----|
| 3 Hinges | FBB168 4 1/2 X 4 1/2 | 652 | ST |
| 1 Office Lockset | 9K3-7AB14D S3 STD | 626 | BE |
| 1 Construction Core | 1C-7 Green | GN | BE |
| 1 Overhead Stop | 9012A | 630 | AB |
| 3 Silencers | 1229A | Grey | TR |

SET #04

Interior Door 208.

| | | | |
|---------------|-------------------------|------|----|
| 3 Hinges | FBB168 4 1/2 X 4 1/2 | 652 | ST |
| 1 Passage Set | 9K3-0N14D S3 | 626 | BE |
| 1 Door Closer | HD8016 AF80P | 689 | BE |
| 1 Wall Bumper | 1270CV | 626 | TR |
| 1 Kick Plate | K0050 10" x 34" B4E CSK | 630 | TR |
| 3 Silencers | 1229A | Grey | TR |

SET #05

Interior Door 207.

| | | | |
|---------------|-------------------------|------|----|
| 3 Hinges | FBB168 4 1/2 X 4 1/2 | 652 | ST |
| 1 Passage Set | 9K3-0N14D S3 | 626 | BE |
| 1 Door Closer | HD8016 DST | 689 | BE |
| 1 Kick Plate | K0050 10" x 46" B4E CSK | 630 | TR |
| 3 Silencers | 1229A | Grey | TR |

NOTES:

- A) INSTALL ALL DOOR CLOSERS AWAY FROM CORRIDORS AND PUBLIC VIEW.
- B) ALL EXTERIOR AND 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 interior borrowed lites
 - 4. Glass for storefront framing.
 - 5. 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

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.

- 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 1 (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 1 (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.

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- 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 MONOLITHIC GLASS SCHEDULE

- A. Glass Type [GL-1]: Clear fully tempered float glass.
 - 1. Minimum Thickness: 6 mm.
 - 2. Visible Light Transmittance: 88 percent minimum.
 - 3. Solar Heat Gain Coefficient: .84 maximum.
 - 4. Safety glazing required.
- B. Glass Type [GL-2]: Tinted fully tempered float glass.
 - 1. Basis-of-Design Product: AGC Glass Company North America; Solarshield.

2. Tint Color: Solarshield Pure Grey
3. Minimum Thickness: 6 mm.
4. Visible Light Transmittance: 45 percent minimum.
5. Solar Heat Gain Coefficient: .60 maximum.
6. Safety glazing required.

3.7 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).
 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.

3.8 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. Air Barrier
 3. 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

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 "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.
 - 3. Thickness: 5/8" unless otherwise indicated.
 - 4. Edges: Manufacturer's standard.
- B. Air Barrier: (Where indicated and/or identified on the drawings)
 - 1. At the bottom of the wood trusses the Contractor shall furnish and install the following materials:
 - a. Gypsum board having a thickness of not less than 1/2 inch (12 mm). Seal **all** joints with insulation tape.

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.
 - 9. All gypsum board surfaces at **all Classrooms** shall be finished to **Level 4** in accordance to GA 214.
 - 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

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SECTION 09301 - PORCELAIN TILE

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. Definition: Tile includes ceramic surfacing units made from clay or other ceramic materials.
- B. Extent of tile work is indicated on drawings and schedules.
- C. Types of tile work in this section include the following:
 - 1. Wall Tile.
- D. Portland cement plaster scratch coat on wall surfaces indicated to receive tile is work of this section.
- E. Sealing expansion and other joints in tile work with elastomeric joint sealers is work of this section.

1.3 QUALITY ASSURANCE

- A. Source of Materials: Provide materials obtained from one source for each type and color of tile, grout, and setting materials.
- B. Mock-Up: Contractor shall provide mock-up panels for evaluation of materials, surface preparation techniques and application workmanship.
 - 1. Mock-up panel shall be no less than 4'-0" x 4'-0" panel as follows:
 - a. One (1) panel per room, per surface. (i.e. 1 panel for wall surface and 1 panel for floor surface for each room of different selection).
 - b. Mock-up panels shall be marked identifying room location and product manufacturer, type, style, size and color information.
 - c. Do not proceed with work until materials, workmanship, color, and sheen are approved by Architect.
 - d. Provide additional mock-up panels as required to produce acceptable work.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information and installation instructions for materials required, except bulk materials.
- B. Samples for Selection Purposes: Submit manufacturer's color charts consisting of actual tiles or sections of tile showing full range of colors, textures and patterns available for each type of tile indicated. Include samples of grout and accessories involving color selection.

1.5 PRODUCT HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Prevent damage or contamination to materials by water, freezing, foreign matter or other causes.

1.6 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.

- C. Maintain temperatures at not less than 50 degrees F in tiled areas during installation and for 7 days after completion, unless higher temperatures required by referenced installation standard or manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Porcelain Tile:
 - a. StonePeak (Basis of Design)
 - b. American Olean Tile Co.
 - c. Marazzi
- 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 PRODUCTS, GENERAL

- A. ANSI Standard for Ceramic Tile: Comply with ANSI A137.1 "American National Standard Specifications for Ceramic Tile" for types and grades of tile indicated.
 - 1. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated.
- B. ANSI Standard for Tile Installation Materials: Comply with ANSI standard referenced with installation products and materials indicated.
- C. Colors, Textures and Patterns: For tile and other products requiring selection of colors, surface textures or other appearance characteristics, provide products to match characteristics indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standards.
 - 1. Provide tile trim and accessories which match color and finish of adjoining flat tile.
- D. Mounting: Where factory-mounted tile is required provide back- or edge-mounted tile assemblies as standard with manufacturer unless another mounting method is indicated.
 - 1. Where tile is indicated for installation on exteriors or in wet areas, do not use back or edge-mounted tile assemblies unless tile manufacturer specifies that this type of mounting is suitable for these kinds of use and has been successfully used on other projects.

2.3 TILE PRODUCTS

- A. Provide tile complying with the following requirements:
 - 1. Manufacturer/Series:
 - a. **StonePeak "Simply Modern" Collection.**
 - 2. Type:
 - a. Porcelain
 - 3. Wearing Surface for Floors:
 - a. "stable, firm and slip resistant", (exceeds 0.60 on the ASTM C-1028 test, wet and dry).
 - 4. Nominal Thickness:
 - a. 3/8"
 - 5. Nominal Facial Dimensions as follows:
 - b. Wall Tile
 - 1. **12" x 24" Wall Tile** – "Simply Modern" Series, Unglazed, with 1/4" grout joints.

2. **4" x 12" "Adamas" Series Wall Tile Accent Band – 3 layers high located 6'-0"**
AFF. Glazed, with 1/8" grout joints.

- c. Face: Plain with cushion edges.
- B. Trim Units: Provide tile trim units to match characteristics of adjoining flat tile and to comply with following requirements:
 - 1. Size:
 - a. As indicated, coordinated with sizes and coursing of adjoining flat tile, where applicable.
 - 2. Shapes:
 - a. Selected from manufacturer's standard shapes.
 - 3. External Corners for Portland Cement Mortar Installations:
 - a. Bullnose shape with a radius of not less than 3/4" unless otherwise indicated.
 - 4. Internal Corners:
 - a. Field-buttet square corners, except use internal cove and cap angle pieces designed to member with stretcher shapes.

2.4 SETTING MATERIALS

- A. Portland Cement Mortar Installation Materials: Provide materials to comply with ANSI A108.1 as required for installation method designated, unless otherwise indicated.

2.5 GROUTING MATERIALS – FLOOR & WALL

- A. High Performance Epoxy grout that offers color uniformity, durability and stain resistance with extraordinary ease of use.
 - 1. Laticrete "Spectralock Pro Grout".
 - 2. Color to be selected by architect after the bid date from manufacturer standards
- B. Epoxy grout is to be installed per manufacturer's instructions.

2.6 MISCELLANEOUS MATERIALS

- A. Single-Component Sealants: ASTM C 920, Type S, Grade NS, use NT (for use in joints in non-traffic areas).
- B. Two-Component Sealants: ASTM C 920, Type M, Grade P, Class 25, use T (for use in joints subject to pedestrian traffic).
- C. Tile Cleaner: Product specifically acceptable to manufacturer of tile and grout manufacturer for application indicated and as recommended by National Tile Promotion Federation, 112 North Alfred St., Alexandria, VA 22134 or Ceramic Tile Institute, 700 N. Virgil Ave., Los Angeles, CA 90029.

2.7 TILE BACKING PANELS

- A. Fiber-Cement Backer Board: ASTM C1288, in maximum lengths available to minimize end-to-end butt joints.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation.
 - b. Custom Building Products.
 - c. James Hardie Building Products, Inc.
 - 2. Thickness: 1/2 inch (12.7 mm) unless otherwise indicated on drawings.

- B. Install panels and treat joints in accordance with ANSI A108.11, APA guidelines, and manufacturer's written instructions for type of application indicated

2.8 WATERPROOF MEMBRANE

- A. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; 0.008-inch (0.2-mm) nominal thickness.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Schluter Systems L.P.
 - 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. Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.
 - 1. Allow waterproof membrane to cure and verify by testing that it is watertight before installing tile or setting materials over it.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine surfaces to receive tile work and conditions under which tile will be installed. Do not proceed with tile work until surfaces and conditions comply with requirements indicated in referenced tile installation standard.

3.2 PRE-INSTALLATION CONFERENCE

- A. A pre-installation conference is required before any tiling materials are installed. This conference shall be conducted by a representative of the Architect and attended by the General Contractor and Tile Contractor. Provide at least 72 hours advance notice to participants prior to convening pre-installation conference.
- B. The pre-installation conference is intended to clarify demolition and application requirements for work to be completed before tiling operations can begin. This would include a detailed review of the specifications, plans, finish schedules and approved shop drawings, submittal data, samples and mock-ups. If this pre-installation 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 tiling areas and substantial agreement on all requirements.
- C. The following are to be accomplished during the conference:
 - 1. To review all requirements listed in the specifications and resolve any questions or conflicts that may arise.
 - 2. To establish trade-related job schedules.
 - 3. To establish tiling schedule and work methods that will prevent progress of other trades.
 - 4. Require that all surface preparations and conditions be complete prior to installing tile work.
 - 5. To establish those areas on the job site that will be designated as work and storage areas for tiling operations.
 - 6. To establish acceptable methods of protecting the finished tile surfaces if any trades must travel across or work on, above or around any areas of the finished tile work.

- D. The Architect shall prepare a written report indicating actions taken and decisions made at this pre-installation conference. This report shall be made a part of the project record and copies furnished to the General Contractor and the Owner.

3.3 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standard: Comply with applicable parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for the Installation of Ceramic Tile".
- B. TCA Installation Guidelines: TCA "Handbook for Ceramic Tile Installation"; comply with TCA installation methods indicated or, if not otherwise indicated, as applicable to installation conditions shown.
- C. Setting beds:
 - 1. Wall tile: Thinset.
- D. Extend tile work into recesses and under or behind equipment and fixtures, to form a complete covering without interruptions, except as otherwise shown. Terminate work neatly at obstructions, edges and corners without disrupting pattern or joint alignments.
- E. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures and other penetrations so that plates, collars, or covers overlap tile.
- F. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls and trim are same size. Layout tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise shown.
 - 1. For tile mounted in sheets make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.
- G. Lay out tile wainscots to next full tile beyond dimensions indicated.
- H. Expansion Joints: Locate expansion joints and other sealant filled joints, including control, contraction and isolation joints, where indicated, or if not indicated, at spacing and locations recommended in TCA "Handbook for Ceramic Tile Installation", and approved by Architect.
 - 1. Prepare joints and apply sealants to comply with requirements of referenced standards and sealant manufacturer.
- I. Grout tile to comply with referenced installation standards, using grout materials indicated.

3.4 FLOOR INSTALLATION METHODS

- A. Porcelain Tile: Install tile to comply with requirements indicated below for setting bed methods, TCA installation methods related to types of subfloor construction, and grout types:
 - 1. Concrete Subfloors, Interior: TCA F113 with isolation membrane equal to Nobleseal CIS.
- B. Grout:
 - 1. High Performance Epoxy grout is to be installed per manufacturer's instructions.
- C. Stone Thresholds: Install stone thresholds at locations indicated; set in same type of setting bed as abutting field tile unless otherwise indicated.
- D. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood or other flooring which finishes flush with top of tile.

3.5 WALL TILE INSTALLATION METHODS

- A. Install types of tile designated for wall application to comply with requirements indicated below for setting bed methods, TCA installation methods related to subsurface wall conditions, and grout types:

1. Solid Backing, Interior: TCA W221 in wet areas and W213 or W223 25

a. applicable in other areas.

B. Grout:

1. High Performance Epoxy grout is to be installed per manufacturer's instructions.

3.6 CLEANING AND PROTECTION

A. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Unglazed tile shall be cleaned with non-acid solutions only recommended by tile and grout manufacturer's printed instructions, but no sooner than 14 days after installation. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of tile cleaning. Flush surface with clean water after cleaning.

B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile work.

C. Protection: When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage and wear.

D. Prohibit foot and wheel traffic from using tiled floors for at least 7 days after grouting is completed. Before final inspection, remove protective coverings and rinse neutral cleaner from tile 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. Tile Flooring: Furnish not less than one box for each type, color, pattern and size installed.

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

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. Certainteed/Hunter Douglass | 5015 Oakbrook Parkway, Suite 100, Norcross, GA 30093 | Ph: 800.366.4327 | www.certainteed.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 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. Access Doors: Manufactured from galvanized steel with square edges. Coated identical to linear metal panels.
 5. Perimeter Trim
 - a. Wall Channel: Manufactured from 0.025 inch thick aluminum 1 13/16 inch I.D. by 1 7/8 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.

2. Stabilizer Bars: Manufactured from 0.025 inch thick aluminum (4913/16) (3513/16) (2313/16) inch long. Coated with black polyester enamel.

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 interior applications in non-seismic areas install in accordance with ASTM C636 (see 1.03, A 2.).
 2. For interior applications in seismic areas install in accordance with (UBG 25-2 Standard)(IBC Section 1621)(ASTM E 580)(Code Compliance Research Report (CCR) – 0267).
 3. For exterior soffit applications install in accordance with ASTM C636 (see 1.03, A 2.)
- 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 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 & vacuummed.
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 ZXLA 15/16" Acoustical Suspension System

- 1. Double-web design; Intermediate Duty as defined by ASTM C635. Bottom face with 15/16" (24mm) exposed flange with pre-painted aluminum cap; cross tee holes and hanger wire holes at 6 in oc; integral reversible splices, commercial quality pretreated and painted, exposed surfaces prefinished in manufacturer's enhanced corrosion resistant polyester paint finish. Cross tees; roll-formed into double-web design with rectangular bulb; 15/16 (24mm) in exposed flange with pre-painted aluminum cap; Stainless Steel clips clenched to the web. Main tees and cross tees shall be positively locked yet shall be removable without the use of tools.
- 2. Structural Classification: Intermediate Duty.
- 3. Tee Profile: 15/16" (24mm) wide.
- 4. Color: White

B. 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. Armstrong World Industries, Inc.
 - 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. Mannington Commercial, 1844 U.S. Highway 41 S.E. Calhoun, GA 30701; PH: 800.241.2262; www.manningtoncommercial.com.
 - 2. Patcraft; P.O. Box 2128, Dalton, GA 30722; PH: 334.462.9547; www.patcraft.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

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:
 - a. 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%.
- b. 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.
 - c. 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 SUMMARY

- A. Section Includes:
 - 1. Decorative Resinous Flooring System consisting of 100% solids epoxy body coats with decorative quartz broadcasts, finished with a durable urethane topcoat ensuring excellent wear and chemical resistance all producing a seamless floor and integral cove base.
- B. Related Requirements:
 - 1. Section 07900 "Joint Sealants" for sealants.

1.2 ACTION 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, 6 inches square, applied to a rigid backing by Installer for this Project.
- C. Product Schedule: For resinous flooring. Use same designations indicated on Drawings.

1.3 INFORMATIONAL SUBMITTALS

- A. LEED Submittals:
 - 1. Laboratory Test Reports for Credit IEQ 4: For flooring systems, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of flooring systems required for this Project.
 - 1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
- B. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.
- C. 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- square floor area selected by Architect.
 - a. Include 48-inch length of integral cove base with inside corner.
 - 2. Simulate finished lighting conditions for Architect's review of mockups.
 - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 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.

1.7 FIELD 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.
- 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Dur A Flex: Dur A Quartz (Basis-of-Design Product); 95 Goodwin Street, East Hartford, CT, 06108; Ph.: 877.251.5418: www.dur-a-flex.com.
- B. Subject to compliance with requirements or comparable product by one of the following:
 - 1. American Hi-Tech Flooring Company.
 - 2. BASF Construction Chemicals, Inc.; BASF Building Systems.
 - 3. ChemMasters.
 - 4. Crossfield Products Corp.; Dex-O-Tex.
 - 5. DUDICK Inc.
 - 6. Epoxy Systems, Inc.
 - 7. Key Resin Company.
 - 8. NEOGARD; Division of JONES-BLAIR.
 - 9. Nox-Crete Products Group.
 - 10. Pacific Polymers, Inc.
 - 11. POLY-CARB, Inc.
 - 12. Polymerica, Incorporated.
 - 13. PPG Industries, Inc.
 - 14. Sherwin-Williams Company; General Polymers.
 - 15. Stonhard, Inc.
 - 16. Tamms Industries, Inc.; a division of The Euclid Chemical Company.
 - 17. Tnemec Company, Inc.

2.2 MATERIALS

- A. VOC Content of Liquid-Applied Flooring Components: Not more than 100 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

2.3 DECORATIVE RESINOUS FLOORING

- A. Resinous Flooring: Abrasion-, impact- and chemical-resistant, decorative- aggregate-filled, epoxy-resin-based, monolithic floor surfacing designed to produce a seamless floor and integral cove base.
- B. System Characteristics:
 - 1. Color and Pattern: As selected by Architect from manufacturer's full range after Bid Date.

2. Wearing Surface: Manufacturer's standard wearing surface.
 3. Overall System Thickness: 1/4 inch.
- C. Body Coats:
1. Resin: Epoxy.
 2. Formulation Description: 100 percent solids.
 3. Application Method: Self-leveling slurry with broadcast aggregates.
 - a. Thickness of Coats: 1/16 inch.
 - b. Number of Coats: Two.
 4. Aggregates: Manufacturer's standard.
- D. Topcoat: Sealing or finish coats.
1. Resin: Epoxy.
 2. Formulation Description: 100 percent solids.
 3. Type: Clear.
 4. Finish: Matte.
 5. Number of Coats: Two.

2.4 ACCESSORIES

- A. Primer: Type recommended by manufacturer for substrate and body coats indicated.
1. Formulation Description: 100 percent solids.
- B. Reinforcing Membrane: Flexible resin formulation that is recommended by manufacturer for substrate and primer and body coats indicated and that prevents substrate cracks from reflecting through resinous flooring.
1. Formulation Description: 100 percent solids.
 - a. Provide fiberglass scrim embedded in reinforcing membrane.
- C. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application 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, 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. Roughen concrete substrates as follows:
 - a. 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.
 - b. 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 instructions.
 3. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.

- a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application of resinous flooring only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. of slab area in 24 hours.
- b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
- 4. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.
- C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.
- D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
- E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.

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, comply with resinous flooring manufacturer's written instructions.
- B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Apply waterproofing membrane, where indicated, in manufacturer's recommended thickness.
 - 1. Apply waterproofing membrane to integral cove base substrates.
 - 2. Apply waterproofing membrane to flooring substrates
- D. Apply reinforcing membrane to substrate cracks.
- E. 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 topcoating of cove base. Round internal and external corners.
 - 1. Integral Cove Base: 6 inches high.
- F. Apply self-leveling slurry body coats in thickness indicated for flooring system.
 - 1. Broadcast aggregates at rate recommended by manufacturer and, after resin is cured, remove excess aggregates to provide surface texture indicated.
- G. Apply troweled or screeded body coats in thickness indicated for flooring system. Hand or power trowel and grout to fill voids. When cured, remove trowel marks and roughness using method recommended by manufacturer.
- H. Apply grout coat, of type recommended by resinous flooring manufacturer, to fill voids in surface of final body coat and to produce wearing surface indicated.
- I. Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer.

3.3 PROTECTION

- A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by

resinous flooring manufacturer.

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.
- 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 review 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.
 - 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.
 - 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.

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

- 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).
 - b. (*Contractor Option*) Waterbased 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 Pro Industrial Waterbased Alkyd Urethane Enamel, Gloss Finish, B53 Series.

- iv. 3rd Coat: S-W Pro Industrial Waterbased Alkyd Urethane Enamel, Gloss Finish, B53 Series, (1.4 – 1.7 mils dry per coat).
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).
 - 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. EXTERIOR WOODWORK

- 1. Painted Woodwork.
 - a. Exterior Acrylic Latex Gloss Finish.
 - i. 2 finish coats over primer with total dry film thickness of not less than 5.0 mils. Back prime all trim.
 - ii. 1st Coat: S-W Exterior Oil-Based Wood Primer, Y24W08020 (4 mils wet, 2.2 mils dry).
 - iii. 2nd Coat: S-W SuperPaint Exterior Latex Gloss Paint, A84 Series.
 - iv. 3rd Coat: S-W SuperPaint Exterior Latex Gloss Paint, A84 Series (4 mils wet, 1.5 mils dry per coat).
- 2. Stained Woodwork.
 - a. Acrylic Solid Color Stain.
 - i. Stained Finish: 2 Coats of stain on open grain wood.
 - ii. 1st Coat: S-W Woodscapes Exterior Acrylic Solid Color Stain (200-400 sq ft/gal) @ 4-8 mils wet; 1.3-2.6 mils dry.
 - iii. 2nd Coat: S-W Woodscapes Exterior Acrylic Solid Color Stain (200-400 sq ft/gal) @ 4-8 mils wet; 1.3-2.6 mils dry.

D. EXTERIOR MASONRY UNITS

- 1. Concrete / Mortar Surfaces (Pre-cast, Cast-In-Place, EIFS, Stucco, etc).
 - a. Acrylic Coating.
 - i. 1st Coat: S-W Loxon Concrete & Masonry Primer / Sealer, LX02W0050 (5.3 – 8.0 mils wet, 2.1 – 3.2 mils dry per coat).
 - ii. 2nd Coat: S-W Loxon Self-Cleaning Acrylic Coating, LX13 Series.
 - iii. 3rd Coat: S-W Loxon Self-Cleaning Acrylic Coating, LX13 Series (5.0 – 7.0 mils wet, 2.1 – 2.9 mils dry per coat).

2. Concrete Masonry Units (CMU).
 - a. Acrylic Coating.
 - i. 1st Coat: S-W Pro Industrial Heavy Duty Block Filler, B42W00150 (16.0 – 21.0 mils wet, 8.0 - 10.5 mils dry per coat).
 - ii. 2nd Coat: S-W Loxon Self-Cleaning Acrylic Coating, LX13 Series.
 - iii. 3rd Coat: S-W Loxon Self-Cleaning Acrylic Coating, LX13 Series (5.0 – 7.0 mils wet, 2.1 – 2.9 mils dry per coat).

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).
 - b. *(Contractor Option)* Waterbased 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 Pro Industrial Waterbased Alkyd Urethane Enamel, Gloss Finish, B53 Series.
 - iv. 3rd Coat: S-W Pro Industrial Waterbased Alkyd Urethane Enamel, Gloss Finish, B53 Series, (1.4 – 1.7 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. Concrete Masonry Units (CMU).

- a. Latex Semi-Gloss Enamel Finish
 - i. 2 Finish coats over filled surface with total dry film thickness of not less than 11.4 mils.
 - ii. 1st Coat: S-W Pro Industrial Heavy Duty Block Filler, B42W00150 (16.0 – 21.0 mils wet, 8.0 - 10.5 mils dry per coat).
 - iii. 2nd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31W12651 Series.
 - iv. 3rd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31W12651 Series (4 mils wet, 1.5 mils dry per coat).
 - v. Locations: Typical at all CMU unless otherwise indicated in the schedule.
- b. Epoxy - Pre-Catalyzed Waterbased Semi-Gloss Finish.
 - i. 2 Finish coats over filled surface with total dry film thickness of not less than 11.4 mils.
 - ii. 1st Coat: S-W Pro Industrial Heavy Duty Block Filler, B42W00150 (16.0 – 21.0 mils wet, 8.0 - 10.5 mils dry per coat).
 - iii. 2nd Coat: S-W Pro Industrial® Pre-Catalyzed Waterbased Epoxy Semi-Gloss, K46-01151 Series (4 mils wet, 1.4 mils dry per coat).
 - iv. 3rd Coat: S-W Pro Industrial® Pre-Catalyzed Waterbased Epoxy Semi-Gloss, K46-01151 Series (4 mils wet, 1.4 mils dry per coat).
 - v. Locations: All Wet Areas in Athletic Facilities.
- c. Epoxy – Catalyzed Waterbased EgShel Finish.
 - i. 2 Finish coats over filled surface with total dry film thickness not less than 14.0 mils.
 - ii. 1st Coat: S-W Pro Industrial Heavy Duty Block Filler, B42W00150 (16.0 – 21.0 mils wet, 8.0 - 10.5 mils dry per coat).
 - iii. 2nd Coat: S-W Pro Industrial Catalyzed Waterbased Epoxy EgShel Finish, B73-360 Series.
 - iv. 3rd Coat: S-W Pro Industrial Catalyzed Waterbased Epoxy EgShel Finish, B73-360 Series (5.0 – 12.0 mils wet, 2.0 – 5.0 mils dry per coat).

- v. Locations:
 - 1. All Showers Areas.
 - 2. Kitchens / Cafeterias / Servicing / Dining / Kitchen Storage / Dishwashing / Freezer-Coolers.
 - 3. FACS.
- 2. 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. GYPSUM DRYALL

- 1. Walls and Ceilings
 - a. Interior Acrylic Latex Semi-Gloss Finish.
 - i. 3 Coat system with dry film thickness not less than 3.8 mils.
 - ii. 1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W02600 (4 mils wet, 1.0 mils dry).
 - iii. 2nd Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss Finish, B31W02651 Series.
 - iv. 3rd Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss Finish, B31W02651 Series (4 mils wet, 1.5 mils dry per coat).
 - v. Locations: Typical at all Gypsum Drywall Walls and Ceilings unless otherwise indicated in the schedule.
 - b. Epoxy - Pre-Catalyzed Waterbased EgShel Finish.
 - i. 2 Finish coats over Primer with total dry film thickness not less than 14.0 mils.
 - ii. 1st Coat: S-W ProMar 200 Zero VOC Latex Primer, B28W02600 (4 mils wet, 1.0 mils dry).
 - iii. 2nd Coat: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy EgShel Finish, K45-01151.
 - iv. 3rd Coat: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy EgShel Finish, K45-01151 (2-4 mils dry per coat).
 - v. Locations: Walls and Ceilings at Showers Areas. *NOT in Shower Stalls.*
 - c. *(Contractor Option)* Epoxy - Catalyzed Waterbased EgShel Finish.
 - i. 2 Finish coats over Primer with total dry film thickness not less than 14.0 mils.
 - ii. 1st Coat: S-W ProMar 200 Zero VOC Latex Primer, B28W02600 (4 mils wet, 1.0 mils dry).

- iii. 2nd Coat: S-W Pro Industrial Catalyzed Waterbased Epoxy EgShel Finish, B73-360 Series.
- iv. 3rd Coat: S-W Pro Industrial Catalyzed Waterbased Epoxy EgShel Finish, B73-360 Series (5.0 – 12.0 mils wet, 2.0 – 5.0 mils dry per coat).
- v. Locations: Walls and Ceilings at Showers Areas. *NOT in Shower Stalls.*

E. 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)
- 3. Wall Panels (Wood and Acoustical).
 - a. Interior Semi-Gloss Finish 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, B31W02651 Series
 - iii. 3rd Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31W02651 Series (4 mils wet, 1.5 mils dry per coat)

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.
- 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.airperformancellc.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:

New Softball Complex at
Daphne High School for the
Baldwin County Board of Education
Daphne, Alabama

LOUVERS
10200-3

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:

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 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.

1. Aluminum: Aluminum, 5/8 inches by 0.040 inch (16 mm by 1 mm), expanded and flattened.
2. 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.

C. 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).
- D. Visible Mullions: Manufacturer's standard horizontal or vertical visible mullions for architectural accent as indicated on drawings.

2.4 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.

2.5 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).

2.6 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

3.1 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.

3.2 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.

3.3 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 10350 - FLAGPOLE

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 flagpoles is indicated on the drawings.

1.3 QUALITY ASSURANCE

- A. Manufacturing Standards: Provide each flagpole as a complete unit produced by a single manufacturer, including fittings accessories, bases and anchorage devices.
- B. Design Criteria: Provide flagpoles and installations constructed to withstand a 90 mph wind velocity minimum when flying flag of appropriate size. Use heavy pipe sizes if required for flagpole type and height shown.
- C. Pole Construction: Construct pole and ship to site in one piece if possible. If more than one piece is necessary, provide snug fitting, precision joints with self-aligning, internal splicing sleeve arrangement for weather-tight, hairline field joints.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for each type of flagpole required.
- B. Shop Drawings: Submit shop drawings of flagpoles and bases, showing general layout, jointing and complete anchoring and supporting systems.
- C. Samples: Submit samples of each finished metal for flagpoles, and accessories as may be requested.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Spiral wrap flagpoles with heavy Kraft paper or other protective wrapping and prepare for shipment in hard fiber tube or other protective container.
- B. Deliver flagpoles and accessories completely identified for installation procedure. Handle and store flagpoles to prevent damage or soiling.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. Morgan-Francis Flagpoles and Accessories | www.morgan-francis.com | PH: 1.800.814.9568.
 - 2. Acme Lingo Flagpoles | www.acmelingo.net | PH: 1.800.260.1897.
 - 3. American Flagpole, Div. of Kearney-National | www.concordamericanflagpole.com | PH: 972.380.8186.
 - 4. Eder Flag & Baartol Company / A Division of Eder Flag Manufacturing Co., Inc. | www.ederflag.com | PH: 1.800.558.6044 or 414.764.3522.
 - 5. Equal products of other manufacturers may be used provide such products have been approved, by the Architect, not less than Ten (10) days prior to scheduled bid opening.

2.2 FLAGPOLE TYPE

- A. Aluminum Flagpoles: Fabricate aluminum flagpoles from seamless extruded tubing complying with ASTM B 241, alloy 6063-T6, having a minimum wall thickness of 3/16" (0.1875"), tensile

strength not less than 35,000 psi and a yield point of 30,000 psi. Heat-treat and age-harden flagpoles after fabrication.

- B. Flagpole Heights as follows:
 - 1. 40 feet above grade.
- C. Provide cone tapered aluminum flagpole.

2.3 FLAGPOLE MOUNTING

- A. Provide manufacturer's standard base system for the type of flag pole installation required.
- B. Base Plate: For anchor-bolt mounting, furnish manufacturer's standard cast metal shoe base of same material as flagpole. Furnish and install anchor bolts and lightning ground spike as required.
- C. Foundation Tube: For ground-set flagpoles, provide 16-gage minimum galvanized corrugated steel tube, or 12-gage rolled steel tube, sized to suit flagpole and installation. Furnish complete with welded steel bottom base and support plate, lightning ground spike, and steel centering wedges, all welded construction. Provide loose hardwood wedges at top for plumbing pole after erection. Galvanize steel parts after assembly, including foundation tube.
 - 1. Provide manufacturer's standard flash collar, finished to match flagpole.

2.4 SHAFT FINISH

- A. Aluminum: Fine, directional, mechanical satin polish (NAAMM-32), finished as follows:
 - 1. Color: Clear anodized finish complying with NAAMM-C22A42, Class I (0.7 mil.)

2.5 FITTINGS

- A. Finial Ball: Manufacturer's standard flush seam ball, size as indicated or, if not indicated, to match pole butt diameter.
 - 1. 14 ga. spun aluminum,
 - 2. Brass color.
- B. Truck: Ball-bearing non-fouling, revolving, double-track assembly of cast metal, finished to match pole shaft.
- C. Cleats: Two 9" cast metal cleats with fasteners, finished to match pole shaft.
- D. Halyards: Provide 2 continuous halyards for each flagpole, as follows:
 - 1. Polypropylene, bronze, braided
 - 2. Size: 3/8" (No. 12).
- E. Halyard Flag Snaps:
 - 1. Provide 2 swivel snaps per halyard
 - 2. Aluminum.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Flagpole Installation: Install flagpoles as shown and in compliance with final shop drawings and manufacturer's instructions.

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)
 - 2. Metal Letters
 - 3. Plaque
 - 4. Project Sign
- 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.

2.4

(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

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

“Investing in Alabama’s Future”

(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.activarcp.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. Furnish and install factory-assembled Heavy-Duty MIG-Welded Metal Lockers, complete, as shown and specified per contract documents.

RELATED WORK

Section 03310, Cast-In-Place Concrete.

- A. Section 06100, Rough Carpentry.

1.3 QUALITY ASSURANCE

- A. All lockers shall be factory-assembled, of all MIG welded construction, in multiple column units to meet job conditions. **Assembly of locker bodies by means of bolts, screws, or rivets will not be permitted. Welding of knockdown locker construction is not acceptable.** Grind exposed welds and metal edges flush and make safe to touch.
- B. MANUFACTURING STANDARD: Provide metal lockers that are standard products of a single manufacturer, with interchangeable like parts. Include necessary mounting accessories, fittings, and fastenings.
- C. FABRICATOR QUALIFICATIONS: Firm experience (minimum 5 years) in successfully producing the type of metal lockers indicated for this project, with sufficient production capacity to produce required units without causing delay in the work.
- D. INSTALLER QUALIFICATIONS: Engage an experienced (minimum 2 years) installer who has successfully completed installation of the type of metal lockers and extent to that indicated for this project.
- E. Lockers shall be GREENGUARD Children & Schools CertifiedSM

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, showing locker types, sizes, quantities, Show lockers in detail, method of installation, fillers, trim, base, and accessories. Include locker numbering sequence information.

1.5 PRODUCT HANDLING

- A. GENERAL: All work shall be fabricated in ample time so as to not delay construction process.
- B. DELIVERY: All materials shall be delivered to the site at such a time as required for proper coordination of the work. Materials are to be received in the manufacturer's original, unopened packages and shall bear the manufacturer's label.

STORAGE: Store all materials in a dry and well ventilated place adequately protected from the elements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to established minimum standards for materials, workmanship and functions:
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. ASI Storage Solutions; 900 Clary Connector, Eastanollee, Georgia 30538; www.asistorage.com; PH: 706.827.2720.
 3. Penco; 1820 Stonhenge Drive, Greenville, NC 27858; www.pencoproducts.com; PH: 800.562.1000.
 4. LockersMFG | P.O. Box 383258 Germantown, TN 38183 | Ph:901.207.6573. | www.lockersmfg.com.

2.2 LOCKERS

A. ATHLETIC TEAM FULLY FRAMED ALL-WELDED LOCKERS

1. Location(s): As indicated on Drawings.
2. Type:
 - a. **Single Tier 18" (W) x 18" (D) x 72" (H)**
3. Materials:
 - a. Steel Sheet: All sheet steel used in fabrication shall be prime grade free from scale and imperfections and capable of taking a heavy coat of custom blend powder coat.
 - b. Fasteners: Cadmium, zinc or nickel plated steel; bolt heads, slotless type; self locking nuts or lock washers.
 - c. Hardware: Hooks and hang rods of cadmium plated or zinc plated steel or cast aluminum.
 - d. Handle: Seamless drawn 304 stainless steel recessed handle.
 - a. Number Plates: To be aluminum with not less that 3/8" high etched numbers attached to door with two aluminum rivets. **NOTE: Prior to placing any orders for Number Plates, the General Contractor is responsible for verifying Locker numbering sequence with the Owner.**
4. Construction: Fabricate lockers square, rigid, and without warp, with metal faces flat and free of dents or distortion. All lockers shall be factory-assembled, of all MIG welded construction, in multiple column units to meet job conditions. Assembly of locker bodies by means of bolts, screws, or rivets will not be permitted. Welding of knockdown locker construction is not acceptable. Grind exposed welds and metal edges flush and make safe to touch.
5. Frame / Vertical Side panels: Shall be of 13 gauge 1/2" flattened expanded metal framed by 16 gauge Hollow "T" tubular sections and channel frame members designed to enclose all four edges of the side panel with the entire assembly MIG welded to form a rigid frame for each locker. The channel frame members are welded to the front and rear vertical frame members to create and anchor bearing surface of 1-1/4 inches wide x the depth of the locker at each side panel. Note: Diamond perforated sheet steel or 3/4" expanded metal will NOT be accepted.
6. Integral Frame Locker base: 14 gauge formed structural channels are MIG welded to the front and rear vertical side panel frame members to allow placement of locker bottom a minimum 2-3/4" above floor level. Locker bottom shelf located less than 2" above floor level will not be acceptable.
7. Wardrobe Doors: Doors 20" high and over and 15" wide and under are to be fabricated from single sheet prime 14 gauge 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 for 18" and wider lockers shall include a 3" wide minimum 18 gauge full height channel door stiffener MIG welded to the hinge side of the door as well as to the top and bottom door return bends and spot welded to the inside of door face to form a rigid torque-free box reinforcement for the door. Doors to be perforated with 5/8" x 1-1/2" diamonds.
8. Latch: The latching mechanism shall be finger lift control type constructed of 14 gauge (minimum) steel with a nylon cover that has a generous finger pull. Lock bar shall be hot dip galvanized and installed after paint to ensure proper paint coverage and lock bar operation. 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 device shall be designed for use with either built-in combination locks or padlocks. Latch hooks shall be 11 gauge (minimum) with riveted bumpers and shall be MIG welded to vertical frame member. Provide three latch hooks for doors 48" and over and two for doors under 48".
 9. P.E. Gym Doors 12" High And Under: Doors 12" high and under to be top hinged and be fabricated from single sheet prime 14 gauge with single bend at top and sides with a double bend at latch point (bottom). A spring loaded galvanized latch assembly shall be securely welded to the inside of the door. The latch shall be a minimum of 11 gauge, be equipped with a stainless steel spring and shall automatically engage when door is closed. Rubber bumpers shall be riveted to return bends on doors. Locking device shall be designed for use with both a padlock and built-in lock. Padlock Strike Plates are required. Doors to be perforated with 7/16" x 15/16" diamonds.
 10. P.E. Gym Doors 15" And 18" High: Doors 15" and 18" high to be side hinged and be fabricated from single sheet prime 14 gauge with single bend at top and bottom and double bends at hinge and latch sides. A spring loaded galvanized latch assembly shall be securely welded to the inside of the door. The latch shall be a minimum of 11 gauge, be equipped with a stainless steel spring and shall automatically engage an 11 gauge full height continuous door strike when the door is closed. The door strike is to be MIG welded to the frame. Rubber bumpers shall be riveted to return bends on doors. Locking device shall be designed for use with both a padlock and built-in lock. Padlock Strike Plates are required. Doors to be perforated with 7/16" x 15/16" diamonds.
 11. Handle: Seamless Drawn Locker Handle: All wardrobe doors 20" high and over shall have a seamless drawn not less than 304 stainless steel recessed handle shaped to receive a padlock or built-in combination lock. The recessed handle shall be deep enough to have the lock be completely flush with the outer door face.
 12. Door Hinges: Hinges for wardrobe and side hinged gym doors shall not be less than 3-1/2" long 13 gauge seven knuckle pin type, securely riveted to frame and welded to the door. Doors are to be secured to frame with a minimum of two tamper resistant rivets per hinge. Provide 3 hinges for doors 48" and higher and 2 for doors shorter than 48". All doors shall be right hand side hinged except top hinged gym doors as noted above. Top hinged gym doors shall be hinged using a 3/16" diameter continuous hinge rod completely recessed into the door with a concealed fastener.
 13. Flat Tops: Shall be formed of one piece of 16 gauge cold rolled sheet steel and shall be an integral part MIG welded to each vertical side panel frame member and be continuous to cover the full width of a multiple framed locker unit.
 14. Hat Shelves, Intermediate Shelves And Bottoms: Shall be 16 gauge galvanized sheet steel, have double bends at front and shall engage slots in the Hollow "T" vertical frame members at all four corners and be securely welded to the frame and side. Locker bottom shelf located less than 2" above floor level will not be acceptable.
 15. Backs: Shall be 18 gauge cold rolled sheet steel, be continuous to cover a multiple framed unit and be welded to each vertical side panel frame member.
 16. 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.

- a. **Color to be selected by Architect from manufacturer's standard list of colors.** Two-Tone Color Combination: Shall be at no additional cost with the locker body, frame and trim chosen from one color and the doors may be one of any other color chosen from manufacturers standard selection.

17. Equipment: Furnish each locker with the following items, unless otherwise shown.

- a. Single tier lockers: Openings 60" and 72" shall include one galvanized hat shelf, one double prong ceiling hook and a minimum of two single prong wall hooks.
- b. Double and Triple tier lockers: Openings 20" thru 36" high shall include one double prong ceiling hook and a minimum of two single prong wall hooks.
- c. Finished End Panels (If required): Shall be "Boxed" type formed from 16 gauge cold rolled steel with 1" O.D. double bends on sides and a single bend at top and bottom with no exposed holes or bolts. If lockers have slope tops, end panels must be formed with slope at top to cover the ends of the slope tops. Finished to match lockers. Provide at all exposed ends.
- d. Continuous Slope Tops (If required): Not less than 18 gauge sheet steel approximately 18 degrees pitch, in lengths as long as practical but not less than four lockers. To be installed in addition to the locker flat top with end closures for support. Finished to match lockers.
- e. Fillers (if required): Provide where indicated, of not less than 16 gauge sheet steel, factory fabricated and finished to match lockers.

18. LOCKS:

- a. Not Required.

19. Lifetime Warranty: Lockers shall be covered against all defects in materials and workmanship excluding finish, damage resulting from deliberate destruction and vandalism under this section for the lifetime of the facility.

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 through back-up reinforcing plates where necessary to avoid metal distortion; conceal fasteners insofar as possible.
- C. Install trim, and metal filler panels where indicated, using concealed fasteners to provide flush, hairline joints against adjacent surfaces.

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

New Softball Complex at
Daphne High School for the
Baldwin County Board of Education
Daphne, Alabama

Project No: 23.199

LOCKERS
10500-5

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 - Furnished by Owner, Installed by Contractor
 - 2. Toilet Tissue Dispensers - Furnished by Owner, Installed by Contractor
 - 3. Paper Towel Dispensers - Furnished by Owner, Installed by Contractor
 - 4. Grab Bars
 - 5. Mirror Units
 - 6. Utility Shelf/Mop Rack
 - 7. Handicapped shower seat
 - 8. Shower Rod
 - 9. Vinyl Shower Curtain
 - 10. Shower Curtain Hooks
 - 11. Double Robe Hook at Shower Units
 - 12. Baby Changing Station

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.

New Softball Complex at
Daphne High School for the
Baldwin County Board of Education
Daphne, Alabama

TOILET ACCESSORIES
10800-1

1. Soap Dispensers:
 - Wall Mounted over each sink
 - a. Approved Products:
 - i. Bobrick #B-2112
 - ii. ASI #0345
 - iii. Bradley #6562
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

7. Handicapped Shower Seat:
 - a. Locations as Indicated on drawings
 - b. Approved Products:
 - i. Bobrick #B5181
 - ii. Bradley #9565
 8. Shower Rod:
 - a. At each shower unit as indicated on the drawings, shower rod unit shall be polished stainless steel
 - b. Approved Products:
 - i. Bradley #9531-4
 - ii. ASI #1204
 - iii. Bobrick #B6047
 9. Vinyl Shower Curtain:
 - a. Curtain shall be 8 gauge vinyl fabric
 - b. 72" high
 - c. 6" wider than opening up to 48"
 - d. 12" wider than openings exceeding 48"
 - e. Color as selected by the architect after bid date from manufacturer standards.
 - f. Approved Products:
 - i. ASI #1200-V
 10. Shower Curtain Hooks:
 - a. Supply stainless steel hooks for each shower curtain as required
 - b. Approved Products:
 - i. ASI #1200-SHU
 11. Double Robe Hook:
 - a. At Shower Units
 - b. Finish: Polished stainless steel.
 - c. Approved Products:
 - i. Bradley #9125
 - ii. ASI #7345
 - iii. Bobrick #B-7672
 12. Baby Changing Station
 - a. At locations indicated on drawings.
 - b. Approved Products:
 - i. Koala Kare Model No. KB200
 - ii. Color to be selected by Architect after bid date from manufacturer's standards.
 - iii. Include 1 case of Bed Liners Model No. KB150-99.
- 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 11200 - BATTING CAGES

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 batting cages equipment is shown on drawings.
- B. General Scope: Provide system complete and ready for use, including standards, nets, cable, hooks, ropes, etc.
- C. Equipment shall be unloaded from transporters and installed by equipment manufacturers or their authorized agent.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, specifications, installation, and maintenance instructions for each type of equipment required.
 - 1. Provide templates for anchor bolts and other items encased in concrete or below finished surfaces in time to not delay 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. PSS Performance Sports Systems./Gared Holdings, LLC.; 9200 E. 146th St., Noblesville, IN 46060; p. 800-757-6081; www.perfsports.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. BATTING CAGE

- 1. 4080-70 – Indoor Multi-Sport Cage Model 4080 Multi Sport Cage: Cage including cables, clamps for attachment to building structure, threaded rod supports, and other components required for complete functional installation.
- 2. Quantity: **2 Batting Cage Systems Total**

B. Components:

1. OVERHEAD SUPERSTRUCTURE:

- a. The batting cage is supported from the roof structure by directly attaching to the underneath side of the roof truss or by attaching to Uni-strut, 4/O Chain, or 3 ½" O.D. horizontal and 2 3/8" O.D. vertical structural tubing supplied by the manufacture. Bridge pipe will be required when truss spans exceed 14'. Superstructure shall be furnished with standard black finish.

2. NET MATERIAL

- a. Cage net shall be model 4087, 12'-0" [3.66 m] high x 12'-0" [3.66 m] wide by 70' [21.3 m] long. An additional 12" [3.66 m] of net shall drape on the floor preventing balls from going under the cage. Net shall be constructed with #252 black knotted nylon with 3/4" [19 mm] square mesh and shall be capable of stopping a baseball, softball and golf ball. Entrance shall be through an overlapping net opening on each end. This feature shall allow one sidewall to be opened for use as a golf cage. Contact factory for special sizes

and materials.

3. DRIVE / SUPPORT STRUCTURE

- a. The model 4080-70 Multi-Sport Cage shall be manually operated by an curtain hoist.
- b. Curtain hoist shall drive a continuous 2-3/8"[60 mm] O.D. drive shaft. The cage shall be lifted by means of 1/8" [3 mm] galvanized aircraft cable rated at 2000 lbs [907 kg] breaking strength. Lift cables shall be spaced at no greater than 12'-0" [3.66 m] center to center. Each cable shall be taken up on individual aluminum spools located on the drive shaft.
- c. The drive shaft shall be supported by a carrier assembly spaced no greater than 12'-0" [3.66 m] center to center. The carrier shall consist of a formed bracket with two rubber wheels on which the drive shall rotate.
- d. Cage support frame shall be constructed of 1.9" O.D. steel tubing. Support frame shall be furnished with standard black powder coat finish. Optional colors available. The support frame may be lowered to the floor while placing the four sides of netting on top of the frame to allow for compact storage.
- e. The top of the cage net shall be suspended approximately 6" [152 mm] below the cage support frame.

2.3 WARRANTY

- A. Warranted against defects in material and/or fabrication for 12 months from the date of delivery.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install equipment in accordance with manufacturer's instructions and placement drawings.
- B. Coordinate placement of anchors and accessories.

END OF SECTION

SECTION 11400 - 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 1 Specification Sections apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Food service equipment indicated on Drawings and schedules.
 - 2. **Contractor-Furnished & Contractor Installed Equipment:** Where indicated, the General Contractor will furnish and install equipment items and make final electrical and mechanical and plumbing connections.
- B. Special Note:
 - 1. Each Equipment Contractor bidding on this work shall carefully read these specifications, examine the drawings accompanying them and then submit his bid subject to all conditions therein contained.
 - 2. The submitting of a bid by the Equipment Contractor shall constitute full evidence that he has viewed the architectural, mechanical, structural, such other plans and specifications necessary pertaining to same and that he is fully cognizant of the conditions under which the work must be conducted.
- C. Scope:
 - 1. All new food service equipment to be furnished and installed prior to the building being completed.
 - 2. Equipment Contractor is to furnish all material, equipment and items as called for on drawings and specified herein.
 - 3. Equipment Contractor is responsible for delivery, assembly, erection and leveling all equipment included herein at locations shown on plans. He shall leave same with outlets for connections as standardized by the various food service equipment manufacturers, for other contractors to make final steam, plumbing, electric, and ventilating connections.
 - 4. Equipment Contractor to provide for erection, placing of equipment and to counsel with other contractors in regard to connections at time of installation. He is to deliver to other contractors all plumbing, steam fitting and electrical parts that are furnished loose as a part of the equipment, and counsel with other trades for proper installation by them, if requested to do so.
 - 5. Equipment Contractor to furnish trim of same material as body of fixtures where necessary to create sanitary conditions and finished appearance.
 - 6. Equipment Contractor to clean up all debris made by his workman immediately upon completion of installation and remove same from premises. Equipment to be cleaned just prior to Owner's acceptance so as to be free from dirt and dust accruing from building conditions.
- D. Qualifications of Bidders:
 - 1. It is required that all special fabricated equipment such as sinks, tables, counters, 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. The fabricator is subject to approval of Architect and/or Owner. All work in the above category manufactured by one manufacturer, of standard unit assembly, uniform design and finish.

1.3 DEFINITIONS

- A. Terminology Standard: Refer to NSF 2, "Food Equipment" or other applicable NSF standards for definitions of food service equipment and installation terms not otherwise defined in this Section or in other referenced standards.

1.4 SUBMITTALS

- A. Schedule: Provide initial submittals, as required below, within 30 days of notice of award.
- B. Product Data: For each type of food service equipment indicated. Include manufacturer's model number and accessories and requirements for access and maintenance clearances, water and drainage, power or fuel, and service-connections including roughing-in dimensions.
- C. Shop Drawings: For food service equipment not manufactured as standard production and catalog items by manufacturers. Include plans, elevations, sections, roughing-in dimensions, fabrication details, service requirements, and attachments to other work.
- D. Wiring Diagrams: Details of wiring for power, signal, and control systems and differentiating between manufacturer-installed and field-installed wiring.
- E. Piping Diagrams: Details of piping systems and differentiating between manufacturer-installed and field-installed piping.
- F. Coordination Drawings: For locations of food service equipment and mechanical and electrical service utilities. Key equipment with item numbers and descriptions indicated in Contract Documents. Include plans and elevations of equipment, access- and maintenance-clearance requirements, details of concrete or masonry bases and floor depressions, and service-utility characteristics and dimensioned locations. Locate all floor drains, floor sinks, and floor troughs accurately with dimensions in relation to equipment. Locate ANSUL system control panel and exhaust Fan switch.
- G. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for exposed products with color finishes.
- H. Samples for Verification: Of each type of exposed finish required, minimum 4-inch- (100-mm-) square or 6-inch- (150-mm-) long sections of linear shapes and of same thickness and material indicated for work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
- I. Product Certificates: Signed by manufacturers of refrigeration systems or their authorized agents certifying that systems furnished comply with requirements and will maintain operating temperatures indicated in the areas or equipment that they will serve.
- J. Maintenance Data: Operation, maintenance, and parts data for food service equipment to include in the maintenance manuals specified in Division 1.
- K. Product Schedule: For each food service equipment item, include item number and description indicated in Contract Documents, manufacturer's name and model number, and authorized service agencies' addresses and telephone numbers.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer to perform work of this Section who has specialized in installing food service equipment, who has completed installations similar in design and extent to that indicated for this Project, and who has a record of successful in-service performance.
- B. Manufacturer Qualifications: Engage a firm experienced in manufacturing food service equipment similar to that indicated for this Project and with a record of successful in-service performance.
- C. Source Limitations: Obtain each type of food service equipment through one source from a single manufacturer.
- D. Product Options: Drawings and specifications indicate food service equipment based on the specific products indicated. Other manufacturers' equipment with equal size and performance

characteristics may be considered. Refer to Division 1 Section "Substitutions."

- E. Regulatory Requirements: Comply with the following National Fire Protection Association (NFPA) codes:
 - 1. NFPA 17, "Dry Chemical Extinguishing Systems."
 - 2. NFPA 17A, "Wet Chemical Extinguishing Systems."
 - 3. NFPA 54, "National Fuel Gas Code."
 - 4. NFPA 70, "National Electrical Code."
 - 5. NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations."
- F. Listing and Labeling: Provide electrically operated equipment or components specified in this Section that are listed and labeled.
- G. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
- H. AGA Certification: Provide gas-burning appliances certified by the American Gas Association (AGA).
- I. ASME Compliance: Fabricate and label steam-generating and closed steam-heating equipment to comply with ASME Boiler and Pressure Vessel Code.
- J. ASHRAE Compliance: Provide mechanical refrigeration systems complying with the American Society of Heating, Refrigerating and Air-Conditioning Engineers' ASHRAE 15, "Safety Code for Mechanical Refrigeration."
- K. NSF Standards: Comply with applicable NSF International (NSF) standards and criteria and provide NSF Certification Mark on each equipment item, unless otherwise indicated.
- L. 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 siphonage in water piping.
- M. SMACNA Standard: Where applicable, fabricate food service equipment to comply with the Sheet Metal and Air Conditioning Contractors National Association's (SMACNA) "Kitchen Equipment Fabrication Guidelines," unless otherwise indicated.
- N. *Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings." Review methods and procedures related to food service equipment including, but not limited to, the following:***
 - 1. Review access requirements for equipment delivery.
 - 2. Review equipment storage and security requirements.
 - 3. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
 - 4. Review structural loading limitations.
 - 5. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver food service equipment as factory-assembled units with protective crating and covering.
- B. Store food service equipment in original protective crating and covering and in a dry location.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions of food service equipment installation areas by field measurements before equipment fabrication and indicate measurements on Shop Drawings and Coordination 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 required dimensions and proceed with fabricating equipment without field measurements. Coordinate construction to ensure actual dimensions correspond to established dimensions.

1.8 COORDINATION

- A. Coordinate equipment layout and installation with other work, including light fixtures, HVAC equipment, and fire-suppression system components.
- B. Coordinate location and requirements of service-utility connections.
- C. Coordinate size, location, and requirements of concrete bases, positive slopes to drains, floor depressions, and insulated floors.
- D. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

1.9 WARRANTY

- A. General Warranty: The warranties specified in this section 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.

PART 2 – MATERIALS

2.1 SUBSTITUTION OF BRAND NAME EQUIPMENT

- A. Bids submitted on items of standard manufactured equipment shall be on specific brands of equipment of size, capacity and specifications as shown on the drawings or as specified.
- B. Any Bidder wishing to supply alternate equipment other than that specified shall submit a request for substitution to the Architect at least 10 days prior to Bid Date for approval or disapproval. If a substitution is approved, an addendum will be issued.
- C. **Bidders requesting such substitutions are cautioned to examine mechanical and electrical plans and building conditions to determine if such substitutions will require changes in mechanical or electrical connections or require rearrangement. If any of the above changes would be involved, a layout of such changes and any additional cost (itemized) must be submitted with the request for substitution. If proposed substitutions entail additional cost which was not submitted with the request for substitution and approval is granted, bidder shall be responsible for such costs.**
- D. In addition, a request for substitution must be accompanied by the manufacturer's specification and a Substitution Request which provides the Architect with a detail description of the manner in which the proposed substitution conforms and/or varies from the item specified. It is understood by the Architect and Owner that no agent, dealer, broker or agency may bind a manufacturer beyond the manufacturer's own printed literature. Therefore, any party submitting a Substitution Request stating compliance with a feature specified for the prime specified item by a manufacturer in a manner not identified as a standard of production or as an option for that item in the manufacturer's own letterhead stating that the manufacturer shall comply with the specified feature and such compliance shall not adversely affect the manufacturer's product performance, reliability, durability, appearance or effect the warranty.
- E. If the substituted item is approved and subsequently installed and upon final inspection found to deviate from the specifications in a manner not detailed in the Substitution Request the Equipment Contractor shall at the discretion of the Architect or Owner bring the equipment into compliance or remove the equipment and replace it with one in compliance with specifications at his own cost. Awarded Contractor shall be responsible for deviation not detailed in the Substitution Request submitted FROM ANY SOURCE. Approval of submittals by the Architect does not relieve the Equipment Contractor of this condition.
- F. No request for substitution will be considered after 10 days prior to date bid except in instances where the item is no longer available.

2.2 PERMITS & LICENSES

- A. The equipment Contractor to give proper authorities all notices as required by law relative to work in his charge, obtain all official permits, licenses, etc., pay such proper and legal fees to public officers and others as necessary for faithful performance of the work, and which may arise incidental to fulfilling these specifications.

2.3 WORK BY OTHERS

- A. All plumbing, steam, electrical and ventilation work, both material and labor, required to connect this equipment furnished by other contractors unless specifically called for in "Itemized Specifications". The work done by other contractors to include roughing-in to points indicated on mechanical plan and final connecting from rough-in point to various pieces of equipment requiring such connections and the supplying of all necessary materials and labor for this work except as hereinafter noted.
- B. All traps, grease traps, tail pieces, valves, stops, shutoffs and fittings necessary, are to be furnished and installed under mechanical contract by others, unless specifically called for under item specifications.
- C. All steam traps, valves, shutoffs, condensate pumps, and fittings necessary are to be furnished and installed under mechanical contract by others.
- D. Plumbing and steamfitting contractors to see that all lines are flushed free of foreign matter before connecting fixtures.

2.4 TESTING & OPERATING INSTRUCTIONS

- A. After all utility connections to equipment are made by other contractors, Equipment Contractor to conduct final test of equipment in presence of Architect, Owner or their duly authorized representative.
- B. Equipment Contractor to furnish three (3) sets of operating instructions for each piece of mechanical equipment bound in cardboard cover. Complete list of service agencies shall also be included.

2.5 PRODUCTS

- A. The following specifications apply to all items mentioned hereinafter and embrace the particular details of construction. All deviations described within item itself.
- B. The following food service equipment specified was used to establish minimum requirements for basis of design layout and for electrical and mechanical loads, proposed substitutions of equipment that entail additional costs for electrical or mechanical not submitted with the request for substitution shall be responsibility of the bidder.**
 1. ICE MACHINE - Hoshizaki Model F-450MAJ-C
 - a. 115V/60/1 Single Phase direct connection 10.0 amps.
 - b. Cubelet Style Ice; Maximum 412 lbs. of ice production per 24 hours.
 - c. Stainless Steel finish.
 - d. Advanced CleanCycle24® design
 - e. R-404A refrigerant.

2.6 MATERIALS

- A. Sealant: ASTM C 920; Type S, Grade NS, Class 25, Use NT. Provide elastomeric sealant NSF certified for end-use application indicated. Provide sealant that, when cured and washed, meets requirements of Food and Drug Administration's 21 CFR, Section 177.2600 for use in areas that come in contact with food.
 1. Color: As selected by Architect from manufacturer's full range of colors.
 2. Backer Rod: Closed-cell polyethylene, in diameter larger than joint width.
- B. Tempered Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated surfaces),

Type I (transparent), Class 1 (clear), Quality q3 (glazing select). Provide products complying with ANSI Z97.1, manufactured by horizontal (roller-hearth) process, and 6 mm thick, unless otherwise indicated. Provide exposed safety edges, if any, seamed before tempering.

- C. Plastic: Except for plastic laminate, provide plastic materials and components complying with NSF 51.
- D. Sound Dampening: NSF-certified, nonabsorbent, hard-drying, sound-deadening coating. Provide coating compounded for permanent adhesion to metal in 1/8-inch (3-mm) thickness that does not chip, flake, or blister.
- E. Gaskets: NSF certified for end-use application indicated; of resilient rubber, neoprene, or PVC that is nontoxic, stable, odorless, nonabsorbent, and unaffected by exposure to foods and cleaning compounds.

2.7 ACCESSORIES

- A. Cabinet Hardware: Provide NSF-certified, stainless-steel hardware for equipment items as indicated.
- B. Casters: NSF-certified, standard-duty, stainless-steel, swivel stem casters with 5-inch- (125-mm-) diameter wheels, polyurethane tires with 1-inch (25-mm) tread width, and 200-lb (90-kg) load capacity per caster. Provide brakes on 2 casters per unit.

2.8 GENERAL FABRICATION

- A. Fabricate food service equipment according to NSF 2 requirements. Factory assemble equipment to greatest extent possible.
- B. Welding: Use welding rod of same composition as metal being welded. Use methods that minimize distortion and develop strength and corrosion resistance of base metal. Provide ductile welds free of mechanical imperfections such as gas holes, pits, or cracks.
 - 1. Welded Butt Joints: Provide full-penetration welds for full-joint length. Make joints flat, continuous, and homogenous with sheet metal without relying on straps under seams, filling in with solder, or spot welding.
 - 2. Grind exposed welded joints flush with adjoining material and polish to match adjoining surfaces.
 - 3. Where fasteners are welded to underside of equipment, finish reverse side of weld smooth and under-pressed.
 - 4. Coat unexposed stainless-steel welded joints with suitable metallic-based paint to prevent corrosion.
- C. Fabricate field-assembled equipment prepared for field-joining methods indicated. For metal butt joints, comply with referenced SMACNA standard, unless otherwise indicated.
- D. Form metal with break bends that are not flaky, scaly, or cracked in appearance; where breaks mar uniform surface appearance of material, remove marks by grinding, polishing, and finishing.
- E. Sheared Metal Edges: Finish free of burrs, fins, and irregular projections.
- F. Provide surfaces in food zone, as defined in NSF 2, free from exposed fasteners.
- G. Cap exposed fastener threads, including those inside cabinets, with stainless-steel lock washers and stainless-steel cap (acorn) nuts.
- H. Provide pipe slots on equipment with turned-up edges and sized to accommodate service and utility lines and mechanical connections.
- I. Provide enclosures, including panels, housings, and skirts, to conceal service lines, operating components, and mechanical and electrical devices including those inside cabinets, unless otherwise indicated.

2.9 STAINLESS STEEL EQUIPMENT

- A. Edges and Backsplashes: Provide equipment edges and backsplashes indicated complying with

referenced SMACNA standard, unless otherwise indicated.

- B. Apply sound dampening to underside of metal work surfaces, including sinks and similar units. Provide coating with smooth surface and hold coating 1 inch (25 mm) back from open edges for cleaning.

2.10 STAINLESS STEEL FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
 - 1. Remove or blend tool and die marks and stretch lines into finish.
 - 2. Grind and polish surfaces to produce uniform, directional textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
- B. Exposed Surfaces: No. 4 finish (bright, directional polish).
- C. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- D. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances, service-utility connections, and other conditions affecting installation and performance of food service equipment. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Examine roughing-in for piping, mechanical, and electrical systems to verify actual locations of connections before installation.

3.2 INSTALLATION, GENERAL

- A. Install food service equipment level and plumb, according to manufacturer's written instructions, original design, and referenced standards.
- B. Complete equipment field assembly, where required, using methods indicated.
 - 1. Provide closed butt and contact joints that do not require a filler.
 - 2. Grind field welds on stainless-steel equipment smooth, and polish to match adjacent finish. Comply with welding requirements in "Fabrication, General" Article.
- C. Install equipment with access and maintenance clearances according to manufacturer's written instructions and requirements of authorities having jurisdiction.
- D. Provide cutouts in equipment, neatly formed, where required to run service lines through equipment to make final connections.
- E. Except for mobile and adjustable-leg equipment, securely anchor and attach items and accessories to walls, floors, or bases with stainless-steel fasteners, unless otherwise indicated.
- F. Install trim strips and similar items requiring fasteners in a bed of sealant. Fasten with stainless-steel fasteners at 48 inches (1200 mm) o.c. maximum.
- G. Install sealant in joints between equipment and abutting surfaces with continuous joint backing, unless otherwise indicated. Provide airtight, watertight, vermin-proof, sanitary joints.

3.3 PROTECTING

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure food service equipment is without damage or deterioration at the time of Substantial Completion.

END OF SECTION

SECTION 11450 – COMMERCIAL LAUNDRY EQUIPMENT

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. This section includes **Contractor Furnished and Contractor Installed** commercial laundry service equipment.

1.3 SUBMITTALS

- A. Shop Drawings: Submit shop drawings as per requirements. Drawings shall show schedules showing location and sizes, and complete details.

1.4 GUARANTEE

- A. All equipment shall be guaranteed to be free from defects of workmanship of materials for a period of one year from date of acceptance.

PART 2 – MATERIALS

2.1 MANUFACTURERS

- A. Subject to requirements specified herein furnish products by one of the following:
 1. Unimac Laundry Equipment.
 2. ElectroLux Professional Line
 3. Maytag, Unimac
 4. Milnor

2.2 MATERIALS

- A. The following items shall be furnished by owner and installed by the contractor:
 1. Dryer
 - a. Drying Tumbler UT75 Series, by UniMac Laundry Equipment
 - b. 75 lb. basket capacity
 - c. 38.5" wide, 53" deep, 77" high
 - d. Standard Controls
 2. Washer:
 - a. UC Series HardMount Washer-Extractors, by UniMac Laundry Equipment
 - b. 34.1" wide, 22" deep, 49.9" high
 - c. 60 lb. capacity
 - d. Standard Controls
- B. Exposed finished surfaces shall be selected from manufactures standards.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Equipment shall be installed in strict accordance with manufacturer's recommendations.
- B. Owner's Manuals: Contractor shall insure that owner's manuals and other data packed with the equipment is turned over to the Owner's representative after installation is completed.

- C. Clean up: Contractor shall remove all packing, blocking, protective coatings and tapes after installation. Wash down exterior of units with mild detergent and water.

END OF SECTION

SECTION 11451 – APPLIANCES

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. This section includes:

- 1. **Contractor Furnished-Contractor Installed Equipment:**

- Where indicated on drawings, the Owner will furnish equipment items and the General Contractor shall install and make final electrical, mechanical and plumbing connections.

- 2. **Contractor Furnished-Contractor Installed Equipment:**

- Where indicated on drawings, the General Contractor will furnish equipment items and install and make final electrical, mechanical and plumbing connections.

1.3 SUBMITTALS

- A. Shop Drawings: Submit shop drawings as per requirements. Drawings shall show schedules showing location and sizes, and complete details.
- B. Owner's Manuals: Contractor shall insure that owner's manuals and other data packed with the equipment is turned over to the Owner's representative after installation is completed.

1.4 GUARANTEE

- A. All equipment shall be guaranteed to be free from defects of workmanship of materials for a period of one year from date of acceptance.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Contractor Furnished-Contractor Installed Equipment:

- 1. Refrigerator / Freezer:

- a. GE Model #GTE16GTHWW, 15.5.0 cu. ft. capacity, top freezer, frost free, energy star rated, 66" high, 28" wide, 31" deep

- 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.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Equipment shall be installed in strict accordance with manufacturer's recommendations.
- B. Clean up: Contractor shall remove all packing, blocking, protective coatings and tapes after installation. Wash down exterior of units with mild detergent and water.

END OF SECTION

SECTION 11500 - BASEBALL AND SOFTBALL ACCESSORIES

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 SECTION INCLUDES

- A. Provide all equipment and materials, and do all work necessary to furnish and install the athletic equipment, as indicated on the drawings and as specified herein. Athletic equipment shall include, but not be limited to:
 - 1. Tension Netting Systems (Baseball and Softball Backstop).
 - 2. Guardrail Systems and Padding (Dugouts).
 - 3. Foul Poles
 - 4. Windscreens
 - 5. Field Wall Padding (Baseball and Softball Backstops)
 - 6. Chain Link Fence Padding/Top Rail Padding.
 - 7. Team Player Benches (Dugouts).
 - 8. Bat and Helmet Storage Units (Dugouts).

1.3 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
 - 1. National Federation of State High School Associations (NFHS)
 - 2. National Collegiate Athletic Association (NCAA)
 - 3. International Association of Athletics Federations (IAAF)
 - 4. American Sports Builders Association (ASBA)
 - 5. Manufacturers Data and Recommended Installation Requirements

1.4 SUBMITTALS

- A. 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. Installation methods.
 - 4. Color chart.
 - 5. Samples - 18" x 18" of each type of netting.

1.5 SHOP DRAWINGS

- A. Provide drawings of the manufacturers recommended installation and foundation requirements prior to actual field installation work, for Architects or Owners representatives review.

1.6 QUALITY ASSURANCE

- A. Manufacturers warranties shall pass to the Owner and certification made that the product materials meet all applicable grade trademarks or conform to industry standards and inspection requirements. The Manufacturer shall have a current American Sports Builders Association (ASBA) Supplier Certificate of Distinction designation.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

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

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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 1. Sportsfield Specialties, Inc.(Basis of Design); P.O. Box 231, 41155 State Highway 10 Delhi, NY 13753
p. 888-975-3343; www.sportsfieldspecialties.com.
 2. Net Connection; 7355 Gadsden Highway Trussville, AL 35173; Ph. 205.508.5902;
www.netconnectionllc.com.
 3. Beacon Athletics; Forsythia Street, Suite 120: Middleton, WI 53562; Ph. 800.747.5985;
www.beaconathletics.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 TENSION NETTING SYSTEM (BASEBALL & SOFTBALL BACKSTOPS)

A. TNTBUC - Tie-Back Tension Ball Safety Netting System with Ultra Cross Netting and Accessories

1. Components:
 - a. Tie-Back Tension Ball Safety Netting System Upright Support Posts and Tie-Back Structures – Fabricated, Sized and Configured as Required.
 - i. Height Above Finish Grade as Required
 - ii. Powder Coated Finish (Various Colors Available) Color to be selected by Architect
 - iii. Ground Sleeve, Base Plate or Permanent Embedment Mount
 - iv. Hot Dipped Galvanized Assembly Hardware - Quantities, Sizes and Configurations as Required
 - b. Tie-Back Tension Ball Safety Netting System Wire Rope Support Structure:
 - i. Length, Height and Configuration as Required
 - ii. 6 x 25 IWRC Galvanized Wire Rope - 5/8" Diameter Main Horizontal Support, 37,000 lb. Minimum Breaking Strength, 12,333 lb. Minimum Working Load Limit
 - iii. 7 x 19 GAC Galvanized Aircraft Cable - 3/8" Diameter Tie-Back Support, 14,400 lb. Minimum Breaking Strength, 4,800 lb. Minimum Working Load Limit
 - iv. 7 x 19 GAC Galvanized Aircraft Cable - 1/4" Diameter Vertical and Bottom Horizontal Supports, 7,000 lb. Minimum Breaking Strength, 2,333 lb. Minimum Working Load Limit
 - v. Hot Dipped Galvanized Attachment and Assembly Hardware - Quantities, Sizes and Configurations as Required
 - c. Tie-Back Tension Ball Safety Netting System Net and Rope Bound Border:
 - i. Length, Height and Configuration as Required

- ii. Ultra Cross Knotless Netting
- iii. Dyneema® Ultra-High Molecular Weight Polyethylene (UHMWPE) SK-75 Black Fiber Construction
- iv. 4 Ply, 1.2 mm (0.0472") Diameter Twine
- v. 95% Open Mesh Area (See-Through Visibility)
- vi. 58,445 psi Minimum Breaking Strength
- vii. 30% Maximum Elongation at Break
- viii. 1-3/4" (44 mm) Square Mesh Size, 0.009 lbs. per Square Foot
- ix. 4-Strand, Braided, Continuous Monofilament Dyneema® Fiber
- x. Black Multi-Filament Polypropylene Solid Braid Derby Rope Sewn Binding on Perimeter Edges - 1/4" Diameter, 530 lb. Minimum Breaking Strength
- xi. Urethane Black Bonded Finish
- xii. Strong Resistance to Ultraviolet (UV) Light Degradation
- xiii. Excellent Resistance to Chemicals and Water Absorption

d. Included Accessories:

- i. Hot Dipped Galvanized Attachment and Assembly Hardware - Quantities, Sizes and Configurations as Required
- ii. Black Multi-Filament Polypropylene Solid Braid Derby Rope For Net Binding Attachment to Wire Rope Support Structure -1/4" Diameter, 530 lb. Minimum Breaking Strength – Quantities and Configurations as Required
- iii. Stamped and Sealed Drawings and Calculations by a Licensed Professional Engineer of Record in the State of Project Location

2. Installation:

- a. Tie-Back Tension Ball Safety Netting Systems with Ultra Cross Netting and Accessories shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings. Concrete anchoring foundations to be determined by others based on local soil conditions and building codes. Installer should have a minimum of five (5) ball safety netting system installations or similar experience in the previous three (3) years.

2.3 GUARD RAIL PADDING AND NETTING (DUGOUTS)

A. GRP STANDARD GUARD RAIL PADDING.

1. Components:

- a. Padding: GRP Standard Guard Rail Padding Protective Padding and Accessories
 - i. 18 oz. Per Square Yard EcoGuard® Extruded Vinyl Manufactured Using 33% Recycled Vinyl, High UV Resistance and Five (5) Year Limited Fade Warranty, Architect to select from Standard Colors Available
 - ii. Fabric: 1000 Denier Polyester Basic Fabric
 - iii. Tear Strength Test: Warp 78 lbs., Fill 65 lbs.
 - iv. Tensile Strength: Warp 224 lbs., Fill 220 lbs.
 - v. Weft Insertion: 9 x 9, Superior UV Inhibitors
 - vi. Cold Crack: Minus 20° Fahrenheit Vinyl Seams Double Stitched Using 6 lb. Bonded Polyester Black Thread

- vii. Standard Guard Rail Padding has 1" Thick Polyurethane Foam, Density: 1.7 – 1.9 lb./cu ft., Indention Load Deflection: 81 – 99 lbs., Tensile Strength: 20 psi Minimum, Elongation: 100% Minimum, Tear Strength: 1.50 lbs./LIN. Minimum
- viii. Two (2) – 1.5" Wide Vinyl Flaps with #2 Stainless Steel Grommets Factory Installed Every 6" on Center for Securement Purposes
- ix. Attached to Rail Using 14"L Nylon Zip Ties with a 50 lb. Break Strength by Others and Guard Rail Padding Includes Hook and Loop Attachment to Prevent Rotation
- x. Provide Custom Lettering and/or Graphics

2. Installation

- a. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel Anchoring devices to be provided by General Contractor as required for secure installation.

B. GUARD RAIL NETTING.

1. Components:

- a. Netting: BSSNUC Ultra Cross Knotless Dyneema UHMWPE Netting.
 - i. Length, Height and Configuration as Required
 - ii. Ultra Cross Knotless Netting
 - iii. Dyneema® Ultra-High Molecular Weight Polyethylene (UHMWPE) SK-75 Black Fiber Construction
 - iv. 4 Ply, 1.2 mm (0.0472") Diameter Twine
 - v. 95% Open Mesh Area (See-Through Visibility)
 - vi. 58,445 psi Minimum Breaking Strength
 - vii. 30% Maximum Elongation at Break
 - viii. 1-3/4" (44 mm) Square Mesh Size, 0.009 lbs. per Square Foot
 - ix. 4-Strand, Braided, Continuous Monofilament Dyneema® Fiber
 - x. Black Multi-Filament Polypropylene Solid Braid Derby Rope Sewn Binding on Perimeter Edges - 1/4" Diameter, 530 lb. Minimum Breaking Strength
 - xi. Urethane Black Bonded Finish
 - xii. Strong Resistance to Ultraviolet (UV) Light Degradation
 - xiii. Excellent Resistance to Chemicals and Water Absorption

2. Installation

- a. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel Anchoring devices to be provided by General Contractor as required for secure installation.

2.4 GUARD RAIL SYSTEMS (DUGOUTS)

A. GRS – GUARD RAIL SYSTEMS AND PADDING.

1. Components:

- a. Modularized Steel Structure:
 - i. 2" Square x 11 ga. Steel Galvanized Tubing
 - ii. 3'-6"H x Lengths as indicated on drawings.

- iii. Rails to include 18" vertical extension for in-ground embedment.
 - iv. Vertical post spacing to be equal spacing.
 - v. Powder Coated Black
- b. Netting: BSSNUC Ultra Cross Knotless Dyneema UHMWPE Netting.
- i. Length, Height and Configuration as Required
 - ii. Ultra Cross Knotless Netting
 - iii. Dyneema® Ultra-High Molecular Weight Polyethylene (UHMWPE) SK-75 Black Fiber Construction
 - iv. 4 Ply, 1.2 mm (0.0472") Diameter Twine
 - v. 95% Open Mesh Area (See-Through Visibility)
 - vi. 58,445 psi Minimum Breaking Strength
 - vii. 30% Maximum Elongation at Break
 - viii. 1-3/4" (44 mm) Square Mesh Size, 0.009 lbs. per Square Foot
 - ix. 4-Strand, Braided, Continuous Monofilament Dyneema® Fiber
 - x. Black Multi-Filament Polypropylene Solid Braid Derby Rope Sewn Binding on Perimeter Edges - 1/4" Diameter, 530 lb. Minimum Breaking Strength
 - xi. Urethane Black Bonded Finish
 - xii. Strong Resistance to Ultraviolet (UV) Light Degradation
 - xiii. Excellent Resistance to Chemicals and Water Absorption
- c. Padding: HIPROGRP High Profile Guard Rail Padding Protective Padding and Accessories
- i. 18 oz. Per Square Yard EcoGuard® Extruded Vinyl Manufactured Using 33% Recycled Vinyl, High UV Resistance and Five (5) Year Limited Fade Warranty, Architect to select from Standard Colors Available
 - ii. Fabric: 1000 Denier Polyester Basic Fabric
 - iii. Tear Strength Test: Warp 78 lbs., Fill 65 lbs.
 - iv. Tensile Strength: Warp 224 lbs., Fill 220 lbs.
 - v. Weft Insertion: 9 x 9, Superior UV Inhibitors
 - vi. Cold Crack: Minus 20° Fahrenheit
 - vii. Vinyl Seams Double Stitched Using 6 lb. Bonded Polyester Black Thread
 - viii. High Profile Guard Rail Padding has 1.25" Thick Closed Cell Cross-Link Foam, Density: 1.7 – 1.9 lb./cu ft., Indention Load Deflection: 81 – 99 lbs., Tensile Strength: 20 psi Minimum, Elongation: 100% Minimum, Tear Strength: 1.50 lbs./LIN. Minimum
 - ix. Two (2) – 1.5" Wide Vinyl Flaps with #2 Stainless Steel Grommets Factory Installed Every 6" on Center for Securement Purposes
 - x. Attached to Rail Using 14"L Nylon Zip Ties with a 50 lb. Break Strength by Others and High Profile Guard Rail Padding Includes Hook and Loop Attachment to Prevent Rotation
 - xi. Provide Custom Lettering and/or Graphics

2. Installation

- a. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel

Anchoring devices to be provided by General Contractor as required for secure installation.

2.5 FOUL POLES (BASEBALL & SOFTBALL)

A. SOFTBALL - FPW420 - 20ft Aluminum Foul Pole with Mesh Wing.

1. Components:
 - a. Foul Pole Fabricated with 4.0in OD x .125in Wall 6061 Aluminum Tube
 - i. 20.0ft Above Ground Height
 - ii. Powder Coated Yellow
 - b. Foul Pole Ground Sleeve Fabricated with 4.30in OD (4.10in ID) Aluminum Tube:
 - i. 4.0ft Length
 - ii. Aluminum Mill Finish
 - iii. Ground Sleeve Caps
 - c. Angled Wing Fabricated of .125in Aluminum:
 - i. Stamped Mesh, 1.50in x 1.50in Punchouts
 - ii. 18.0in Wide x 12.0ft Long
 - iii. Double Reinforced Bends, Welded at Corners
 - iv. Powder Coated Yellow
 - d. Accessories:
 - i. Stainless Steel Assembly Bolts and Nuts

2. Installation

- a. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings.

B. BASEBALL - FPW640 - 40ft Aluminum Foul Pole with Mesh Wing.

1. Components:
 - a. Foul Pole Fabricated with 6" Schedule 40 Steel Pipe - 6.625in OD x .280in Wall
 - i. 40.0ft Above Ground Height
 - ii. Super Durable Powder Coated Finish – Color to be selected by Architect from Manufacturers standard colors after Bid Date.
 - b. Foul Pole Ground Sleeve Fabricated with 7" in OD x .109" Wall Steel:
 - i. 4.0ft Length
 - ii. Alignment Bolt
 - iii. Welded Leveling Plate
 - iv. Ground Sleeve Caps
 - c. Angled Wing Fabricated of .125in Aluminum:
 - i. Stamped Mesh, 1.50in x 1.50in Punchouts
 - ii. 18.0in Wide x 32.0ft Long
 - iii. Double Reinforced Bends, Welded at Corners
 - iv. Powder Coated Finish – Color to be selected by Architect from Manufacturers standard colors after Bid Date
 - d. Accessories:

- i. Stainless Steel Assembly Bolts and Nuts
2. Installation
- a. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings.

2.6 WINDSCREEN

A. VCP – WINDSCREEN

- 1. Components:
 - a. VCPDG - Windscreen with Digitally Printed Graphics:
 - i. Vinyl Coated Polyester Mesh (VCP/VCM) 9 x 12
 - ii. Base Fabric: 9 x 12 1000 Denier Polyester
 - iii. Weight (Test Method 5041): Eight Ounces (8 oz.) Per Square Yard, Plus or Minus One Ounce (1 oz.)
 - iv. Eighty Percent (80%) Closed Mesh, Twenty Percent (20%) Open
 - v. Heights: As Required; Standard Six Feet (6'), Standard Nine Feet (9'), Custom to Nine Feet ($\leq 9'$)
 - vi. Tensile Strength (Test Method 5100-Warp x Fill): 210 x 220lbs.
 - vii. Adhesion (Test Method 5970-Warp x Fill): 8 x 8 lbs./2"
 - viii. Tear Strength (Test Method 5134-Warp x Fill): 90 x 90 lbs.
 - ix. Heat Welded Perimeter Hem with 30mm PVC-Coated Weldable Webbing Reinforcement Tape (Tensile Strength: 1650 lbs.)
 - x. #2 Brass Grommets Inserted in Perimeter Hem Every Twelve Inches (12") On-Center and Corners for Attachment Purposes
 - xi. Weather, Ultraviolet (UV), Rot, Mildew and Flame Resistant
 - xii. Standard Colors: Black, Green, Royal Blue, Navy Blue, Red, Burgundy, Purple and Yellow
 - xiii. Standard Three (3) Year Limited Product Warranty
 - xiv. Custom High Resolution Digitally Printed Graphics (Hand Applied Graphics Unacceptable)
 - 1) Vector Artwork to be Provided by Owner
 - 2) Renderings to be Generated for Owner Approval

2.7 FIELD WALL PADDING (BACKSTOP)

A. PWPZ – BaseZone Field Wall Padding and Accessories.

- 1. Components:
 - a. BaseZone® Field Wall Padding:
 - i. 3" Thick High Impact Polyurethane Foam
 - ii. 5/8" Square Edge AdvanTech® Water Resistant Sheathing Panel, All Sides Stained and Sealed with Exterior Grade Finish
 - iii. 18 oz. Per Square Yard EcoGuard® Extruded Vinyl Manufactured Using 33% Recycled Vinyl, High UV Resistance and Five (5) Year Limited Fade Warranty, Various Standard Colors Available
 - iv. Fabric: 1000 Denier Polyester Basic Fabric
 - v. Tear Strength Test: Warp 78 lbs., Fill 65 lbs.

- vi. Tensile Strength: Warp 224 lbs., Fill 220 lbs.
- vii. Weft Insertion: 9 x 9, Superior UV Inhibitors
- viii. Cold Crack: Minus 20° Fahrenheit
- ix. Vinyl Seams Double Stitched Using 6 lb. Bonded Polyester Black Thread
- x. Stainless Steel Assembly Hardware
- xi. Standard Concrete Wall with Z-Clip and/or Chain Link with Bolt and Plate Attachment Methods Available
- xii. Provide Optional Sewn Pad Version with Grommet Flap Attachment
- xiii. Optional Patented deltaF® Four-Way Stretch Vinyl Perimeter to Prevent Wrinkles in the Vinyl Due to Varying Thermal Expansion and Contraction Rates of the Foam Padding
- xiv. Provide Optional Custom Lettering and/or Graphics

2. Installation

- a. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel Anchoring devices to be provided by General Contractor as required for secure installation.

B. PFWPZ – ProZone Premium Field Wall Padding and Accessories.

1. Components:

a. ProZone® Premium Field Wall Padding:

- i. High Performance 3" Dual-Density Foam Design: 2" Cross-Linked Polyethylene (XPE) Closed Cell Foam & 1" 1690 Polyurethane Foam (Field-Side)
 - 1) Designed to Provide Soft "Feel" Upon Mild Contact while Safely Absorbing Maximum Impact Velocities
 - 2) Non-Hygroscopic, Closed Cell Foam Limits Water Absorption
 - 3) Superior Resilience at High Impacts and Multi-Strike Energy Management
- ii. 3/4" Square Edge AdvanTech® Water Resistant Sheathing Panel; All Sides Stained and Sealed with Exterior Grade Finish
- iii. High UV Resistant 25 oz./yd² Extruded Vinyl:
 - 1) 5-Year Limited Fade Warranty
 - 2) Total Weight: 25 oz./yd² (ASTM D3776)
 - 3) Composition: 89% Vinyl Coating, 11% Polyester Fabric (ASTM D751)
 - 4) Trapezoid Tear: Warp 85 lbs., Fill 64 lbs. (ASTM D751)
 - 5) Grab Tensile: Warp 249 lbs., Fill 235 lbs. (ASTM D751)
 - 6) Cold Crack (1/8" Mandrel): -49°F (ASTM D2136)
 - 7) Abrasion (H18, 1000 gm load): > 1000 Cycles (ASTM D3389-94)
 - 8) Rot, Mildew and Fungus Resistant
- iv. Stainless Steel Staples and Applicable Hardware
- v. Wall Mounting Hardware:
 - 1) Aluminum Z-Clip Wall Mounting Hardware or Bolt and Back-up Plate Chain Link Fence Attachment Hardware
- vi. Impact Testing; Independently Certified:

- 1) ASTM F2440; 10 lb. x 6.3" Dia. Hemisphere Head Form, 4' Drop Height (Impact Velocity: 10.9 MPH):
 - a) G-max: 55
 - b) Head Injury Criterion (HIC): 159
- 2) Head Injury Criterion (HIC) Impact Test: 10 lb. x 6.3" Dia. Hemisphere Head Form, 5' Drop Height (Impact Velocity: 12.2 MPH):
 - a) G-max: 68
 - b) Head Injury Criterion (HIC): 250
- 3) Head Injury Criterion (HIC) Impact Test: 10 lb. x 6.3" Dia. Hemisphere Head Form, 9' Drop Height (Impact Velocity: 16.4 MPH):
 - a) G-max: 139
 - b) Head Injury Criterion (HIC): 950
- vii. 5-Year Manufacturer's Limited Product Warranty
- viii. Optional:
 - 1) Custom High-Resolution Digitally Printed Graphics
 - 2) deltaF® Anti-Wrinkle Technology
 - a) Four-Way Stretch Vinyl Perimeter to Prevent Wrinkles in the Vinyl Due to Varying Thermal Expansion and Contraction Rates of the Foam Padding

2. Installation

- a. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel Anchoring devices to be provided by General Contractor as required for secure installation.

2.8 CHAIN LINK FENCE PADDING

A. BCLTRP – Chain Link Top Rail Protective Padding and Accessories.

1. Components:
 - a. Chain Link Top Rail:
 - i. 18 oz. Per Square Yard EcoGuard® Extruded Vinyl Manufactured Using 33% Reprocessed Vinyl, High UV Resistance and Five (5) Year Limited Fade Warranty, Various Standard Colors Available
 - ii. Fabric: 1000 Denier Polyester Basic Fabric
 - iii. Tear Strength Test: Warp 78 lbs., Fill 65 lbs.
 - iv. Tensile Strength: Warp 224 lbs., Fill 220 lbs.
 - v. Weft Insertion: 9 x 9, Superior UV Inhibitors
 - vi. Cold Crack: Minus 20° Fahrenheit
 - vii. Vinyl Seams Double Stitched Using 6 lb. Bonded Polyester Black Thread
 - viii. 3" Thick High Impact Polyurethane Foam
 - ix. Two (2) – 1.5" Wide Vinyl Flaps with #2 Stainless Steel Grommets Factory Installed Every 12" on Center for Securement Purposes
 - x. Attached to Rail Using 14"L Nylon Zip Ties with a 50 lb. Break Strength by Others
 - xi. Provide Custom Lettering and/or Graphics

2. Installation

- a. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel Anchoring devices to be provided by General Contractor as required for secure installation.

2.9 TEAM PLAYER BENCHES (DUGGOUT)

A. PTBTTWM – Wall Mounted Two Tier Polyboard Team Bench.

1. Components:

- a. Wall Mounted Two Tier Polyboard Team Bench
- i. Standard Lengths: 8 ft., 10 ft., 12 ft., or 15 ft.
 - ii. Fully Welded Frame Fabricated with 1/8" (0.125") Formed Aluminum and 2" x 2" x 1/8" (0.125") Square Aluminum Tubing
 - 1) Durable Powder Coated Finish
 - 2) Weather Resistant and Unsusceptible to Rust
 - 3) Architect to choose from Standard Color Options
 - iii. 2" x 4" and 2" x 6" Synthetic Polyboard Seat and Backrest Planking Material
 - 1) Durable and Wear Resistant Solid Core Construction
 - 2) Guaranteed Not to Crack, Splinter, or Sliver
 - 3) Manufactured From 90% Recycled Post Consumer Plastic
 - 4) Architect to choose from Standard Color Options
 - iv. 100% Preassembled; On-Site Assembly NOT Required
 - v. Two Tier Design Permits Player Seating on Bench or Upper Shelf
 - vi. Includes Mounting Brackets and Concrete Wedge Anchors for Wall Mounting (Applications Will Vary; Alternative Wall Fasteners Not Included)
 - vii. 5-Year Manufacturer's Limited Product Warranty

2. Installation

- a. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel Anchoring devices to be provided by General Contractor as required for secure installation.

B. PTBBRSP – Surface Mounted Polyboard Team Bench with Back Rest.

1. Components:

- a. Polyboard Team Bench with Back Rest:
- i. Standard Lengths: 8 ft., 10 ft., 12 ft., or 15 ft.
 - ii. Fully Welded Frame Fabricated with 2" x 2" x 1/8" (0.125") Square Aluminum Tubing
 - 1) Durable Powder Coated Finish
 - 2) Weather Resistant and Unsusceptible to Rust
 - 3) Architect to choose from Standard Color Options
 - iii. 2" x 4" and 2" x 6" Synthetic Polyboard Seat and Backrest Planking Material
 - 1) Durable and Wear Resistant Solid Core Construction
 - 2) Guaranteed Not to Crack, Splinter, or Sliver

- 3) Manufactured From 90% Recycled Post Consumer Plastic
- 4) Architect to choose from Standard Color Options
- iv. 100% Preassembled; On-Site Assembly NOT Required
- v. Includes Concrete Wedge Anchors for Surface Mounting to Concrete Floor/Slab
- vi. 5-Year Manufacturer's Limited Product Warranty

2. Installation

- a. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel Anchoring devices to be provided by General Contractor as required for secure installation.

C. Surface Mounted Aluminum Players Bench with Shelf.

- 1. Manufacturer: Outdoor Aluminum | P.O. Box 118 | Geneva, Alabama 36340 | Ph.: 1.800.225.4249 | www.outdooraluminum.com.
- 2. Components:
 - a. PBS - Aluminum Players Bench with Shelf:
 - i. Standard Lengths: 7.5 ft., 15 ft., 21 ft., or 27 ft.
 - ii. Players bench with a 2x10 clear anodized seat plank, backrest and a double 2x10 shelf mounted to a unique all aluminum angle frame.
 - iii. Includes Concrete Wedge Anchors for Surface Mounting to Concrete Floor/Slab

3. Installation

- b. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel Anchoring devices to be provided by General Contractor as required for secure installation.

2.10 BAT AND HELMET STORAGE UNITS (DUGGOUT)

A. SUAHCBBSS – Aluminum Storage Unit with Helmet Cubby, Bat Bin and Side Storage.

- 1. Components:
 - a. Pre-Assembled All-Weather Aluminum Bat, Helmet and Storage Cubby Unit:
 - i. Overall Dimensions: 7'-6"H x 4'W x 3'-5/16"D
 - ii. Constructed with Formed .090" 5052 Aluminum Sheet and Stainless Steel Domed Rivets
 - iii. Durable Powder Coated Finish
 - 1) Weather Resistant and Unsusceptible to Rust
 - 2) Architect to choose from Standard Color Options
 - iv. Helmet Cubbies: Sixteen (16) 10-3/8" x 10-3/8" x 18"D
 - v. Bat Bins: Eight (8) 10-3/8" x 10-3/8" x +/- 3'D
 - vi. Side Storage: Lockable Access Doors with Recessed Pull Handle
 - vii. Bolt-on Powder Coated Steel Understructure Assembly with 1/2" Galvanized Steel Wedge Anchors for Optional Surface Mounting to Concrete Slab
 - viii. 5-Year Manufacturer's Limited Product Warranty

2. Installation

- a. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel

Anchoring devices to be provided by General Contractor as required for secure installation.

B. SUABBSS – Aluminum Bass Unit; Bat Bins and Side Storage.

1. Components:

- a. Pre-Assembled All-Weather Aluminum Bass Unit; Bat Bins and Side Storage.
 - i. Overall Dimensions: 3'-6"H x 4'W x 3'-5/16"D
 - ii. Constructed with Formed .090" 5052 Aluminum Sheet and Stainless Steel Domed Rivets
 - iii. Durable Powder Coated Finish
 - 1) Weather Resistant and Unsusceptible to Rust
 - 2) Choose From Various Standard Color Options
 - iv. Bat Bins: Eight (8) 10-3/8" x 10-3/8" x +/- 3'D
 - v. Side Storage: Lockable Access Doors with Recessed Pull Handle
 - vi. Bolt-on Powder Coated Steel Understructure Assembly with 1/2" Galvanized Steel Wedge Anchors for Optional Surface Mounting to Concrete Slab
 - vii. 5-Year Manufacturer's Limited Product Warranty

2. Installation

- a. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel Anchoring devices to be provided by General Contractor as required for secure installation.

C. SUAHCWM/SUACRSWM – Aluminum Wall Mounted Helmet Cubby and Coat Rack.

1. Components:

- a. **SUAHCWM** - Pre-Assembled All-Weather Aluminum Wall Mount Helmet Cubby Unit:
 - i. Overall Dimensions: 1'-3/4"H x 4'L x 1'-4-3/16"D
 - ii. Constructed with Formed .090" 5052 Aluminum Sheet and Stainless Steel Domed Rivets
 - iii. Durable Powder Coated Finish
 - 1) Weather Resistant and Unsusceptible to Rust
 - 2) Architect shall choose color after bid date from Standard Color Options
 - iv. Helmet Cubbies: Four (4) 10-3/4" x 10-3/4" x 16"D
 - v. Combine Multiple Units to Desired Overall Length
 - vi. Wall Mounting Hardware Not Included (Varies by Application)
 - vii. 5-Year Manufacturer's Limited Product Warranty
- b. **SUACRSWM** - Pre-Assembled All-Weather Aluminum Wall Mount Coat Rack and Shelf Unit:
 - i. Overall Dimensions: 13-1/16"H x 48"L x 16-1/16"D
 - ii. Constructed with Formed .090" 5052 Aluminum Sheet and Stainless Steel Domed Rivets
 - iii. Durable Powder Coated Finish
 - 1) Weather Resistant and Unsusceptible to Rust
 - 2) Architect shall choose color after bid date from Standard Color Options

- iv. Metal Coat and Hat Hooks Spaced 12" On-Center.
- v. Combine Multiple Units to Desired Overall Length
- vi. Wall Mounting Hardware Not Included (Varies by Application)
- vii. 5-Year Manufacturer's Limited Product Warranty

2. Installation

- a. The Wall Mounted Helmet Cubby Unit (SUAHCWM) must be mounted on top of the Wall Mounted Coat Rack Unit (SUACRSWM) to form one functional unit.
- b. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel Anchoring devices to be provided by General Contractor as required for secure installation.

D. SUAHCWM/SUACRSWM – Aluminum Wall Mounted Coat Rack and Shelf.

1. Components:

- a. **SUACRSWM** - Pre-Assembled All-Weather Aluminum Wall Mount Coat Rack and Shelf Unit:
 - i. Overall Dimensions: 13-1/16"H x 48"L x 16-1/16"D
 - ii. Constructed with Formed .090" 5052 Aluminum Sheet and Stainless Steel Domed Rivets
 - iii. Durable Powder Coated Finish
 - 1) Weather Resistant and Unsusceptible to Rust
 - 2) Architect shall choose color after bid date from Standard Color Options
 - iv. Metal Coat and Hat Hooks Spaced 12" On-Center.
 - v. Combine Multiple Units to Desired Overall Length
 - vi. Wall Mounting Hardware Not Included (Varies by Application)
 - vii. 5-Year Manufacturer's Limited Product Warranty

2. Installation

- a. The Wall Mounted Helmet Cubby Unit (SUAHCWM) must be mounted on top of the Wall Mounted Coat Rack Unit (SUACRSWM) to form one functional unit.
- b. All athletic equipment shall be installed as recommended with manufacturer's written directions, and as indicated on the drawings. All Galvanized Steel or Stainless Steel Anchoring devices to be provided by General Contractor as required for secure installation.

2.11 BASES, PLATES AND PITCHING RUBBERS – SYNTHETIC TURF

A. TBS – TurfBase Set.

1. Components: TBS - TurfBase® Set

- a. Durable Rubber Mesh Reinforced Construction
- b. Specifically Designed Molded Pegs Embed in Synthetic Turf Infill Material Preventing Horizontal Movement with No Ground Anchor Necessary in Synthetic Infill Turf Applications
- c. Official Size 15" x 15" x 3" Bases
- d. Set of Three (3)
- e. Color: White/Off-White
- f. Bases shall be installed as recommended per manufacturer's written instructions and as

indicated on the drawings.

B. TBHP – TurfBase Home Plate.

1. Components: TBHP - TurfBase® Home Plate
 - a. Durable Rubber Mesh Reinforced Construction
 - b. Specifically Designed Molded Pegs Embed in Synthetic Turf Infill Material Preventing Horizontal Movement with No Ground Anchor Necessary in Synthetic Infill Turf Applications
 - c. Official Size and Shape
 - d. Color: White/Off-White
 - e. Plates shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings.

C. TBHP – TurfBase Pitching Rubber.

1. Components: TBPR - TurfBase® Pitching Rubber
 - a. Durable Rubber Mesh Reinforced Construction
 - b. Specifically Designed Molded Pegs Embed in Synthetic Turf Infill Material Limiting Horizontal Movement in Synthetic Infill Turf Applications
 - c. Size: 6" x 24"
 - d. Color: White/Off-White
 - f. Pitching Rubbers shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings.

2.12 BASES, PLATES AND PITCHING RUBBERS – NATURAL TURF

A. SHIBL – Schutt Hollywood Impact Bases Set.

1. Components: Schutt Hollywood Impact Bases Set
 - a. Premium Professional Construction with Patented Chevron Design
 - b. Advanced Design Compresses Upon Impact
 - c. Regulation Size 15" x 15" x 2 ½" Bases
 - d. Includes 6" Base Stanchions
 - e. Set of Three (3)
 - f. Bases shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings.

B. SHBBP-44 – Schutt Ground Anchor Mounts including Plugs.

1. Components: SHBBP-44 – Schutt Ground Anchor Mounts
 - a. Eight Inch (8") Female Ground Anchors
 - b. Set of Three (3)
 - c. 1 ¾" Square
 - d. Contractor to include Schutt Digout Tool to easily clean out ground anchors.
 - e. Anchors shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings.

C. SH12916590 – Schutt Foam Anchor Plugs with indicator.

1. Components: SH12916590 – Schutt Foam Anchor Plugs with indicator
 - a. Provide One plug for every ground anchor mount.

D. SHP-UM – Schutt Hollywood MLB Pro Style Universal Home Plate.

1. Components: SHP-UM – Schutt Hollywood MLB Pro Style Universal Home Plate
 - a. High Durability Molded Rubber Construction
 - b. Official size
 - c. 1 ½” Thick
 - d. Includes Seven Inch (7”) Stanchion
 - e. Includes One (1) Ground Anchor and One (1) Anchor Plug
 - f. Includes Five (5) Zinc-Plated Mounting Spikes
 - g. Anchors and Plate shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings.

E. SHBBPB – Schutt Hollywood 4 Sided Professional Pitching Rubber.

1. Components: Schutt Hollywood 4 Sided Professional Pitching Rubber
 - a. Ultra-Durable Molded Rubber Construction around an Aluminum Cylindrical Tube Lining to be filled with Dirt or Concrete in the field for added strength and stability.
 - b. Size: Official Size 24” Long x 6” Wide x Four (4) Sided Professional Pitching Rubber
 - c. Designed to be rotated in the playing surface for continual use and longevity.
 - d. Pitching Rubbers shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings.

PART 3 - EXECUTION

3.1 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.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in conformance with manufacturer's recommendations. Provide installation that is complete and to the standards required by League rules.

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 12304 - LAMINATE CLAD CASEWORK

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 WORK INCLUDED

- A. The extent of laminate clad casework as shown on the drawings.
- B. The work includes the fabrication and installation of laminate clad casework components of base cabinets, wall cabinets, tall cabinets, shelf units, cubbies and related countertops and other units as indicated.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. Sinks and Service Fixtures: Furnished and installed under Mechanical and Electrical Divisions 15 and 16.
- B. Base Molding: Furnished and installed under Finishes Division 9.

1.4 QUALITY ASSURANCE

- A. Provide laminate clad casework and countertops furnished by the same supplier for single responsibility and integration with other building trades.
- B. Manufacturers shall show evidence of at least five (5) years experience and installations for similar types of projects.
- C. Millwork must conform to design quality of materials, workmanship and function of casework specified and shown on drawings.

1.5 SUBMITTALS

- A. Product Data: In addition to the general conditions as relates to prior approvals, submittals of manufacturer's data, installation instructions and samples are required upon architect's request.
- B. Samples:
 - 1. Submit 2, 2" x 3" samples of casework manufacturer's standard decorative laminate colors, patterns and textures for exposed and semi-exposed materials for architect's selection.
 - 2. Samples will be reviewed by architect for color, texture, and pattern only. Compliance with other specified requirements is the exclusive responsibility of the contractor.
 - 3. Submit one full-size sample base cabinet unit with hardware, doors and drawers, without countertop.
 - 4. Submit one full-size sample wall cabinet unit complete with hardware, doors, and adjustable shelves.
 - 5. Acceptable sample units will be used for comparison inspections at the project. Unless otherwise directed, acceptable sample units may be incorporated in the work. Notify architect of their exact locations. If not incorporated in the work, retain acceptable sample units in the building until completion and acceptance of the work.
 - 6. Remove sample units from the premises when directed by the architect.
- C. Shop Drawings:
 - 1. Submit shop drawings for laminate clad casework and counter-tops showing layout, elevations, ends, cross-sections, service run spaces, and location of services. Show details and location of anchorages.
 - 2. Include layout of units with relation to surrounding walls, doors, windows, and other building components.

3. Coordinate shop drawings with other work involved.

1.6 PRODUCT HANDLING

- A. Deliver laminate clad casework and countertops only after wet operations in building are completed.
- B. Store completed laminate clad casework and countertops in a ventilated place, protected from the weather, with relative humidity range of 20% to 50%.
- C. Protect finished surfaces from soiling and damage during handling and installation. Keep covered with a protective covering.

1.7 JOB CONDITIONS

- A. Humidity and Temperature Controls:
 - 1. Advise contractor of requirements for maintaining heating, cooling and ventilation in installation areas as required to reach relative humidity necessary to maintain optimum moisture content.

1.8 WARRANTY

- A. All materials and workmanship covered by the section will carry a one (1) year warranty from date of acceptance.

PART 2 - PRODUCTS

2.1 MANUFACTURERES

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function:
 - 1. TMI Systems - Dickson, N.D.
 - 2. Case Systems- Midland, MI.
 - 3. L.S.I.
 - 4. Stevens Industries - Teutopolis, IL.
 - 5. Cabinets by Design, LLC; 770.418.1200
 - 6. PR Bean Company, LLC; 812.254.3761
 - 7. Advanced Cabinet Systems (ACS); 765.677.8000
 - 8. Varner Woodworks, Montgomery, AL.

2.2 MATERIALS

- A. Definitions: Identification of casework parts by surface visibility.
 - 1. Unit Body Open Interiors: Any storage unit surface without solid door or drawer fronts and units with glass sliding or glass framed doors.
 - 2. Unit Body Closed Interiors: Any storage unit surface behind solid door or drawer fronts.
 - 3. Unit Body Exposed Side: Any storage unit exterior side surface is visible.
 - 4. Concealed Surfaces: Any surface not normally visible after installation.

2.3 CORE MATERIALS

- A. Particleboard: Minimum density 45 lb. western particleboard of fir or pine meeting or exceeding ANSI A 208 1-1979, 1-M-3 requirements. Thickness used are 1/4", 1/2", 3/4" and 1". (Thickness of particleboard excluding skins).
- B. Hardboard: Prefinished hardboard in 1/4" thickness meeting or exceeding commercial standards CS-251.
- C. Plywood: Shall be 9-ply hardwood plywood.

2.4 DECORATIVE LAMINATES

- A. High pressure decorative laminate GP50 (.050), NEMA Test LD-3 - 1985.
- B. High pressure decorative laminate GP38 (.038), NEMA Test LD-3 - 1985.
- C. High pressure decorative laminate GP28 (.028), NEMA Test LD-3 - 1985. Laminate shall be counter balanced.
- D. High pressure decorative laminate PF42 (.042), NEMA Test LD-3 - 1985.
- E. High pressure decorative laminate PF30 (.030), NEMA Test LD-3 - 1985
- F. High Pressure cabinet liner CL20 (.020), NEMA Test LD-3 - 1985.
- G. Laminate shall be counter balanced.
- H. Melamine laminate tested to meet NEMA Test LD-3 - 1985. Laminate shall be counter balanced.
- I. High pressure backer BK20 (.020). Laminate shall be counter balanced.
- J. Laminate Color Selection(s):
 - 1. Colors for countertop grades GP50, GP38, PF42 and PF30 shall be selected from Wilsonart's standard solid and pattern offering. A maximum of five (5) colors per project.
 - 2. Colors for cabinet surfaces grade GP28 shall be selected from Wilsonart's standard solid and pattern offering. A maximum of one (1) color to be selected per unit face and five (5) colors per project.
 - 3. Melamine colors shall be light beige or dove grey. One color only per project.
 - 4. Colors: To be selected by architect after bid date / during submittal phase of project.

2.5 PLASTIC EDGING

- A. 1mm PVC hot melt glue applied.
- B. 3mm PVC hot melt glue applied.

2.6 METAL PARTS

- A. Countertop support brackets, legs and miscellaneous metal parts shall be furniture steel, welded, degreased, cleaned, treated and powder painted in light beige, sienna brown, dove grey or black colors.

2.7 CABINETS HARDWARE

- A. Hinges: Shall be five knuckle, 2-3/4 inch, overlay type, hospital tip, .095 inch thick steel. Hinges shall have a minimum of eight (8) edge and leaf fastenings. Doors 48 inches and over in height shall have three (3) hinges per door. Available in light beige, sienna brown, dove grey, black colors, or brushed chrome finish. Magnetic door catches are required with this hinge and shall be magnetic type with a minimum ten (10) pound pull, attached with screws and slotted for adjustment.
- B. Pulls: Door and drawer fronts shall be a semi-flush ABS plastic recessed and fastened with glue and screws. Available in light beige, sienna brown, dove grey or black colors.
- C. Drawer Slides: Shall be Blum bottom mount style No. BS 230E with epoxy finish. Slides will have a 100 pound load rating at full extension and a built-in, positive stop both directions. Slides shall have a life time warranty as offered by the slide manufacturer.
- D. Adjustable Shelf Supports: Shall be heavy-duty to support two hundred (200) pounds, self-locking nylon, to fit 32mm pre-drilled holes in cabinet ends and vertical partitions. The self supports shall have two (2) pins 5mm in diameter, to prevent the shelf support from rotating and tipping. Available for 3/4 inch or 1 inch thick shelves.
- E. Locks:
 - 1. Door and Drawer Locks: Shall be National Lock #M4-7054C, removable core, disc tumbler, cam style lock with strike. Each lock shall be furnished with two (2) keys.

2. Locks for sliding 3/4" doors shall be disc type plunger lock, sliding door type with strike locks for sliding glass doors shall be a ratchet type sliding showcase lock. Install locks on all teacher's cabinets.
 3. Chain bolts shall be 3 inches long, shall have a 18 inch pull and an angle strike to secure inactive door on cabinets over 72 inches in height. Elbow catches shall be used on inactive doors up to and including 72 inches in height.
- F. Coat Rods: Shall be 1-1/4 inch, 14 gauge chrome plated steel.
- G. Mirrors: Shall be 1/4 inch thick polished mirror plate.
- H. Computer Grommets: Shall be 2 1/2 inch dia. plastic insert and cover to be located at each computer station.

2.8 FABRICATION

- A. Fabricate laminate clad casework to dimensions, profiles and details shown.
- B. Cabinet Joinery: Tops and bottoms shall be joined to cabinet ends using a minimum of six (6) dowels at each joint for twenty- four (24) inch deep cabinets and a minimum of four (4) dowels at each joint for twelve (12) inch deep cabinets. All dowels are to be industrial grade hardwood laterally fluted, with chamfered ends and a minimum diameter of ten (10) millimeters. Internal cabinet components such as fixed horizontals, rails and verticals are to be doweled in place. Dowels are to be securely glued and cabinets clamped under pressure during assembly to assure secure joints and cabinets and squareness.
- C. Unit Door and Drawer Fronts:
1. Shall be 3/4 inch thick particleboard and laminate with high pressure decorative laminate GP28 color as selected on the exposed surface and high pressure laminate cabinet liner CL20 on the interior surface light beige or dove grey color.
 2. All edges shall be finished with 3mm PVC in light beige, sienna brown, dove grey or black color.
 3. Framed glass insert doors shall be 1/4 inch thick plate glass trimmed with extruded PVC plastic in light beige, sienna brown, dove grey or black color only.
 4. Double doors shall be used on all cabinets in excess of 24 inches in width.
- D. Unit Body Open Interiors:
1. Exposed cabinet sides shall be 3/4 inch thick particleboard laminated on the exterior with high pressure decorative laminate GP28 in color as selected and balanced with high pressure cabinet liner CL20 in light beige or dove grey color. The front edge shall be edgebanded with 1mm PVC to match the door and drawer front edge color.
 2. Unexposed cabinet sides shall be 3/4 inch thick particleboard laminated both sides with melamine in light beige or dove grey color. The front edge shall be edgebanded with 1mm PVC to match the door and drawer front edge color.
 3. Unit top or subtop shall be 3/4 inch thick particleboard laminated both sides with melamine and front edge with 1mm PVC to match the door and drawer front edge color. All subtops shall be full depth.
 4. Bottom of base and wardrobe units shall be 3/4 inch thick particleboard laminated both sides with melamine and front edged with 1mm PVC to match the door and drawer front edge color.
 5. Fixed intermediates shall be 3/4 inch thick particleboard laminated both sides with melamine and front edged with 1mm PVC to match the door and drawer front edge color. An intermediate will be provided on all units over 36 inches wide.
 6. Standard unit backs shall be 1/2 inch thick prefinished particleboard. Color to match interior. Exposed back on fixed or movable cabinet to be 3/4 inch thick particleboard laminated with CL20 on the interior to match melamine color and GP28 on the exterior as selected.

7. Adjustable shelves shall be 3/4 inch thick particleboard up to 30 inches wide and 1 inch thick particleboard over 30 inches wide, laminated both sides with melamine in light beige or dove grey color.
8. Shelves shall be edged front edge only with 1mm PVC to match the self color.

E. Unit Body Closed Interiors:

1. Exposed cabinet sides shall be 3/4 inch thick particleboard laminated on the exterior with high pressure decorative laminate GP28 in color as selected and balanced with high pressure cabinet liner CL20 in light beige or dove grey color. The front edge shall be edgebanded with 1mm PVC to match the door and drawer front edge color.
2. Unexposed cabinet sides shall be 3/4 inch thick particleboard laminated both sides with melamine in light beige or dove grey color. The front edge shall be edgebanded with 1mm PVC to match the door and drawer front edge color.
3. Unit top or subtop shall be 3/4 inch thick particleboard laminated both sides with melamine and front edged with 1mm PVC to match the door and drawer front edge color. All sub- tops shall be full depth. Sink base units shall have a 1 inch x 1 inch x 1/8 inch angle iron rail in lieu of full sub- top.
4. Bottom of base and wardrobe units shall be 3/4 inch thick particleboard laminated both sides with melamine and front edges with 1mm PVC to match the door and drawer front edge color. Sink cabinet bottoms shall be laminated both sides with CL20.
5. Fixed intermediates shall be 3/4 inch thick particleboard laminated both sides with melamine and front edged with 1mm PVC to match the door and drawer front edge color. An intermediate will be provided on all units over 36 inches wide.
6. Standard unit backs shall be 1/2 inch thick prefinished particleboard. Color to match interior. Exposed back on fixed or movable cabinet to be 3/4 inch thick particleboard laminated with CL20 on the interior to match melamine color and GP28 on the exterior as selected.
7. Adjustable shelves shall be 3/4 inch thick particleboard up to 30 inches wide and 1 inch thick particleboard over 30 inches wide, laminated both sides with melamine in light beige or dove grey color.
8. Shelves shall be edged front edge only with 1mm PVC to match the shelf color.

F. Wall Unit Bottom:

1. For units with open interiors shall be 3/4 inch thick particleboard laminated both sides with melamine laminate in light beige or dove grey color.
2. For units with closed interiors shall be 3/4 inch thick particleboard laminated both sides with melamine laminate in light beige or dove grey color.
3. The front edge shall be edgebanded with 1mm PVC to match the door and drawer front edge color. The exposed bottom edge of each wall cabinet side shall be edgebanded with 1mm PVC.

G. Drawers:

1. Sides, back and sub-front shall be particleboard, 1/2 inch thick, laminated with melamine in light beige or dove grey color. The back and sub-front are dowelled and glued into sides. Dowels shall be fluted, with chamfered ends and a minimum diameter of eight (8) millimeters. To edge is banded with 1mm PVC edging in a matching color.
2. Drawer bottom shall be 1/2 inch thick prefinished particle- board with color to be light beige or dove grey, screwed directly to the bottom edges of the drawer box.
3. Paper storage drawers are of heavy-duty 3/4 inch particle- board laminated both sides with melamine color to be light beige or dove grey, and constructed with retaining hood at the rear of each drawer.

H. Continuous or Unit Tops:

1. All cabinets over 42" and up to 72" in height shall be supplied with a $\frac{3}{4}$ " plywood continuous top.
2. All cabinets over 42" and up to 72" in height shall be supplied, where indicated on drawings, with a finished 1" continuous top laminated with high pressure decorative laminate GP28 and balanced with high pressure backer BK20.

I. Bases:

1. Provide and install all base and tall units with finished integral base. Provide $\frac{3}{4}$ " thick marine grade plywood bases. All bases shall have finished facings unless rubber vinyl base covering is being furnished and applied by others.

2.9 DECORATIVE LAMINATE COUNTERTOPS

- 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. Adhesives or fasteners to be provided for securing of tops to cabinet work. Such materials to allow for contraction or expansion of tops where necessary.
- C. Tops shall be 1" thick unless otherwise specified and provided with 4" high curbs where tops abut walls, columns, case ends, etc.
- D. Backsplashes and Side-plashes shall be provided as indicated on drawings.
- E. Types:
1. Plastic laminate counter tops shall be surfaced with general purpose horizontal grade laminate. Cores shall be 1-1/8" built-up wood front edge; #45 density particleboard. All exposed edges, including back and end splashes, must be covered with the same laminate as top surfaces. When splice joints are required, they shall be joined with dowel pins and tite-joint fasteners as needed for a gapless joint.
- F. Plastic Laminate Type: Fire-rated type, 0.050" thick; UL tested and labeled ratings of 25 for flame spread, 25 for fuel contributed and 100 for smoke developed when bonded to wood particle board.
- G. Preparations for Finishing: Comply with AWI Quality Standards, Section I500, for sanding, filling countersunk fasteners, backpriming and similar preparations for finishing of architectural woodwork, as applicable to each unit of work.

PART 3 - EXECUTION

3.1 INSPECTION

- A. The installer must examine the jobsite and the conditions under which the work under this section is to be performed, and notify the contractor in writing of unsatisfactory conditions. Do not proceed with work under this section until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.2 PREPARATION

- A. Conditions laminate clad casework to average prevailing humidity conditions in installation areas prior to installing.

3.3 INSTALLATION

- A. Install casework with factory-trained supervision authorized by manufacturer. Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to accurate fit.
- B. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind.
- C. Lubricate operating hardware as recommended by Manufacturer.

3.4 CLEANING AND PROTECTION

- A. Repair or remove and replace defective work as directed upon completion of installation.
- B. Clean plastic surfaces, repair minor damage per plastic laminate manufacturer's recommendations. Replace other damaged parts or units.
- C. Advise contractors of procedures and precautions for protection of casework and tops from damage by other trades until acceptance of the work by the Owner.

END OF SECTION

SECTION 12500 - WINDOW TREATMENT

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 window treatment is indicated on drawings and in schedules. Types of window treatment work in this section include:

- 1. 2" Horizontal Faux Wood Slat Blinds and operating hardware.

- B. Location: All exterior windows.

1.3 QUALITY ASSURANCE

- A. General: Provide window treatment units which are complete assemblies produced by one manufacturer for each type required, including hardware, accessory items, mounting brackets, and fastenings.
- B. Furnish materials in colors and patterns as indicated, or, if not indicated, as selected by Architect from manufacturer's standard colors/patterns.
- C. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.4 REFERENCE STANDARDS

- A. WCMA A100.1 - Safety of Corded Window Covering Products; Window Covering Manufacturers Association; 2010. (ANSI/WCMA A101.1)

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions for each type of window treatment unit required. Include methods of installation for each type of opening and supporting structure.
- B. Shop Drawings: Submit shop drawings for special components and application conditions of window treatment units which are not fully dimensioned or detailed in manufacturer's product data. Show relationship to adjoining work.
 - 1. Include typical elevation layout indicating proposed division between blind units and meeting edges at corners. Provide sections and details at head and sill between blind units and corners including inclined installations.
 - 2. Provide schedule of all units to be furnished, including field measurements at each location.
- C. Samples: For selection of colors, submit manufacturer's color charts consisting of sections of exposed components with integral or applied finishes showing full range of colors, materials, etc. available for each type of window treatment assembly required.

1.6 WARRANTY

- A. Products shall be manufactured exempt of any sharp edges, burrs, or other defects.
- B. Provide manufacturer's limited lifetime warranty on head rail and other components.
- C. Provide 5 year manufacturer's warranty for slats.

PART 2 - PRODUCTS

2.1 MANUFACTURER

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

New Softball Complex at
Daphne High School for the
Baldwin County Board of Education
Daphne, Alabama

WINDOW TREATMENT
12500-1

1. CACO, Inc. Window Fashions; www.cacoinc.com; 119 Perma R Rd., Johnson City, TN 37604; PH: 1.800.552.5278
 2. Bali; www.baliblinds.com; 8467 Route 405 Highway South, P.O. Box 500, Montgomery, PA 17752; Phone: 877.792.0002
 3. Levolor; www.levolor.com; 3 Glenlake Parkway NE, 10th Floor, Atlanta, GA 30328; 1.800.752.9677
 4. Graber Industries, Inc.; www.graberblinds.com; 8467 Route 405 Highway South, P.O. Box 500, Montgomery, PA 17752; Phone: 877.792.0002
- 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.

2.1 BLINDS AND BLIND COMPONENTS

- A. Head Rail:
1. U shaped configuration
 2. 2 1/2" deep by 2" high with rolled edges at the top.
 3. Fabricate from 0.024 inch thick iron phosphate treated steel.
 4. Acrylic primed with a finish coat of baked on polyester enamel in color selected by Architect.
 5. Provide reinforcing end caps in color to match head rail.
- B. Slats:
1. Extrude to a flat rigid form from PVC foam.
 2. Provide an anti-static dust inhibiting coating to surface to minimize dust accumulation.
 3. Nominal Width: 2 inches wide
 4. Nominal Thickness: .122 inches
 5. PVC foam to meet or exceed requirements of NFPA 701.
- C. Bottom Rail:
1. Profile: Trapezoidal
 2. Nominal Thickness: 7/8 inches
 3. Nominal Width: 2 inches
 4. Fabricate from extruded PVC, finish to match slats.
- D. Valance:
1. Provide manufacturer's standard valance.
 2. Nominal Thickness: 3/8 inch
 3. Nominal Width: 2 1/2 inches

2.2 ACCESSORIES

- A. Tapes and Ladders:
1. Standard color coordinate braided ladders shall be constructed of polyester yarn with a double crossed inter-braided cable thread design.
 2. Supported ladder ladders using ladder tape without any visible distortion.
 3. Ladder rung distances shall not exceed 44mm.
 4. Distances between ladders shall not exceed 12-inches.
 5. Distance from end of ladder to end of slat shall not exceed 5-inches.

- B. Tape Rolls and Supports:
 - 1. Fabricate from low friction thermoplastic which are self lubricating and maintenance free for smooth operation and diminished wear on lift cords and braded ladders.
 - 2. Tape rolls shall be designed to hold tape end by means of a "U" shaped brass grommet which shall be inserted into tape rolls, allowing for a more precise placement of ladders when secured.
 - 3. Tape rolls shall include a projecting thermoplastic cylindrical collar integrated on each end. Tilt rod is centered though both tape drum and collar project.
 - 4. Self lubricating thermoplastic collars are designed to snap securely into tape drum supports for near effortless tilting operation.
- C. Crash Proof Cord Lock:
 - 1. Snap-in design with nylon roller. Provided a secured steel roller on a hinged lock to facilitate "crash-proof" feature.
- D. Tilt Wand:
 - 1. Standard wand tilter.
 - a. Self-lubricating thermoplastic worm and gear mechanism with fully encased plastic housing.
 - b. Color coordinate plastic.
 - c. 3/8" diameter
 - d. Length as required to coordinate with window sizes.
 - e. Provide corrosion resistant metal clip for attachment of wand to tilter shaft.
- E. Lift Cords:
 - 1. Color coordinate lift cords constructed of braided polyester jacket with a rayon center core.
 - 2. Provide in lengths required to properly facilitate the raising and lowering of blinds.
 - 3. 1.8mm diameter.
 - 4. End Support Brackets:
 - 5. Galvanized steel bracket with riveted hinged cover.
 - 6. Nominal thickness: 0.038 inch
 - 7. Baked polyester enamel finish.
 - 8. Color to coordinate with blind assembly.
 - 9. Coordinate bracket anchorage with jamb and sill conditions.

2.3 FABRICATION AND OPERATION

- A. Prior to fabrication, verify actual opening dimensions by accurate site measurements. Adjust dimensions for proper fit at openings. Cooperate with other trades for securing tracks to substrates and other finished surfaces.
- B. Fabricate window treatment components from non-corrosive, non- staining, non-fading materials which are completely compatible with each other, and which do not require lubrication during normal expected life.
- C. Fabricate blind units to completely fill the openings as shown, from head-to-sill and jamb-to-jamb.
- D. For continuous window wall installations, fabricate blinds so that ends occur only over mullions or other defined vertical separation, unless otherwise indicated.
- E. Space supporting ladders to comply with manufacturer's standards, unless otherwise indicated.
- F. Space louver blades to provide a minimum overlap of 3/8" for light exclusion when in fully-closed

position. Gear operating equipment for reduction of the ratio of hand-movement to louver position, so that blinds operate easily and can be set accurately and smoothly.

- G. Equip horizontal blind units, unless otherwise indicated for the following operation.
 - 1. Full-tilting operation with slats rotating approximately 180° . Place tilt operating controls on left-hand side of blind units, unless otherwise indicated.
 - 2. Full-height raising to manufacturer's minimum stacking dimension, with lifting cord locks for stopping blind at any point of ascending or descending travel.
 - 3. Place pull cords on right-hand side of blind units, unless otherwise indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install window treatment units in manner indicated to comply with manufacturer's instructions. Position units level, plumb, secure, at proper height and location relative to adjoining window units and other related work. Securely anchor units with proper clips, brackets, anchorages, suited to type of mounting indicated.
- B. Coordinate the placement of concealed blocking to support blinds.
- C. Verify that openings are ready to receive the work.
- D. Ensure structural blocking and supports are correctly placed.
- E. Provide adequate clearance between sash and blinds to permit unencumbered operation of sash hardware.
- F. Isolate metal parts from concrete and mortar to prevent galvanic action. Use tape or thick coating or other means recommended by manufacturer to effect separation.
- G. Protect installed units to ensure their being in operating condition, without damage, blemishes, or indication of use at completion of project. Repair or replace damaged units as directed by Architect.
- H. Adjust blinds for smooth operation.
- I. Clean blind surfaces just prior to occupancy.
- J. Furnish the following for the Owner's use in maintenance of project:
 - 1. Extra Blind Assemblies: One of each size.
 - 2. Extra Slats: 20 of each type and size.
 - 3. Extra Lift Cords, Control Cords, and Wands: Two of each type.

END OF SECTION

SECTION 12601 – SCOREBOARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Outdoor baseball Scoreboards.
- B. Scoreboard accessories and control systems.

1.2 RELATED SECTIONS

- A. Division 5 - Structural Metal Framing.
- B. Division 9 - Painting
- C. Division 16- Electrical.

1.3 REFERENCES

- A. UL-48, 14th Edition - Standard for Electric Signs.
- B. UL-1433, 4th Edition - Standard for Control Centers for Changing Message Type Signs.
- C. Federal Communications Commission Regulation Part 15.
- D. National Electric Code.

1.4 PERFORMANCE REQUIREMENTS

- A. Scoreboard ETL tested to UL standard.

1.5 SOURCE QUALITY CONTROL

- A. Tests and Inspections:
 - 1. Manufacturer requires sub-contracted printed circuit board subassemblies to undergo functional testing at the point of manufacture.
 - 2. Manufacturer inspects incoming components and subassemblies prior to installation in scoreboard and accessories.
 - 3. Manufacturer functionally tests major electrical subassemblies prior to installation in scoreboard and accessories.
 - 4. Manufacturer inspects and tests scoreboards and accessories at full power prior to shipment.

1.6 SUBMITTALS

- A. Submit under provisions of Section 01330.
- B. Product owner's handbooks provide drawings and other information needed for installation, operation, and maintenance of the scoreboard and accessories.
- C. **Scoreboard Review Meeting: Contractor is responsible for scheduling and attending a "Scoreboard Review Meeting" with the Owner, Scoreboard Manufacturer/Supplier Representative and Architect representative. All Scoreboard products, scoreboard options, logo type, electronic lettering sizes and color selections shall be reviewed and discussed. The Contractor and Scoreboard representative understands the Scoreboard Submittal is not deemed "Fully Approved" until the Owner has completed their review, made comments and given "Approval" with Owner Signature and date on final submittal. The Contractor is to coordinate all power requirements with the electrical drawings and details.**

1.7 QUALITY ASSURANCE

- A. Source limitation: Obtain all components including scoreboard, control console, data cable, and other accessories from a single manufacturer.
- B. Manufacturer's qualifications: Require a manufacturer specializing in building and servicing electronic scoreboards with a minimum of ten years experience.

- C. Adherence to nationally recognized standards:
 - 1. ETL listed to UL Standards 48 and 1433.
 - 2. NEC compliant.
 - 3. FCC compliant.
- D. Scoreboards designed for indoor use should never be used outdoors.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Scoreboards and accessories will be delivered to the installation site unless otherwise specified.
- B. Store scoreboards and accessories in a clean, dry environment.
- C. Special precautions for scoreboard face:
 - 1. Each scoreboard section will be protected during shipment with cardboard or other sheet material. Do not remove protective sheet until the installation begins.
 - 2. Do not lay a scoreboard section face down or stack other objects on the face of a scoreboard.
 - 3. Avoid sliding objects (like another scoreboard) along the plane of the scoreboard face even with protective sheet in place. This can result in LEDs being sheared.

1.9 PROJECT CONDITIONS

- A. Begin scoreboard installation only after associated trade work has been sufficiently completed and will not interfere with the installation of the equipment specified in this section.
- B. Do not install scoreboards until locations are verified by owner and/or architect. The owner determines location of scoreboard, control console, and other accessories.
- C. Do not install scoreboards or accessories until mounting posts are secure and the concrete footings have set.
- D. Contractor is responsible for verifying that the mounting structure is capable of supporting weight and wind load of scoreboard, additional ID panels, and other accessories.
- E. Contractor is responsible for making certain the installation meets requirements set forth in local codes, which may include, but not be limited to, regulations involving the height of the structure, specifications for footings, wind load standards, and approvals by regionally or locally licensed professional engineers.
- F. Contractor is responsible for clearly marking all underground utilities and notifying the appropriate parties prior to work commencement.
- G. Installation of outdoor scoreboards and accessories is dependent upon suitable weather conditions.

1.10 WARRANTY

- A. Warranty: Provide manufacturer's standard five year limited warranty including factory labor and material costs for repairing or replacing defective parts.
 - 1. Warranty coverage based on the date of manufacture.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Varsity Scoreboards; (Basis of Design); 106 Max Hurt Dr., Murray KY 42071-7847; Tel: 800-323-7745; www.varsityscoreboards.com.
- B. Daktronics; 201 Daktronics Dr.; Brookings, SD 57006-5128; Ph. 800-325-8766; www.daktronics.com/en-us.
- C. Nevco; 301 East Harris Avenue, Greenville, IL 62025; Ph: 800.851.4040 or 618.664.0360; www.nevco.com;

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- D. Electro-Mech Scoreboard Company; 72 Industrial Blvd. Wrightsville, GA 31096; 800.677.4780 or 478.864.3366; www.electro-mech.com.
- E. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 OUTDOOR BASEBALL, SOFTBALL SCOREBOARDS

- A. Single-face electronic scoreboard for outdoor use and control console. The standard package should include a simplified 15-key control console.
 - 1. Model 3328.
 - a. Overall Dimension: 8'-0" tall x 28'-0" long x 8" deep; 1,000 pounds hanging weight.
 - b. 15" Super-bright 100,000 hour rated Led display is standard
 - c. 22 gauge galvanneal steel cabinet with powder coat finish.
 - d. LED Digit Protective Shield
 - e. Mounting: Three 8" OD galvanized steel poles (Schedule 40). Poles to be painted. See Section 09900- Painting.

2.3 ELECTRICAL REQUIREMENTS

- A. Outdoor Scoreboards:
 - 1. (1) 120-volt, 20-amp, 60 Hz grounded AC circuit connected to power disconnect switch or circuit breaker.
- B. Keyboard Controller:
 - 1. (1) 120-volt, 15-amp, 60 Hz grounded AC circuit in a standard duplex outlet
 - 2. Include internal battery pack with the controller.
 - 3. Include Wireless transmitter with interface cable attached. Include mounting bracket for transmitter.
 - 4. Cable Recommendations (for cable-controlled systems only): Four conductor cable – 28 gauge, twisted pair (two pairs), shielded data cable

2.4 FINISH

- A. Finish:
 - 1. Powder coat finish.
 - 2. Standard colors available from the manufacturer to be selected by architect.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until conditions meet manufacturer's requirements.
- B. For outdoor scoreboards verify that the mounting posts are correctly sized and positioned to match the mounting points on the scoreboard and any optional ID panels and that their concrete footings have properly cured.
- C. Verify that all electrical components are properly grounded.
- D. If data cable is used, verify continuity from scoreboard to control console location.
- E. Verify data and AC power cables are not run in the same conduit or wire tray or within six inches of each other in the same trench.
- F. Verify data cable and AC power cable are secure and run in conduits where they might be exposed to abuse or where local, state, or national codes require.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's written instructions.

3.3 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
- C. Protect against electrical surges running through power or data connections due to lightning, power equipment problems (floating neutrals, bad transformers, etc.), and improper connections:
 1. Electrical wiring must be grounded.
 2. Outdoor scoreboards must be grounded to one or more 5/8-inch by 8-foot copper clad ground rods driven into the ground in the area where the scoreboard is installed.
 3. Unplug the scoreboard when not in use.
 4. Disconnect the scoreboard from the power source.
 5. Label the scoreboard connections in the connection box, and disconnect the scoreboard from the power source.
 6. Avoid loose connections when not in use.



END OF SECTION

| | | | | | | | | | | | | | |
|---------------------|------------------|---|--------------------|---|-----------------|---|------------------|---|---|----|-------------|-------------|----------|
| AT BAT 48 | BALL 0 | | STRIKE 1 | | OUT 2 | | H/E E4 | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | RUNS | HITS | E |
| GUEST | 0 | 1 | 0 | 0 | 2 | 1 | 0 | | | | 4 | 7 | 1 |
| HOME | 0 | 0 | 0 | 2 | 3 | 1 | | | | | 6 | 9 | |

MODEL 3328

www.varsityscoreboards.com

SECTION 13 13416 – BLEACHERS

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 SCOPE OF WORK

- A. Provide labor, materials, equipment, engineering, and installation to provide a new custom aluminum bleacher system in accordance with the following specifications.
- B. Minimum acceptable criteria:
 1. Design per plan view and sectional view drawings.
 2. The overall length of bleachers shall be per architectural drawings.
 3. The number of rows shall be per architectural drawings.
 4. Height of front walkway from grade shall be per architectural drawings.
 5. Width of front walkway to be per architectural drawings.
 6. Anodized Finish aluminum front enclosure panel to within 2” of grade at the front of bleacher.
 7. The rise per row shall be per architectural drawings.
 8. The depth per row shall be per architectural drawings.
 9. Net seating capacity shall be per architectural drawings.
 10. ADA seating shall be per architectural drawings.
 11. The riser shall be structurally connected to the decking system panel every 12” longitudinal with a ¼” diameter structural grade rivet. Tek screws are prohibited.
 12. One-piece Risers shall interlock to the row above and overlap the rear tread of the row below forming the required overlapping and interlocking riser system. Two-piece and/or wedged-in risers are prohibited.
 13. There shall be no gaps or cavities between the riser portion of the decking system and any supports or attachments. There shall be bolt runner covers at all locations between seat supports.
 14. Aluminum extrusions must use alloy 6063-T6 and 6061-T6.
 15. Understructure members shall be constructed using square tube and aluminum angle extrusions. Vertical columns should have a dimension of 2” x 2” and a minimum wall thickness of 1/8” on all columns except the terminal column which should be 3” x 2”. The footboard supports and bases angles should be 2” x 1.5” x 3/16” aluminum angle. All diagonal bracing should be 1.5” x 1.5” x 3/16” aluminum angle.
 16. All mating connections to create the understructure framing system shall be welded connections and shall be welded on all sides.
 17. All welded connections shall be by certified aluminum welders and inspected at the manufacturer by a licensed Certified Welding Inspector (CWI).

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18. All understructure frames shall be treated after fabrication by a system that employs a commercial cleansing and rinse procedure.
19. Aisle and Egress stairs shall have a ½” overlap.
20. At locations where platforms meet end to end, a beveled 4”-wide aluminum threshold extrusion shall be provided to cover the walking surface.
21. Seat support system shall be universally adjustable to any location on the vertical plane of the decking system. There shall be no through bolting of these items.
22. All seat support, aisle step supports, aisle handrails, and risers shall be installed from the topside of the decking system. There shall be no through bolting of these items through the riser system.
23. Guardrail system shall be constructed with all-aluminum support posts and railings with galvanized chain link fencing.
24. Bleacher manufacture must have a written quality control program for manufacturing, shipping, and installation.
25. All walking surfaces shall be fluted non-skid and slip resistant.

C. Related Sections include the following:

1. Division 3 Section “Cast-in place Concrete” for concrete mix design and testing requirements.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. General: Provide a complete, custom bleacher system of mutually dependent components and assemblies that form a custom system capable of with standing structural and other loads, thermally induced movement, and exposure to weather without failure. Include primary and secondary framing, decking system, seating, handrails, guardrails, press box, and accessories complying with requirements indicated, including those in this Article.
- B. Structural Performance: Provide bleacher system capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Design Loads / Structural – Framing Members
 - a. Dead Loading: 6 PSF for understructure
 - b. Live Loads: 100 PSF for understructure
 2. Design Loads / Decking System
 - a. Dead Loading: 6 PSF for decking, platforms, stairs, and ramps
 - b. Live Loads: 100 PSF for decking, platforms, stairs, and ramps
 - c. Deflection Limits: engineer assemblies to withstand design loads with deflections no greater than the following:
 - I. Decking, platforms, stairs, and ramps: vertical deflection of L/360
 - d. Sway loads of 24 PLF per row parallel to seat and 10 PLF per row perpendicular to seat run.
 3. Design Loads / Handrail / Guardrail
 - a. 100 PLF Vertical

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- b. 50 PLF applied in any direction
 - c. 200 LB Concentrated load any direction
 - d. 50 PSF fencing and infill
4. Design Loads / Seat Boards
- a. Live Loads: (vertical) 120 pounds per lineal foot

1.4 SUBMITTALS

- A. Shop Drawings: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of the following bleacher system components:
- 1. Foundations:
 - a. Footings, slab, and reinforcement.
 - 2. Structural framing:
 - a. Primary and secondary framing including but not limited to the following:
 - i. Vertical & Horizontal Members
 - ii. Bracing
 - iii. Connecting hardware
 - 3. Tredweld Decking System:
 - a. Decking Platforms
 - b. Risers
 - c. Supports for Seats
 - d. Aisle Steps
 - e. Aisle Handrails
 - f. Egress Stairs
 - g. Hardware
 - 4. Seating
 - 5. Handrails and Guardrails
 - 6. Ramps

1.5 QUALITY ASSURANCE

- A. Concrete Installers Qualifications: An experienced installer who has completed concrete work similar in material, design and extent indicated for this project and whose work has resulted in construction of bleacher system with a record of successful in-service performance. Concrete install must be certified by bleacher manufacturer.
- B. Erector Qualifications: An experienced erector who has specialized in installing bleacher systems similar in material, design, and the extent indicated for this project. Bleacher erector must be certified by bleacher manufacturer.
- 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 installation of bleacher systems that are similar in material, design, and the

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extent indicated for this project. All approval drawings shall bear the seal of a registered professional engineer in the state of installation.

- D. Quality Control: Manufacturer's written quality control for manufacturing, shipping and installation shall be submitted prior to award of contract.
- E. Standards and Guidelines: Comply with the latest editions of provisions of the following codes, specifications, and standards, except as otherwise noted or specified:
 - a. American Concrete Institute (ACI)
 - b. Aluminum Association of American
 - c. American Welding society (AWS)
 - d. Americans with Disabilities Act (ADA)
 - e. International Building Code (IBC)
 - f. International Code Council 300 (ICC 300)
- F. Site visitation: Bidder shall be responsible for visiting the job site prior to the bid date to verify site conditions.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Materials and other manufactured items will be packaged and loaded for transport to prevent bending, warping, twisting, and any other surface damage of materials. Care will be taken at the job site to prevent any damage to materials.
- B. Materials must not be stored where they would come in contact with other materials that might cause staining, denting, or any other surface damage.

1.7 WARRANTY

- A. All products after proper erection and under normal use for this type of structure shall carry a one (1) year warranty against all defects in materials and workmanship.

PART 2 – PRODUCT

2.1 MANUFACTURER

- A. The following manufacturers' products have been used to establish minimum standards for materials, workmanship and function for the Aluminum Framing Members and Aluminum Decking System:

Outdoor Aluminum, Inc., Geneva, AL (Basis of design) 1-800-225-4249

- B. Other manufacturers must request approval to bid the specified product and be listed as approved to bid via addendum; being listed as an acceptable manufacturer in name only does not eliminate the requirement to meet all aspects of the written specifications contained herein.

2.2 CONCRETE FOUNDATIONS

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- A. Foundations shall be designed in accordance with mix designs per Section 033000- Cast-in-Place Concrete.
- B. Foundations shall be either concrete slab or concrete runners by others.

2.3 STRUCTURAL – FRAMING MEMBERS

- A. The understructure of the system shall consist of a series of aluminum frames spaced at intervals of no more than 6'-0" and shall be joined by means of aluminum sway braces.
- B. Each stringer shall consist of vertical members, adequate diagonal braces, and horizontal members welded to form the proper rise per row and proper back to back spacing between seat rows.
- C. All welded connections shall be by certified aluminum welders and all mating parts shall be welded on all sides to assure adequate strength.
- D. Vertical members shall be constructed on 2" x 2" x 1/8" square tube aluminum for all columns except the terminal column which shall be 3" x 2" x 1/8" square tube aluminum, alloy 6061-T6, mill finish.
- E. Horizontal members shall be constructed of 2" x 1.5" x 3/16" aluminum angle, alloy 6061-T6, mill finish.
- F. Sway braces shall be constructed of 1.5" x 1.5" x 3/16" aluminum angle, alloy 6061-T6, mill finish.

2.4 DECKING SYSTEM

- A. Decking System Platforms:
 - 1. Decking system platforms shall consist of extrusions laid side by side to form the tread width. These individual extrusions are then clamped and factory fixture welded. The treads shall be welded in a single pass with .0035 diameter 4043 welding wire, using argon gas. This method will result in a rigid, positively joined tread.
 - 2. Individual tread lengths shall be a maximum length of 37'-6", while the actual length designed to create the minimum number of expansion seams.
 - 3. Decking shall be attached to the supporting aluminum tube understructure by means of concealed aluminum clips, galvanized bolts, washers, and nuts.
 - 4. Platforms shall have a minimum aluminum wall thickness of .078" and aluminum shall be alloy 6063-T6.
 - 5. Walking surface shall be fluted non-skid, slip resistant, and aesthetically pleasing without showing traffic pattern wear.
 - 6. The rear portion of the platform will turn ninety degrees vertical to accept the next row of decking platforms. The front portion of the platform shall be complete

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with a female front edge to allow for a positive male-to-female connection of a vertical riser.

7. At locations where platforms meet end to end, a beveled 4"-wide aluminum threshold extrusion shall be provided to cover the walking surface. Threshold shall be beveled on both sides so as not to create a trip hazard and must have a fluted surface to prevent slipping. Threshold must comply with specified deflection criteria and must allow for expansion and contraction once installed.

B. Decking System Riser:

1. The decking system riser shall be extruded aluminum; alloy 6063-T6 with a 204 R1 anodized clear finish.
2. This extrusion shall have a male ridge running continuous at the upper leading edge to interlock with the front portion of the decking system panel.
3. The riser shall be structurally connected to the decking system panel every 12" longitudinal with ¼" diameter structural grade rivet. Tek screws are prohibited.
4. There shall be no gaps or cavities between the riser portion of the decking system and any supports or attachments.

C. Decking System Seat Supports:

1. The decking system seat support shall be of extruded aluminum angle.
2. Once installed the seat support shall have no noticeable gaps between the decking system riser and support.
3. Seat support system shall be universally adjustable to any location on the vertical plane of the decking system.

D. Decking System Aisle Handrails:

1. The decking system aisle handrails shall be 1-5/8" schedule 40 anodized aluminum pipe.
2. Handrails shall have a center line handrail and the spacing between rails shall not be less than 22" or more than 36". Handrails shall be discontinuous and shall not span more than five rows of seating.

E. Egress Stairs:

1. The decking system egress stair stringers are to be constructed of 8" aluminum channel, alloy 6061-T6. Tread supports to be welded to 8" members to totally cap the end of the 2" x 12" stair tread against the channel web.
2. Walking surface of tread shall be complete with female front edge to allow for positive male-to-female connection of the riser closure. All risers to be fastened to the rear tail of the stair tread with ¼" diameter structural grade rivet.
3. Stair tread nosing to be anodized black. Nosing shall have no external fasteners.
4. Stair grab rail to be constructed of 1-5/8" schedule 40 anodized aluminum pipe with no fittings at transition from sloped system to grade.

F. Decking System Hardware:

1. All bolts, washers and nuts shall be galvanized.

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2. End caps shall be of a heavy duty, clamping, aluminum channel design fastened to the ends of extrusions with aluminum rivets. End caps shall close all end openings of extrusions and shall be a full-length piece and match in both color and finish the extrusion to which they attach.
3. All riser fasteners shall be structural 1/4" diameter structural grade rivet.

2.5 SEATING

A. Bench Seating:

1. Seats shall be of extruded aluminum with a fluted non-skid surface, alloy 6063-T6, with 204R1 anodized clear finish.
2. Plank shall be 2" x 10" nominal with a wall thickness of .078" (+/- 0.006" industry tolerance) at the smooth surface.
3. Finish size shall be 1-3/4" x 9-1/2".
4. Seats shall attach to the decking system seat supports by means of concealed aluminum clips, galvanized bolts, washers, and nuts.
5. Seat supports shall be installed on centers that will allow for the same design deflection criteria required by code.
6. End caps shall be extruded aluminum and shall match in both color and finish the plank to which they attach. All end caps shall be single piece and shall attach to the underside of the plank with a minimum of two aluminum rivets.

2.6 HANDRAILS AND GUARDRAILS

A. Handrail and Guardrail System:

1. All railing shall consist of 1-5/8" schedule 40 anodized pipe.
2. All pipe fittings shall be of cast aluminum.
3. Guardrail supports to be 3" aluminum channel, alloy 6061-T6.
4. Rail pipe shall be secured to the guardrail support by means of galvanized tension bands.
5. The top rail shall be 42" minimum above the nearest seat on the sides and rear, and 42" above the tread on the front walkway.
6. Handrails on stairs shall be 34" above the leading most edge of the stair tread.
7. Galvanized or vinyl chain link fence shall be provided on the front, sides and rear of the grandstand and at all egress areas.
8. Handrails shall be provided at all walking areas and shall extend 1-1/2" from guardrail material. Standoff shall be extruded aluminum, alloy 6061-T6
9. Handrails shall have internal sleeves for splice purposes and finished rail shall be continuous and shall not exceed 1-5/8" diameter.

2.7 RAMPS

- A. Wheelchair accessible ramps shall conform to code with a minimum 60" clear width and a maximum 1:12 slope shall be provided.
- B. Understructure shall be constructed of same materials as bleacher support structure.

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- C. Decking and handrails shall be constructed of same materials as bleacher decking.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Before erection proceeds, certified bleacher installer will survey elevations and locations of concrete pads or runners to verify compliance with requirements and bleacher manufacturer's tolerances.

3.2 ERECTION

- A. Erect bleacher system according to manufacturer's written instructions and erection drawings.
- B. Do not field cut, drill, or alter structural members without written approval from bleacher system manufacturer's professional engineer.
- C. Set structural framing in locations as indicated.

3.3 CLEANING AND PROTECTION

- A. Clean all metal surfaces promptly after installation of work.
- B. Exercise care to avoid damage to protective coatings and finishes.
- C. Remove all excess construction material and dispose of all debris.

3.4 MODULAR PRESS BOX

- A. MODULAR 8' X 18' PRESS BOX SPECIFICATIONS:
- B. USE GROUP A-5
- C. CONSTRUCTION TYPE V-B
 - 1. FLOOR CONSTRUCTION
 - a. Bottom Board: 1/2" CDX plywood sheathing (painted black)
 - b. Continuous aluminum vent
 - c. Insulation: Min. R-19 fiberglass batts, with vapor barrier.
 - d. Joists: 2" x 6" #2 SPF, on 12" centers, transverse framing.
 - e. Decking: 3/4" Sturdifloor, underlayment grade, tongue and groove fir plywood, (Index 24" O.C.).
 - f. Covering: 1/8" Armstrong Excelon vinyl composition tile.
 - g. Molding: 4" vinyl base molding by Roppe.
 - 2. WALL CONSTRUCTION
 - a. Studs: 2" x 6", #2 or better SPF, on 16" centers, IBC framing.
 - b. Bottom Plate: 2" x 6" #2 or better SPF.

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- c. Top Plates:(2) 2" x 6" #2 or better SPF.
- d. Headers:
 - 1) As span and design load requires
 - 2) Ceiling Height: 8'-0" x 7'-9", front to back.
 - 3) Covering: 5/8" vinyl-faced gypsum panels, Class A, F.S.R.
 - 4) Insulation: Min. R-19 fiberglass batts with vapor barrier.
 - 5) Sheathing: 1/2" CDX plywood
 - 6) House wrap air infiltration barrier
 - 7) Siding: "PBU-Panel" .026 gauge ribbed steel panels with Kynar 500 finish.
- 3. ROOF CONSTRUCTION
 - a. Joists: 2" x 8", #2 SPF, 16" O.C. spacing or #1 SYP as required.
 - b. Overhang: 16" over front wall; 10" over rear wall. .019 aluminum fascia with perforated aluminum soffit panels.
 - c. Ceiling: 5/8" type-x fire rated gypsum board, taped and bedded with spray textured finish,
 - d. Insulation: Min. R-19 fiberglass batts with vapor barrier.
 - e. Decking: 3/4" Sturdifloor, tongue & groove plywood roof decking for camera decks (Index 24" O.C.)
 - f. Covering: .060 single-ply EPDM rubber membrane, fully adhered.
- 4. WINDOWS
 - a. PGT WinGuard HS5510 aluminum horizontal sliding window with insulated impact resistant glass
 - b. Interior windows to be 1/4" tempered safety glass fixed pane with stained jambs and casing.
- 5. DOORS: (Exterior)
 - a. 36" x 80" CECO 18 Ga. Insulated galvanized steel door with 16 Ga. Steel wrap around frames, rigid vinyl weather stripping, aluminum threshold, 10" x 10" window, hydraulic closer and commercial lever handled locksets.
 - b. Min. U-Value = .16
- 6. DOORS: (Interior)
 - a. 1-3/8" solid-core stained Birch door with stained Fruitwood Birch wood jambs and casing. Passage lever-handled hardware.
- 7. ELECTRICAL
 - a. Service Entrance Panel:
 - 1) Square D QO112M100 with Main Disconnect; rated at 120/240v, single phase,100 amp capacity.
 - b. Switches/Receptacles:
 - 1) Pass & Seymour #TM870 125 volt/15 amp duplex, spec-grade, switches.

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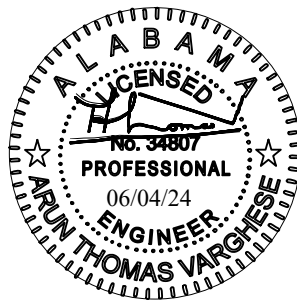
- 2) Intermate #EI500 programmable astronomical timer switches as required.
 - 3) Lutron #MSOPS5MLA occupancy sensor switches as required.
 - 4) Pass & Seymour #3232 125 volt/15 amp duplex, spec-grade, receptacles.
 - 5) Wiremold 5400 Series two-piece multi-channel, dual voltage, non-metallic surface raceway along front wall below scorer's counter, outlets on 48" centers.
 - 6) Conduit prep and circuitry for customer's PA and DATA systems - (PA and DATA systems by others)
8. LIGHTING
 - a. Interior: SATCO #45/LED/1X4/FLUSH/3K/WH 45 watt, 30K LED 1X4 surface mounted LED light.
 - b. Exterior: SATCO #S9014 4" (7 watt) 4000K LED recessed light
 - c. Emergency/Exit: Lithonia ECR-REM-LED emergency combination exit/flood light with 90 min. battery back-up and ERE-SLG-WP LED remote emergency flood light
 9. CIRCUITS
 - a. All branch circuit wiring is minimum #12 THHN copper wire encased in EMT thin-wall conduit or MC cable.
 10. HVAC
 - a. GE Zoneline 4500 or Equal series packaged terminal HVAC unit with wall mount thermostats.
 11. SCORER'S COUNTER
 - a. 20" deep x 3/4" lauan grade plywood with 1-1/2" x 2" edge, surfaced with .060 plastic laminate by Nevamar.
 12. MISCELLANEOUS
 - a. 10 LB. dry chemical fire extinguisher.
 - 1) Rated 4-A: 20-B:C

END OF SECTION 13 34 16

MECHANICAL
SPECIFICATIONS
15000



ELECTRICAL SPECIFICATIONS 16000



SECTION 15100 - GENERAL REQUIREMENTS FOR MECHANICAL WORK

PART 1 – GENERAL

GENERAL SCOPE OF WORK

This project is for providing new HVAC equipment for the new concessions building at James M. Seals Park. It is intended that specifically identified equipment shall be installed new to ensure complete and functional systems. More specifically, equipment included in this scope of work shall include, but is not limited to:

Wall Mounted Electric Unit Heaters
Ductless Ceiling Mounting Mini-Split Heat Pump Unit
Ducted Mini-Split Heat Pump Unit
Ductwork
Grilles, Registers, & Diffusers
Exhaust Fans
Insulation
Air Purification Devices

The contract drawings specifically describe the work required for each unit of equipment. The contract specifications specifically describe the products to be provided. All documents shall serve as an integral part of the other and be considered as one. Any conflicts between these documents shall be resolved prior to bidding. It is expected the worst-case description (i.e.-more expensive, higher quantity) shall take precedence in the event of a discrepancy.

GENERAL REQUIREMENTS

Scope of Section: Include all materials, equipment, and labor necessary for complete and properly functioning mechanical installations in accordance with local and state codes, contract drawings and as specified in all 15000 series of these specifications.

DRAWINGS

Mechanical drawings indicate the general arrangement and extent of work. Exact locations and arrangements of materials and equipment shall be determined in the field prior to beginning any work to conform in the best possible manner with the surroundings and with the adjoining work of other trades. References to locations of equipment, devices or fixtures shall be verified in the field with actual dimensions and not by scaling drawings

COORDINATION OF WORK

Prior to installation, coordinate all work with work of other trades and with field conditions in sufficient detail to preclude interferences between the work of different trades and to insure necessary clearances at 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.

The Contractor shall coordinate the contract drawings and specifications for all other trades and shall report any discrepancies between them to the Engineer and obtain from him written instructions for changes necessary in the mechanical or electrical work. All work shall be installed in cooperation with all other trades. Before installation, the Contractor shall make proper provision to avoid interferences in a manner approved by the Engineer. All changes required in the work of the Contractor due to his neglect shall be corrected by the Contractor at his own expense.

CODES, PERMITS, TAXES

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.

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:

ASHRAE, 2012 "HVAC Systems and Equipment" – Chapter 19, Duct Construction
SMACNA Standards for Duct Construction
International Building Code – 2021
International Plumbing Code – 2021
International Mechanical Code – 2021
International Fuel Gas Code – 2021
NFPA-90A (2009) – Installation of Air Conditioning and Ventilation Systems
Local Municipal Codes

The Contractor shall obtain and pay for all required permits, inspections, and certificates of inspection. Certificates of inspection shall be delivered to the Architect/Engineer/Owner upon completion of the job.

Correction of Work: Work done contrary to above requirements shall be corrected at no additional cost to Owner.

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. Certificates of inspection shall be delivered to Architect/Engineer upon completion of project. Per the State of Alabama Building Commission Administrative Rule 170X-8 Collection of User Fees, the Permit Fee shall be included in the Contractor's bid and be paid by the Contractor.

DISCREPANCIES

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.

SUBMITTALS

Refer to Section "General Requirements".

Material List: Within thirty (30) days of award of contract, Contractor 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.

Shop Drawings: Before commencing work, submit drawings of all mechanical materials and equipment to be furnished under this contract. In addition, 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.

Samples: Submit samples of materials upon request for approved substitutions and as listed elsewhere herein. Samples shall duplicate materials, workmanship, and finish of products intended for installation.

RECORD DRAWINGS

Provide in accordance with "General Requirements" section.

INSTRUCTIONS

Personnel: After completion of installation, competent personnel shall be furnished to instruct Owner's personnel in operation and maintenance of systems.

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 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 Engineer (for delivery to Owner).

FINAL CHECK

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.

FOUNDATIONS

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

Engineers drawings. Support equipment from structures in a manner acceptable to the Engineer.

SAFETY PROVISIONS

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.

RELATED WORK

The following items of material and labor incidental to or related to the work will be provided as follows:

Cutting and patching of existing building structure for location of pipes, air ducts, etc., shall be provided by this Contractor. Patching and finishes shall be performed by affected trades.

Furring around pipes, ducts, etc., shall be by General Contractor.

All exposed metal work shall be coated or painted with a corrosion resistant material. Coordinate procedure and color with Architect.

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 be provided under this section of this specification.

PART 2 – PRODUCTS

GENERAL

Quality: Conform to the quality and features specified and indicated on 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.

SLEEVES

Pipe Sleeves:

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.

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.

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).

Duct Sleeves: Sleeves or openings sized to pass mechanical ducts and coverings of framed construction in roof, walls and partitions.

Sealing of Sleeves:

Below Grade: Caulk annular space between pipe and sleeve using oakum and poured lead both sides minimum 1" deep to make floor penetration watertight.

Above Grade: Make openings around pipes, etc., passing through sleeves draft-free and vermin-proof by packing solidly using mineral wool or glass fiber.

SUPPORTING DEVICES

Inserts:

Preset Type: Malleable iron with removable interchangeable nuts having lateral adjustment of not less than 1". 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.

Afterset Types: Self-drilling style expansion shields shall be used in concrete and brick. Toggle bolts shall be used on block walls and partitions.

Steel Framing:

Support hangers from bar joists with clamps or other means acceptable to Architect. Refer to Construction Drawings for limitations and requirements for providing reinforcing of joists at hanging points.

Hangers shall be plumb within 1/2" in 4' and spaced as required for the service intended. Where unforeseen conditions necessitate additional hangers, install same in locations subject to Architect's approval.

Stud Partitions: All anchorage shall be to studs or solid blocking built into the wall.

Equipment, Piping and Duct Hangers:

Provide angles, brackets, clamps, anchors, braces, frames, rods and other miscellaneous steel items as necessary for support of equipment and piping specified herein.

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.

FLOOR, WALL AND CEILING PLATES OR ESCUTCHEONS

Furnish escutcheons or fabricated plates or collars and install at each location where pipe or duct passes through a finished surface. Escutcheons for flush sleeves shall be equal to Benton & Caldwell No. 3A chromium plated brass; for sleeves extending above floor shall be equal to Benton & Caldwell No. 36 chrome plated brass. Collars or plates for

ducts and large diameter insulated pipe shall be fabricated of 18-gauge galvanized copper bearing steel, secured to structure and neatly fitted around duct or pipe.

ACCESS DOORS

Each door shall be equipped with two flush, screwdriver operated cam latches and other than Style "M" shall be finished to match adjacent surface. Door sizes shall be applicable to the access required for normal service. Doors shall be manufactured by the Inryco/Milcor or an acceptable equal, as follows:

| <u>Location</u> | <u>Milcor Style</u> |
|-----------------|---------------------|
| Drywall | "DW" |
| Masonry or Tile | "M-Stainless" |
| Acoustical Tile | "AT" |
| Plaster | "K" |
| Fire-rated Wall | "Fire Rated" |

Furnish as necessary for access to concealed valves, cleanouts, unions, expansion joints, dampers, coils, junction boxes, etc., where no other means of access is shown or specified.

PAINTING AND MARKING

Painting: Painting of equipment, pipe, and ducts (insulated or un-insulated) 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.

Marking:

Pipes: All utility piping above and below the ceiling 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 Standard A-12.1.

Equipment: Fans, ducts, etc., shall be stenciled as specified above. Small equipment such as starters, control devices, etc., shall be neatly labeled with 3/4" engraved, plastic labels, white letters on black background.

PART 3 – EXECUTION

ELECTRICAL

General: Unless specified otherwise, motors, starters, and control devices shall be furnished under the division of the specifications that covers the driven equipment. Motor starters shall be installed by the electrical contractor except where as an integral part of the equipment. Reference electrical plan for location of starters relative to specific 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.

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 horsepowers 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.

Starters shall be furnished under this section of the specification:

General: As specified with modifications and accessories as indicated in other Sections of this specification or by control diagrams on drawings. Starters shall have proper rating for motors controlled.

Over Current Protection: Contacts shall break each ungrounded line to the motor. A thermal Over current device shall be provided in each ungrounded line. All contacts shall open simultaneously upon tripping of any Over current device.

Magnetic Starters: For motors of 1/2 HP or larger, combination type with unfused disconnect switch, unless specified otherwise in other sections. 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.

Manual Starters: Provide for motors through 3/4 HP unless specified otherwise under equipment specifications.

All starters shall be provided with hand-off-auto switches, normally open and normally closed auxiliary contact.

END OF SECTION 15100

SECTION 15200 - TESTING AND BALANCING

PART 1 – GENERAL

GENERAL REQUIREMENTS

The General Conditions, Supplementary Conditions and Division 1, General Requirements, apply.

This portion of work is to be included in the base bid.

QUALITY ASSURANCE

Testing Agency:

Submit name, address, and qualifications of testing agency to Architect/Engineer for approval prior to start of testing.

All system adjustments, test and balances are to be performed by a company regularly and exclusively engaged in this work. Agency shall be a member in good standing of the Associates Air Balance Council (AABC).

Procedures shall be as outlined in the latest AABC Publication for total system balance.

SUBMITTALS

Test Reports: After completion, submit three (3) hard copies of the certified copies of test and balance report to the Architect/Engineer for review and as a project record document.

JOB CONDITIONS

Commencement of Test: Do not begin balancing until the systems have been completed and are in full working order, or at the direction of the Architect/Engineer, place any part thereof in operation for the purpose of balancing.

Plans and Data: Furnish the balance agency one (1) complete set of all approved up-to-date mechanical plans and shop drawings of all cooling, heating and air distribution equipment.

FIELD QUALITY CONTROL

Performance Data: Record the following data and submit to the Architect/Engineer.

System Component Capacity: Record and calculate all data necessary to demonstrate capacity under actual operating conditions, and adjust dampers, valves, control valves and machine drives to obtain a suitable operating balance for each system. Record data for each item of equipment simultaneously with data from all associated equipment together with coincident outside air-dry bulb temperatures to permit evaluation of total system performance. Data to include the following:

Supply, return and outside air quantities for each air conditioning and ventilation system.

Air volumes and velocities for each fan, cooling coil and air cleaning assembly.
Entering and leaving air dry bulb and wet bulb temperature for each cooling and heating coil (if integral to air handler).
Static pressures for all air handling units.
Actual voltage and current input for each motor.

Mechanical contractor is responsible for providing and installing all necessary sheaves required to properly balance systems.

COORDINATION

It shall be the test and balance sub-contractor's responsibility to coordinate with the Owner, design consultant, general contractor, HVAC sub-contractor and Owner's controls vendor to ensure all parties are informed of progress toward completion as well as difficulties encountered toward that end.

TEMPERATURE CONTROLS

Set adjustments of all controllers to operate according to existing operating sequence. Make four hour temperature traverse of each area or zone. Provide testing agency personnel with instruments to verify reports to Architect.

FINAL TEST

At conclusion of testing agency's work, demonstrate to the Architect/Engineer that the equipment is mechanically sound, that the systems deliver the rated output without objectionable noise, distress or vibration, and that the temperature controls are functioning properly.

END OF SECTION 15200

SECTION 15400 - PLUMBING

PART 1 - GENERAL

SCOPE OF WORK

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:

Cold water piping and connections to new fixtures as shown or indicated on the drawings.

Hot water supply piping, including connections to new fixtures, as shown or indicated on the drawings.

A system of sanitary soil, waste, and vent piping including connections to existing services, and new fixtures as shown or indicated on the drawings.

A system of thermal insulation for all new potable water piping.

All fixtures and equipment as hereinafter specified, completely installed and operational.

All necessary cutting and/or core drilling to install plumbing systems in this section.

RELATED DOCUMENTS

Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 1 specification sections apply to work specified in this section.

GUARANTEE

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.

CODES AND REGULATIONS

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.

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.

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:

2021 International Building Code
2021 International Fuel Gas Code
2021 International Fire Code
2021 International Mechanical Code
2021 International Plumbing Code
2010 ADA Standards for Accessible Design
NFPA-101 - Life Safety Code
Local Municipal Codes
National Electrical Code (NFPA 70)

FEES AND PERMITS

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.

RECORD DRAWINGS

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, copies shall be turned over to the Architect.

COOPERATION

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.

VISITING THE PREMISES

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.

VERIFICATION OF CONTRACT DRAWINGS

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.

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.

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.

WORKMANSHIP

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.

RESPONSIBILITY OF BIDDER

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.

NOISE AND VIBRATION

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.

SUBMITTAL DATA

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.

Partial submittals will not be considered. Each item submitted shall be identified by its applicable drawing number.

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.

The following equipment and materials must be submitted for approval:

- Valves
- Cleanouts
- Access Panels
- Piping and materials
- Insulation
- Plumbing fixtures, including traps, supplies, and carriers
- Water Hammer Arrestors
- Floor Drains
- Trap Primers
- Water Heaters

START-UP SERVICE

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.

PIPING

Provide pipe sleeves through masonry construction, and install escutcheon plates around exposed piping in all rooms.

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.

All plastic pipe shall bear the NSF Seal of Approval, and such other markings as required by the aforementioned standards.

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.

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

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.

PIPE SUPPORT

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.

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.

All anchorages shall be to studs or solid blocking built into the wall. No plumbing straps shall be used.

PIPING PLACEMENT

Place in most direct manner permitted by construction, free of unnecessary offsets, making changes in direction by means of standard fittings.

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.

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.

Waste Arms

Type "K" copper or IPS brass pipe typical; Alloy steel or IPS brass pipe at urinals.

Test Fittings

Not shown on the drawings; provide where required for partial tests. Provide test tees at base of all stacks.

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".

Soil Pipe

Support to firm earth below floor slabs.

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.

Connections of vertical soil pipe to all connections in horizontal soil pipe to be made by "Y" fittings.

Vent Pipes

Main soil pipe stacks to be extended up through the building full size with increaser through roof per code.

Connect branch vents into main stacks with connections not less than 4 feet above the highest fixture.

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.

Water Piping

Place supply pipes as shown or as directed in neat arrangement and parallel or at right angles to walls, joists, etc.

Place shock absorbers at each fixture group as recommended by manufacturer. Shock absorbers shall be PDI certified.

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

WATER PIPING

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.

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.

GAS PIPING

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.

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).

All piping shall be installed in accordance with NFPA recommendations and the National Fuel Gas Code complete with all necessary appurtenances.

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.

Use ground joint unions in all screw piping joints.

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".

UNIONS

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.

Unions in copper pipe shall be cast bronze, WOG pattern, ground joint, 150 psi type.

Unions in steel pipe shall be malleable iron, WOG female pattern brass seat, ground joint, 150 psi type.

Unions connecting dissimilar metals shall be dielectric type.

TRAP PRIMER DISTRIBUTION UNIT

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.

VALVES AND COCKS

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. For all valves above lay-in ceilings, their approximate locations shall be indicated with blue labels on the ceiling grid.

Angle or straightway chromium plated stops on the supplies to all fixtures shall be accessible from the same room in which the fixtures are located.

All valves shall be the product of one manufacturer as cataloged by Milwaukee, Stockham, Crane, or Nibco.

For water piping, valves shall be equal to 125 psi SWP/200 psi WOG Nibco as follows:

Gate valves 1/2" to 3" = S-111.

Ball valves 1/2" to 2" = S-585.

Check valves 1/2" to 3" = S-413W.

WALL HYDRANTS

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 Z-1325. Coordinate wall thickness at installation location. Adjust location as necessary to enclose piping within the wall.

Exterior hydrants shall NOT be wall hydrants. Exterior hydrants shall each be Zurn Z1370 ground hydrants with a locking cover. Coordinate final locations to ensure piping is adequately protected from freezing. Freezeproof hydrants shall be installed in compliance with IPC section 608 and the Zurn Z1370 ground hydrants shall be permanently identified with signage reading as follows: "CAUTION, NONPOTABLE WATER. DO NOT DRINK."

THERMAL INSULATION WORK

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.

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.

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.

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.

Contractor shall insulate hot water supply assembly and P-Trap assembly with insulation kit equal to Brocar or Trubro on handicapped lavatories.

FLOOR, WALL, AND CEILING PLATES

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.

PLUMBING FIXTURES AND EQUIPMENT

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.

Provide stops in hot and cold water upstream of 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.

Provide stops for all fixtures. Traps for all fixtures shall be 17- gauge chromium plated brass.

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.

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, interior 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-4A WATER COOLER: Dual type, exterior wall mounted, barrier free, Elkay VRCTL8WSK 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 CONCESSIONS SINK: Elkay LRAD3322 countertop 18 gauge type 304 nickel bearing 33" x 22" stainless steel sink with two 6-1/2" deep bowls. Provide with American Standard 6405.171 gooseneck faucet with wristblade handles and color matched spray, basket strainers, flexible supplies and stops. Install per ADA requirements.
- P-6 CONCESSIONS HAND SINK: Elkay CHS1716C stainless steel, single compartment, 16-3/4" x 15-1/2" x 6" with 7" high backsplash, LK940GN04L2H chrome plated gooseneck spout faucet with aerator, LK8 chrome plated, stamped brass, perforated strainer grid, with LK500 chrome plated cast brass 2" P-trap with cleanout, waste arm to wall and wall flange. Provide flexible supplies, and stops, and Zurn Z1231 concealed arm carrier. Provide splash guards as required.
- P-7A SHOWER: Aqua Bath AB4136SH shower with curtain rod. Provide with curtain, single handle, pressure balanced shower valve with hand held shower head and 24" vertical slide bar and 2" IPS drain with 5" diameter chrome plated strainer Zurn ZN-415.
- P-8 MOP SINK: 36" x 36" x 12", terrazzo, Fiat TSB700 with Fiat 830-AA wall mounted faucet with hose, 889CC bracket, vacuum breaker, stainless steel bumper guards, and stainless steel wall splash guards. Unit shall be provided with 3" drain.
- P-8A MOP SINK: 24" x 24" x 12", terrazzo, Fiat TSB100 with Fiat 830-AA wall mounted faucet with hose, 889CC bracket, vacuum breaker, stainless steel bumper guards, and stainless steel wall splash guards. Unit shall be provided

with 3" drain.

- P-9 LAUNDRY SINK: Mustee 1RLN7 24" x 20" x 13" deep polypropylene utility sink. Provide with deck-mounted gooseneck faucet. wrist blades and basket strainer. Provide 1-1/2", 17-gauge P-Trap, continuous waste, and flexible supplies.
- P-10 TRAINERS ROOM SINK: Elkay LRAD172265 Stainless steel, counter mounted, single-compartment, 6-1/2" 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 with stops. Provide insulation kit and Leonard model 170 thermostatic mixing valve.
- P-11 ICE MAKER BOX: Guy Gray BIM875 fully recessed, with 1/2" FIP inlet and 1/4"O.D. outlet compression valve.

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 drainage) 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.

CLEANOUTS

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.

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.

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.

In Concrete Floors: 58190, adjustable head, cast iron head and ferrule with ABS plug, round loose set scoriated tractor cover.

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.

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".

In Quarry Tile Floors: 56040-13-1, adjustable cast iron head and ferrule, ABS plug and

round brass terrazzo cover and rim.

ELECTRIC TANK-TYPE WATER HEATERS

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.

Provide Watts 100XL temperature and pressure relief valve, Watts N36 vacuum relief valve, galvanized drain pan, and 5-year warranty on tank. See schedule for electrical characteristics.

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.

ELECTRIC TANKLESS WATER HEATERS

The water heater shall meet the minimum values as scheduled based on the design model indicated.

PART 3 - EXECUTION

COMPLETION OF WORK

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.

TESTING

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.

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.

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.

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.

DISINFECTION

Disinfect all domestic water piping in accordance with local health department guidelines.

ATTACHMENTS

General: Contractor to execute originals of attached copies.

Copy of Permit Request to Install Boiler or Pressure Vessel, State of Alabama Department of Labor

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 _____ | | CONTROLS TESTED YES _____ NO _____ N/A _____ | |
| PRESSURE VESSEL USE Process _____ Storage _____ Service _____ Other _____ (explain) | | DIMENSIONS (length width height etc.) indicate in. and/or ft. | | BOILER CAPACITY (indicate ht surface, lbs/h btu/h etc.) | YEAR BUILT |
| 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



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

JIM BENNETT
COMMISSIONER



Permit Request to Install Boiler or Pressure Vessel
(ONE OBJECT PER REQUEST WITH \$ 50.00 FEE)

| | | | |
|----------------------|---------------------------------|---------------------------------------|---|
| Type of Installation | New <input type="checkbox"/> | Used <input type="checkbox"/> | |
| Type of Object | Boiler <input type="checkbox"/> | Water Heater <input type="checkbox"/> | Pressure Vessel <input type="checkbox"/> (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 <input type="checkbox"/> Power Boiler (over 15 psi steam) HLW <input type="checkbox"/> Water Heaters (over 200,000btu and/or 120 gals) H <input type="checkbox"/> Heating Boilers/Hot Water Supply Boilers M <input type="checkbox"/> Miniature Boiler (not to exceed 100 psi steam) U <input type="checkbox"/> 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 | |

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END OF SECTION 15400

SECTION 15800 - HEATING, VENTILATION AND AIR CONDITIONING

PART 1 – GENERAL

GENERAL REQUIREMENTS

The General Conditions, Supplementary Conditions and Division 1, General Requirements, apply.

CODES, FEES, PERMITS

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.

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.

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:

ASHRAE, 2012 "HVAC Systems and Equipment" – Chapter 19, Duct Construction
SMACNA Standards for Duct Construction
International Building Code – 2021
International Mechanical Code – 2021
International Fire Protection Code – 2021
NFPA-90A (2009) – Installation of Air Conditioning and Ventilation Systems
Local Municipal Codes

RELATED WORK SPECIFIED ELSEWHERE IN THE SPECIFICATIONS

General Requirements for Mechanical Work – Section 15100

Test and Balance – Section 15200

Plumbing – Section 15400

Energy Management Control System and Direct Digital Controls – Section 15950

Electrical – Division 16000

RESPONSIBILITY OF BIDDER

Prior to bid, 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.

SUB-DIVISIONS OF WORK

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.

DRAWINGS

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.

Contractor shall provide all fittings and accessories as necessary for a complete installation, whether or not specifically mentioned or shown.

FOUNDATIONS

The Contractor shall furnish all special foundations and supports for air devices and ductwork which he installs.

SAFETY PROVISIONS

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.

NOISE AND VIBRATION

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.

PAINTING

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.

TESTS AND GUARANTEES

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.

The Contractor shall repeat operational sequence during heating and/or cooling season, whichever had not been subject to prior test period.

SHOP DRAWINGS

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".

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.

Wall Mounted Electric Unit Heaters
Ductless Ceiling Mounting Mini-Split Heat Pump Unit
Ducted Mini-Split Heat Pump Unit
Ductwork
Grilles, Registers, & Diffusers
Exhaust Fans
Insulation
Air Purification Devices

QUALITY OF MATERIALS AND EQUIPMENT

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.

Approvals of equipment is 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.

SUBMITTALS

Product Data: Submit manufacturer's latest published product data for all materials for approval. See Section 15100.

PRODUCT DELIVERY, STORAGE AND HANDLING

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

SHEETMETAL DUCTWORK

Ductwork – Low Pressure

This part of the specification shall apply to all low pressure rectangular shop fabricated ductwork for 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.

The Mechanical Contractor shall coordinate with the General Contractor all ductwork penetrations of walls which require lintels.

The following weights of materials, types of joints and bracing shall be followed for sheetmetal ductwork.

| Steel U.S. Std. Gauge | Maximum Size Inches | Type of Transverse Joint Conn. | 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 | 1 x 1 x 1/8" angle |
| 20 | 30 and greater | S-Drive, pocket or bar clips on 7"-10" centers | 1 x 1 x 1/8" angle |

The following details of duct construction shall be adhered to without deviation:

Longitudinal seams for metal shall be Pittsburgh lock.

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.

Provide vanes at all elbows. Provide splitter dampers and turning vanes at duct tees. Horizontal ducts shall be hung at intervals not exceeding 8'-0" with 18-gauge galvanized iron hangers extending the full height of the duct. The only exception shall be for double wall ductwork in the Gymnasium. Truss spans are 9'6" and duct shall be reinforced to suspend this distance without sagging.

Shop drawings of all ductwork when for any reason different from drawings shall be submitted to the Architect for approval.

All ductwork shall be fabricated in strict accordance with SMACNA Construction Standards for Low Velocity Ductwork. All seams shall be caulked or taped to prevent air leakage.

INSULATIONS

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.

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.

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.

The following service shall be insulated with the listed thickness of materials:

| SERVICE | INSULATION MATERIAL | THICKNESS | FINISH |
|--|--|-----------|--------------------------|
| Single Wall Spiral Round, Flat Oval, and *Rectangular Ductwork | 1 lb. density blanket fiberglass duct Minimum R=6.0 | 2" | Reinforced aluminum foil |

* Rectangular Duct includes all supply, return, exhaust, transfer and outside air duct.

All Armaflex insulation shall be slipped over piping with all joints sealed with an approved mastic.

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.

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.

It shall be the responsibility of the insulating subcontractor to coordinate hanger locations and prevent crushing or breaking finishes.

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.

Interior lined rectangular supply ductwork from air handling units shall be wrapped with 1 LB density insulation from point of unit connection to point of exterior duct wrap. Insulation shall be attached with mechanical stick pin fasteners in addition to cement.

Pipe insulation shall have tightly butted joints, taped seams to cover the entire system, including air vents.

Contractor has the option to use FSK tape at joints on wrap insulation in lieu of mastic.

DRAIN CONNECTIONS

Provide drain connection with P-trap of appropriate depth for system operating pressure for the packaged air conditioning units. Drain piping shall be Type 'L' copper or Schedule 40 PVC pipe with drainage pattern fittings and cement mastic joints. Slope piping at 1/4" per foot to point of disposal on grade.

FANS

All fans shall bear the AMCA Seal of Approval and shall be currently listed in the AMCA Directory.

Ceiling/cabinet type exhaust fans shall have 1/2" thick acoustical lined steel housing, direct drive centrifugal fan, back-draft damper, and integral aluminum ceiling grille. Plastic grilles will not be acceptable. Fans shall be designed for ceiling mounting with factory fabricated collar for termination where indicated. Fans shall have capacities as scheduled on drawings and shall be controlled as indicated. Provide speed control switches for all direct drive fans. Fans shall be provided with plug-in type disconnect switch. Include step-down transformer where required for proper power connections. Ceiling mounted fans shall be equal to Greenheck SP model.

Sidewall Propeller Fan

All sidewall fans shall be direct drive axial type. Fan shall be installed as a premanufactured assembly with louver and room side guard. Propellers shall be constructed with die formed steel. Propellers shall be statically and dynamically balanced.

Motors shall be permanently lubricated, heavy duty, ball bearing type and furnished at the specified voltage, phase, and enclosure.

A ground and polished steel fan shaft shall be mounted in permanently lubricated, sealed ball bearing pillow blocks. Drives shall be sized for a minimum of 150% of driven horsepower.

Bearings shall be selected for a minimum average life in excess of 200,000 hours at maximum cataloged operating speed.

The motor pulley shall be adjustable for final system balancing.

The drive frame assembly shall be of formed steel construction.

Fans shall be for exhaust as manufactured by Greenheck, Loren Cook, or approved equal.

Provide fan as a premanufactured assembly with backdraft damper, insect screen and room side guard.

Acceptable manufacturers shall be ACME, Greenheck, Loren Cook, Twin City, and Penn.

GRILLES, REGISTERS, & DIFFUSERS

Location of ceiling mounted type, sidewall type and floor mounted type air devices shall be as shown on plans. Install and fasten air distribution devices per manufacturer's detailed drawings. Use gaskets to make air-tight joints with adjoining construction. All air devices shall be sized not to exceed a N.C. level of (25).

Ceiling diffusers shall be equal to Titus series TDC-AA- adjustable type with 24" x 24" lay-in panel with opposed blade balancing damper of size and capacity as indicated on drawings. Provide with square to round duct connection. Round duct connection and face size shall be as shown on plans. Delete panel for ceiling diffusers installed in rigid ceilings. Ceiling surface mounted diffusers shall have a beveled drop face border type frame. Finish shall be off-white color.

Ceiling mounted return and transfer air grilles shall be equal to Titus Series 50F. Grilles shall be of aluminum construction with a 1/2"x1/2"x1/2" aluminum grid. Grille shall have a 90% free area (minimum). Provide with opposed blade damper (except for transfer/pressure relief). Border shall have countersunk screw holes for a neat appearance. Sizes shall be as indicated on plans. Finish shall be off-white color.

Location of ceiling mounted air distribution devices shall be coordinated with the architectural reflected ceiling plan. Install and fasten ceiling diffuser and return air grilles as per manufacturer's detailed drawings, use gaskets to make airtight joints with adjoining construction, join neatly with adjoining finished surface.

Acceptable manufacturers are Carnes, Nailor, Greenheck, Metal-aire, Titus, Price, or an approved equal.

SPLIT SYSTEM AIR CONDITIONING UNIT (Ductless Ceiling Mounted Type Unit)

The heat pump system shall be mini-split type. The system shall consist of a compact ceiling mounted indoor fan coil section and a slim silhouette horizontal discharge outdoor unit which shall be of an inverter driven heat pump design.

Units shall be tested by a Nationally Recognized Testing Laboratory and shall bear the ETL label. All wiring shall be in accordance with the NEC. Units shall be rated in

accordance with AHRI 240 and bear the AHRI Certification label. The units shall be manufactured in an ISO 9001 and 14001 facility.

A dry holding charge shall be provided from the factory for the indoor section before shipment. Unit shall be stored and handled according to the manufacturer's recommendations.

The unit shall have a manufacturer's parts and defects warranty for a period of five (5) years from date of installation. The compressor shall have a seven (7) year warranty from the same date of installation. Warranty does not include labor.

System performance shall meet the scheduled capacities and efficiencies.

The indoor unit shall be factory assembled, wired, and run tested and include all factory wiring, piping, control circuit board, fan, and fan motor. The unit shall have a self diagnostic function, 3-minute time delay, and an auto restart function after a power interruption. Indoor unit cabinet shall have a smooth front and white finish with multi-directional and refrigerant piping connections. The indoor unit shall have a separate metal installation plate to secure to the wall. Indoor unit fan shall be direct driven via a single motor. Fan shall be statically and dynamically balanced and have permanently lubricated bearings. Airflow direction shall be adjusted with manually adjustable guide vanes. Fan shall have multiple speed settings. Indoor unit sound level shall not exceed 33 dBA at Low airflow setting. The airflow shall be filtered with an easily removable, washable, pleated type filter. The coil shall be of non-ferrous construction with smooth plate fins on copper tubing. Tubing shall have inner grooves for heat exchange. All tube joints shall be brazed with phosphor copper or silver alloy. Coils shall be pressure tested at the factory. Provide with a sloped, corrosion resistant drain pan under the coil. Indoor unit shall have a drain pan level switch to shut unit down prior to condensate overflow. Electrical power shall be for 208-230V, single phase and be directly powered from the outdoor unit. Indoor unit shall be controlled by a wall mounted thermostat.

The outdoor unit shall be specifically designed to work with the indoor unit(s). Outdoor unit shall have a thermally fused powder coat finish and be completely factory assembled, piped, and wired. Unit shall be run tested at the factory. Outdoor unit cabinet shall be of galvanized steel construction, bonderized, and finished with an electrostatically applied, thermally fused acrylic or polyester powder coating for corrosion protection. Assembly hardware shall be cadmium plated for weather resistance. Unit shall have two steel mounting feet with four(4) slotted mounting holes. Assembly shall withstand lateral wind loads up to 155 MPH. The outdoor fan shall be direct driven, propeller type. Fan shall have permanently lubricated bearings and be mounted for quiet operation. Unit shall have a raised guard to prevent contact with moving fan parts. Outdoor unit shall have horizontal discharge airflow. Unit shall not exceed 54 dBA in cooling mode. Outdoor coil shall be of non-ferrous construction with either lanced or corrugated plate fins on copper tubing. Refrigerant from outdoor unit shall be regulated with an electronically controlled expansion valve. Refrigerant type shall be R-410A. Unit shall be pre-charged for 25 feet of piping. All refrigerant lines shall be of annealed copper tubing, individually insulated with closed cell insulation. Refrigerant connections between indoor and outdoor units shall be flare type. The compressor shall be hermetic type, inverter driven, variable speed type. Compressor motor shall be direct current type equipped with a factory supplied and installed inverter drive package. Unit shall be equipped with an accumulator. Compressor

shall have thermal overload protection and be mounted so as to avoid vibration transmission. Electrical power shall be for 208-230V, single phase.

Acceptable manufacturers shall be Mitsubishi, Daikin, LG, or approved equal.

MINI-SPLIT AIR CONDITIONING UNIT OUTDOOR SECTION

General

The outdoor units are specifically designed to work with the indoor vertical mounted air handling unit. The connected indoor unit shall be of the same capacity as the outdoor unit. The outdoor units must have a thermally fused powder coated finish. The outdoor unit shall be completely factory assembled, piped and wired. Each unit shall be run tested at the factory.

Refrigerant lines from the outdoor unit to the indoor units shall be insulated in accordance with the installation manual.

The outdoor unit shall meet performance requirements per schedule and be within piping limitations & acceptable ambient temperature ranges as described in respective manufacturers' published product catalogs. Non-published product capabilities or performance data are not acceptable.

The outdoor unit shall be capable of guaranteed operation in heating mode down to -13°F ambient temperatures and cooling mode up to 115°F without additional restrictions on line length & vertical separation beyond those published in respective product catalogs.

The outdoor unit shall be provided with a manufacturer supplied 20 gauge hot dipped galvanized snow /hail guard.

Four-legged outdoor unit mounting systems shall be provided by manufacturer. Stand shall be made from 7 gauge plate steel with thermally fused polyester powder coat finish that meets ASTM D3451-06 standards. Stands shall be provided with galvanized mounting hardware and meets all ASCE 7 overturning safety requirement.

The outdoor unit shall be provided with a manufacturer supplied 20 gauge hot dipped galvanized wind baffle. The wind baffle shall allow for continuous cooling to 0FDB without any additional modifications to the unit.

Unit Cabinet

The casing shall be fabricated of galvanized steel, bonderized, finished with an electrostatically applied, thermally fused acrylic or polyester powder coating for corrosion protection. Assembly hardware shall be cadmium plated for weather resistance.

Easy access shall be afforded to all serviceable parts by means of removable panel sections.

The casing(s) shall be fabricated of galvanized steel, bonderized and finished.

Assembly shall withstand lateral wind gust up to 155 MPH to meet applicable weather codes.

Outdoor unit components shall be coated with the Seacoast Protection Coating (Brine Spray – BS coating) to protect components from premature corrosion due to a seacoast environment. Coating shall be applied to components before original outdoor unit assembly to ensure manufacturer quality standards are not compromised and shall meet the following minimum requirements:

Acrylic-Polyester Resin coating on External Panels

Acrylic Resin coating on External Panel Base, Support Plate and Compressor Cover

Anti-Corrosion, Hydrophilic coating on heat exchanger fins

Anti-Humidification paint coating on printed circuit boards

The outdoor unit shall be tested in compliance with JRA9002 such that no unusual rust shall develop after 960 hours of salt spray testing.

Panels on the outdoor unit shall be scratch free at system startup. If a scratch occurs the salt spray protection is compromised and the panel should be replaced immediately.

Fan

Units shall be furnished with a single or two (2) direct drive propeller type fan subject to tonnage and manufacturer.

The outdoor unit fan motor(s) shall be a direct current (DC) motor and have permanently lubricated bearings.

The fan motor shall be mounted for quiet operation.

The fan shall be provided with a raised guard to prevent contact with moving parts.

The outdoor unit shall have horizontal discharge airflow.

Refrigerant and Refrigerant Piping

R410A refrigerant shall be required for systems.

Polyolester (POE) oil shall be required.

Refrigerant piping shall be phosphorus deoxidized copper (copper and copper alloy seamless pipes) of sufficient radial thickness as defined by the equipment manufacturer and installed in accordance with manufacturer recommendations.

All refrigerant piping must be insulated with 1/2" closed cell, CFC-free foam insulation with flame-Spread Index of less than 25 and a smoke-development Index of less than 50 as tested by ASTM E 84 and CAN / ULC S-102. R value of insulation must be at least 3.

Refrigerant line sizing shall be in accordance with manufacturer specifications.

Coil

The outdoor unit coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.

The coil shall be protected with an integral metal guard.

Refrigerant flow from the outdoor unit shall be regulated by means of an electronically controlled, precision, linear expansion valve.

All refrigerant lines between outdoor and indoor units shall be of annealed, refrigeration grade copper tubing, ARC Type, meeting ASTM B280 requirements, individually insulated in twin-tube, flexible, closed-cell, CFC-free (ozone depletion potential of zero), elastomeric material for the insulation of refrigerant pipes and tubes with thermal conductivity equal to or better than 0.27 BTU-inch/hour per Sq Ft / °F, a water vapor transmission equal to or better than 0.08 Perm-inch and superior fire ratings such that insulation will not contribute significantly to fire and up to 1" thick insulation shall have a Flame-Spread Index of less than 25 and a Smoke-development Index of less than 50 as tested by ASTM E 84 and CAN / ULC S-102.

All refrigerant connections between outdoor and indoor units shall be flare type.

Compressor

The compressor shall be a high performance, hermetic, inverter driven, variable speed, dual rotary type manufactured by Mitsubishi Electric Corporation or equal.

The compressor motor shall be direct current (DC) type equipped with a factory supplied and installed inverter drive package.

The compressor will be equipped with internal thermal overload protection.

To prevent liquid from accumulating in the compressor during the off cycle, a minimal amount of current shall be automatically, intermittently applied to the compressor motor windings to maintain sufficient heat to vaporize any refrigerant. No crankcase heater is to be used.

Filters, sight glasses, and traps shall not be used, and no additional refrigerant oil shall be required.

The compressor shall be mounted so as to avoid the transmission of vibration.

The outdoor unit shall have an accumulator and high pressure safety switch.

Operating Range

Operating Range shall be in accord with the Table below

| Operating Range | | Indoor Intake Air Temp | Outdoor Intake Air Temp |
|-----------------|---------|----------------------------------|------------------------------------|
| Cooling | Maximum | 95°F (35°C) DB, 71°F(21°C) WB | 115°F (46°C) DB |
| | Minimum | 67°F (19°C) DB, 57°F(14°C) WB | 14°F (-10°C) DB |
| Heating | Maximum | 80°F (27°C) DB, 67°F(19°C) WB | 75°F (24°C) DB, 65°F(18°C) WB |
| | Minimum | 70°F (21°C) DB, 60°F(16°C) WB | 6°F (-14°C) DB, 5°F(-15°C) WB |
| | | | -12°F (-24°C) DB, -13°F(-25°C) WB* |

Electrical

The outdoor unit electrical power supply shall be 240 volts, 1-phase, 60 hertz.

The outdoor unit shall be controlled by microprocessors located in the indoor unit and outdoor unit. A 12 to 24 volt DC data stream shall communicate between the units providing all necessary information for full function control.

The outdoor unit shall be equipped with Pulse Amplitude Modulation (PAM) compressor inverter drive control for maximum efficiency with minimum power consumption.

Basis of Design for Outdoor unit is Mitsubishi NTXSKS30A112AA or approved equal.

MINI-SPLIT INDOOR UNIT EVAPORATOR SECTION

General

The vertical indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function, a test run switch, and the ability to adjust airflow and refrigerant flow for implementing a dehumidification cycle. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

Unit Cabinet

The cabinet panel shall have provisions for a field installed filtered outside air intake.

Branch ducting shall be allowed from cabinet for outdoor air.

Four-way grille shall be fixed to bottom of cabinet allowing two, three or four-way blow.

The grille vane angles shall be individually adjustable from a wired remote controller to customize the airflow pattern for the conditioned space.

The grille shall allow the unit to be serviceable from the bottom, without the need for an access panel

Fan

The indoor fan shall be an assembly with a statically and dynamically balanced turbo fan direct driven by a single motor with permanently lubricated bearings.

The indoor unit shall include an AUTO fan setting capable of maximizing energy efficiency by adjusting the fan speed based on the difference between controller set-point and space temperature. The indoor fan shall be capable of five (5) speed settings, Low, Mid1, Mid2, High and Auto.

The indoor unit shall have an adjustable air outlet system offering 4-way airflow, 3-way airflow, or 2-way airflow.

The indoor unit fan logic must include multiple setting that can be changed to provide optimum airflow based on ceiling height and number of outlets used.

The indoor unit vanes shall have 5 fixed positions and a swing feature that shall be capable of automatically swinging the vanes up and down for uniform air distribution.

The vanes shall have an Auto-Wave selectable option in the heating mode that shall randomly cycle the vanes up and down to evenly heat the space.

Grille shall include a factory-installed sensor, or equal, to work in conjunction with indoor unit control sequence to prevent unnecessary cooling or heating in unoccupied areas of the zone without decreasing comfort levels. Sensor must detect occupancy (not simply motion) and location of occupants by measuring size & temperature of objects within a 39' detecting diameter (based on 8.8ft mounting height) with 1,856 or more measuring points.

Filter

Return air shall be filtered by means of a long-life washable filter.

Filter housing shall install between the unit and the ceiling and allow for additional filtered outside air intake

Filter shall be rated MERV 10 when tested in accordance with ANSI/ASHRAE 52.2 Standard Rated Class 2 under U.L. Standard 900.

Coil

The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phos-copper or silver alloy.

The coils shall be pressure tested at the factory.

The unit shall be provided with an integral condensate lift mechanism that will be able to raise drain water 33 inches above the condensate pan.

Electrical

The unit electrical power shall be 240 volts, 1-phase, 60 hertz.

The unit shall be equipped with a system directing that the indoor unit be powered directly from the outdoor unit using a 3-wire, 14 gauge AWG connections plus ground.

The indoor unit shall not have any supplemental electrical heat elements.

Controls

Indoor unit shall compensate for the higher temperature sensed by the return air sensor compared to the temperature at level of the occupant when in HEAT mode. Disabling of compensation shall be possible for individual units to accommodate instances when compensation is not required.

Control board shall include contacts for control of external heat source. External heat may be energized as second stage when the space temperature is 1.8°F from set point. A factory-installed drain pan sensor shall provide protection against drain pan overflow by sensing a high condensate level in the drain pan. Should this occur the control shuts down the indoor unit before an overflow can occur.

Control capability shall include a built-in dehumidification cycle.

Basis for design is Mitsubishi NTXAMT30A112AA or approved equal.

WALL MOUNTED ELECTRIC HEATER

Contractor shall provide and install heavy duty fan-forced wall heater where shown on plans and of capacities as indicated. Heater shall have spiral finned metal sheathed elements. Spiral fins shall be brazed to sheath to insure proper heat transfer. Safety protection shall be provided by an automatic reset wired in heater circuit to deenergize element and motor circuit in case of an over temperature condition. Heater fan and motor shall be sized to deliver at least 210 CFM to insure proper heat circulation. Motor shall be totally enclosed and permanently lubricated. Motor circuit shall have fan delay to insure heated air delivery when heater comes on and to dissipate heat when heater turns off. Heater shall have built-in thermostat and disconnect switch with either tamper proof control knobs or exposed control knobs as listed on schedule. Heater shall have fan only mode switch for summer air circulation. Heater grill and frame shall be constructed of heavy gauge die-formed steel bonderized and painted with a heavy coat of industrial grade baked enamel. Wall heater shall be UL listed and shall be installed in accordance with manufacturer's instructions and with all National and Local Electrical Codes. Heavy duty wall heater shall be by Markel - Series 3400.

LOUVERS

Louvers shall be stationary type. Furnish and install louvers as hereinafter specified where shown on plans. Louvers shall be "Stationary Drainable" type with a drain gutter in each blade and down spots in jambs and mullions. Stationary drainable blades shall be contained within a single 6" frame.

Louver components (heads, jambs, sills, blades, and mullions) shall be factory assembled by the louver sections to provide overall sizes required.

Construction shall be of extruded aluminum alloy as follows:

Frame: .125" wall thickness

Blades: .125" wall thickness at 37½° angle on approximately 4 1/2" centers

Screen: 3/4" x .051" expanded flattened aluminum in removable frame.

Wind Loads: Basic Wind Speed: 135 mph(60 m/s)

Importance Factor: 1.15.

Exposure Category: B.

Submittals

Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of louver assembly.

Wind-Borne Debris – Impact Resistance Performance: Notice of Acceptance from Miami-Dade Building Code Compliance Office or Certification of Compliance from other testing laboratories approved by the State of Florida under the Florida Building code.

Quality Assurance - Louver units indicated for exterior locations shall be designed to comply with the requirements of the High-Velocity Hurricane Zone of the 2017 Florida Building Code. Notice of Acceptance from Miami-Dade Building Code compliance Office or certification from other testing laboratories approved by the State of Florida under the Florida Building Code shall be provided for review

Aluminum Finishes - High-Performance Organic Finish: 3-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Color and Gloss: As selected by Architect from manufacturer's full range.

Published louver performance data bearing the AMCA Certified Ratings Seal for Air Performance & Water Penetration must be submitted for approval. Provide birdscreen and flanged frame. Provide baked enamel finish with color as selected by Architect. Louvers shall be Ruskin Model ELF 6375DXD or equal by American Warming, Arrow United Industries, Dowco, Greenheck, Industrial Louvers, Louvers and Dampers, or Nailor-Hart.

Motorized dampers shall be low leakage type dampers similar to Ruskin - Model CD-50.

AIR PURIFICATION DEVICE (BI-POLAR IONIZATION)

Quality Assurance

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.

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.

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.

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.

Submittals

Submit manufacturer's technical product data for ion generators including:

Schedule of plasma generators indicating unit designation, number of each type required for each unit/application.

Data sheet for each type of plasma generator, and accessory furnished; indicating construction, sizes, and mounting details.

Performance data for each type of plasma device furnished.

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.

Product drawings detailing all physical, electrical, and control requirements.

Copy of UL 867 independent ozone test.

Delivery, Storage, & Handling

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.

Warranty

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.

General

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.

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.

Design & Performance Criteria

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.

The bi-polar ionization system shall be capable of:

Effectively killing microorganisms downstream of the bi-polar ionization equipment (mold, bacteria, virus, etc.).

Controlling gas phase contaminants generated from human occupants, building structure and furnishings.

Capable of reducing static space charges.

Increasing the interior ion levels, both positive and negative, to a minimum of 800 ions/cm³ measured 5 feet from the floor.

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. 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.

The air purification device shall not have maximum velocity profile.

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.

Equipment Requirements

Electrode specifications:

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.

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.

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.

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.

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.

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.

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.

The ionization output shall be controlled such that an equal number of positive and negative ions are produced. Imbalanced levels shall not be acceptable.

Ionization output from each electrode shall be a minimum of 140 million ions/cc when tested at 1" from the ionization generator.

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:

MRSA - >96% in 30 minutes or less

E.Coli - >99% in 15 minutes or less

TB - >69% in 60 minutes or less

C.diff - >86% in 30 minutes or less

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.

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.

Electrical Requirements: 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.

Control Requirements

All plasma generators shall have internal short circuit protection, overload protection, and automatic fault reset.

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.

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.

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.

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.

Execution

The Contractor shall be responsible for maintaining all air systems until the Owner accepts the building.

All equipment shall be assembled and installed in a workman like manner to the satisfaction of the Owner, Architect, and Engineer.

Any material damaged by handling, water, or moisture shall be replaced by the mechanical contractor at no cost to the Owner.

All equipment shall be protected from dust and damage on a daily basis throughout construction.

Provide the manufacturer's recommended electrical tests.

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.

Acceptable manufacturers shall be Top Product Innovations, Global Plasma Solutions, or approved equal.

PARTICULATE AIR FILTRATION BY NATURAL CONVERSION PROCESS

General

As an alternative to bi-polar ionization air purification device, air purification may be provided by natural conversion processes.

Summary

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.

Definitions

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.

NELAP - National Environmental Laboratory Accreditation Program.

Submittals

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.

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.

Product Test Reports: For each NCC Device, for tests performed by a qualified third-party testing agency and customer.

Field quality-control reports.

Closeout Submittals: Operation and Maintenance Data: For each type of NCC Device to include, operation, and maintenance manuals.

Maintenance Material Submittals: Any extra materials furnished that match products/sub-components installed shall be packaged with protective covering for storage and identified with labels describing contents.

Quality Assurance

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.

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.

Technologies that do not address gas disassociation such as UV Lights, Powered Particulate Filters and/or polarized media filters are not acceptable.

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.

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.

Products

General

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.

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.

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 (H₂O₂) 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.

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:

MRSA > 99.98% in 6 hours

Fungi > 95% in 6 hours

Influenza (H1NI) > 99.93% in 6 hours

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.

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 (O ₃) – 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.

Execution

Examination:

Examine NCC units and conditions for compliance with requirements for installation

tolerances and other conditions affecting performance of the Work.
Proceed with installation only after unsatisfactory conditions have been corrected.

Installation: Position each NCC unit within existing duct work or within the ceiling, utilizing manufacturer's clearance for normal service and maintenance. Anchor electronic NCC units to substrate per manufacturer's written recommended installation procedures.

Control Connections:

Install control and electrical power wiring to field-mounted control devices.
Connect control wiring between controlled devices.

Field Quality Control:

Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
Perform any desired tests and inspections with the assistance of a factory-authorized service representative.

Cleaning: 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.

Protection: Protect installed products and accessories from damage during construction.

PART 3 – EXECUTION

TESTING OF PIPING SYSTEMS

General: Contractor shall notify Architect/Engineer of tests twenty-four hours in advance. All tests shall be witnessed by the Architect/Engineer 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.

The following systems shall be tested at pressures indicated: Drain piping - 10 psi

All tests shall be verified by a test record maintained on the site and witnessed by the signature of inspector.

Any portion of system failing to pass test shall be retested until proven acceptable.

GUARANTEE

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.

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.

Under the guarantee clause, the Contractor shall include free routine maintenance for a period of one (1) year from the date of final acceptance. At the end of one year of operation, the Contractor and mechanical subcontractor shall inspect and repair any problems which may exist. Contractor shall lubricate bearings, adjust or replace belts, replace filters, and provide all necessary preventative and corrective maintenance required. Contractor shall provide Engineer with a table identifying each air handling unit model and serial number, quantity and size of filters, filter manufacturer and efficiency, belt manufacturer and size, motor HP, frame, and power supply.

END OF SECTION 15800

SECTION 15950 – ENERGY MANAGEMENT CONTROL SYSTEM AND DIRECT DIGITAL CONTROLS

PART 1 – GENERAL

WORK INCLUDED

General: Building Management System (BMS) Contractor shall provide and install:

Complete temperature control system to be DDC with electric actuation as specified herein.

All wiring, conduit, panels, and accessories for a complete operational system.

BMS Contractor shall be responsible for all electrical work associated with the BMS.

Perform all wiring in accordance with all local and national codes.

Install all line voltage wiring, concealed or exposed, in conduit in accordance with the Division 16 specifications, NEC and local building code.

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.

Surge transient protection shall be incorporated in design of system to protect electrical components in all DDC Controllers and operator's workstations.

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.

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.

GENERAL PRODUCT DESCRIPTION

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.

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.

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.

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.

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.

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 for which the operator is authorized. 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.

RELATED SECTIONS

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.

The following sections constitute related work:

Section 15100 – General Requirements
Section 15200 – Testing, Adjusting, and Balancing for HVAC
Section 15400 – Plumbing
Section 15800 – HVAC
Section 16100 -- Electrical
Section 16720 – Fire Detection and Alarm Systems

APPROVED CONTROL SYSTEM PRODUCTS AND CONTRACTOR

The following is the only acceptable Control System Product: Siemens TALON Automation System

The following are the approved Control System Contractors:

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.

The new BAS system installed shall communicate to the Existing Baldwin County Board of Education Tridium N4 Supervisor Graphical Workstation

The new BAS system shall tie into existing Tridium N4 Supervisor via BACnet IP
All graphics for new BAS system shall be developed for the Tridium N4. Graphics should include individual graphics for each piece of equipment and any integrated equipment.

QUALITY ASSURANCE

The BAS system shall be designed and installed, commissioned and serviced by factory trained personnel. BAS contractor shall be Siemens Value Added Partner or Siemens Branch. 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.

The BMS contractor shall have a minimum of Three (3) Tridium N4 Certified technicians and Three (3) Siemens Certified technicians.

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.

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.

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.

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.

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.

All electronic equipment shall conform to the requirements of FCC Regulation, Part 15, Governing Radio Frequency Electromagnetic Interference and be so labeled.

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.

CODES & STANDARDS

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:

National Electric Code (NEC)
International Building Code (IBC) - 2021
International Mechanical Code (IMC) - 2021
Local Building Code

SUBMITTALS

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.

Provide submittals within 4 weeks of contract award.

Submittal data shall consist of the following:

Direct Digital Control System Hardware

Complete bill of materials indicating quantity, manufacturer, model number, and relevant technical data of equipment to be used.

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

Wiring diagrams and layouts for each control panel. Show all termination numbers.

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.

Contractor shall submit documentation in the following phased delivery schedule:

Valve and damper schedules
Point Naming Convention
Sample Graphics
System Schematics, including:
System Riser Diagrams
Sequence of Operations
Mechanical Control Schematics
Electrical Wiring Diagrams
Control Panel Layouts
Product Specification Sheets
As-Built drawings

Project Record Documents

Submit three (3) copies of record (as-built) documents upon completion of installation. Submittal shall consist of:

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.

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.

Certification of pressure test required in the *Control Air Tubing* section in *PART 3 – EXECUTION* of this specification.

Operation and Maintenance (O & M) Manual.

As-built versions of the submittal product data.

Names, addresses, and 24-hour telephone numbers of installing contractors and service representatives for equipment and control systems.

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.

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.

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.

Documentation of all programs created using custom programming language, including setpoints, tuning parameters, and object database.

Graphic files, programs, and database on electronic media..

List of recommended spare parts with part numbers and suppliers.

Complete original-issue documentation, installation, and maintenance information for furnished third-party hardware, including computer equipment and sensors.

Complete original original-issue copies of furnished software, including operating systems, custom programming language, operator workstation software, and graphics software.

Licenses, guarantees, and warranty documents for equipment and systems.

WARRANTY

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.

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.

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.

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.

Exception

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.

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.

OWNERSHIP & PROPRIETARY MATERIAL

Project specific software and documentation shall become Owner's property. This includes, but not limited to:

Graphics
Record drawings
Database
Application programming code
Project Specific Documentation shall become Owner's property.

General

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.

Submit four (4) copies of owner's manuals upon completion of project.

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.

Update manuals with modifications made to system during guarantee period. Provide replacement pages or supplements in quantity stated above for "as-built" manuals.

Assemble owner's manuals into multi-volume sets as necessary and required by the owner.

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.

Each binder to be printed with project name and volume title on front cover and binder.

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.

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:

Sequence of operation for automatic and manual operating modes for all building systems. The sequences shall cross-reference the system point names.
Description of manual override operation of all control points in system.
BMS system manufacturers complete operating manuals.

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:

Complete as-built installation drawings for each building system.
Overall system electrical power supply schematic indicating source of electrical power for each system component. Indicate all battery backup provisions.
Photographs and/or drawings showing installation details and locations of equipment.
Routine preventive maintenance procedures, corrective diagnostics troubleshooting procedures, and calibration procedures.
Parts list with manufacturer's catalog numbers and ordering information.
Lists of ordinary and special tools, operating materials supplies and test equipment recommended for operation and servicing.
Manufacturer's operation, set-up, maintenance and catalog literature for each piece of equipment.
Maintenance and repair instructions.
Recommended spare parts.
Provide Programming Manual to serve as training and reference manual for all aspects of system programming. As a minimum include the following:
Complete programming manuals, and reference guides.
Details of any custom software packages and compilers supplied with system.
Information and access required for independent programming of system.

PART 2 – PRODUCTS

MATERIALS

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.

COMMUNICATION

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.

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.

Primary Network - Panel to Panel Communication

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.

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.

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.

The primary network shall use TCP/IP over Ethernet. All devices must:

Auto-sense 10/100 Mbps networks.

Receive an IP Address from a Dynamic Host Configuration Protocol (DHCP) Server or be configured with a Fixed IP Address.

Resolve Name to IP Addresses for devices using a Domain Name Service (DNS) Server on the Ethernet network.

Allow MMI access to an individual Primary Network Controller using industry standard Telnet software to view and edit entire Primary Network.

The primary network shall provide the following minimum performance:

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.

Message and alarm buffering to prevent information from being lost.

Error detection, correction, and re-transmission to guarantee data integrity.

Synchronization of real-time clocks between Building Controllers, including automatic daylight savings time corrections.

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.

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.

Devices containing custom programming must reside on the Primary Network.

Secondary Network – Application Specific Controller Communication

Communication over the secondary network shall be BACnet MS/TP protocol.

This level communication shall support a family of application specific controllers for terminal equipment.

The Application Specific Controllers shall communicate bi-directionally with the primary network through Building Controllers for transmission of global data.

A maximum of 50 terminal equipment controllers may be configured on individual secondary networks to ensure adequate global data and alarm response times.

BUILDING CONTROLLER SOFTWARE

Furnish the following applications software to form a complete operating system for building and energy management as described in this specification.

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.

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.

All digital points shall have a user defined two-state status indication with 8 characters minimum (e.g., Summer, Enabled, Disabled, Abnormal).

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.

The Building Controllers shall have the ability to perform the following pre tested control algorithms:

- Two position control
- Proportional control
- Proportional plus integral control
- Proportional, integral, plus derivative control
- Automatic tuning of control loops
- Model-Free Adaptive Control

Each controller shall be provided with an interactive HELP function to assist operators using POTs and remote connected operators.

SYSTEM SECURITY

User access shall be secured using individual security passwords and user names.

Passwords shall restrict the user to the objects, applications, and system functions as assigned by the system manager.

User Log On/Log Off attempts shall be recorded.

The system shall protect itself from unauthorized use by automatically logging off following the last keystroke. The delay time shall be user-definable.

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.

USER DEFINED CONTROL APPLICATIONS

Controllers shall be able to execute custom, job-specific processes defined by the user, to automatically perform calculations and special control routines.

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.

Any process shall be able to issue commands to points in any and all other controllers in the system.

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.

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.

Controller shall provide a HELP function key, providing enhanced context sensitive on-

line help with task oriented information from the user manual.

ALARM MANAGEMENT

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.

Conditional alarming shall allow generation of alarms based upon user defined multiple criteria.

An Alarm "shelving" feature shall be provided to disable alarms during testing. (Pull the Plug, etc.).

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.

Analog Alarms: Each analog object shall have both high and low alarm limits. Alarming must be able to be automatically and manually disabled.

All alarm or point change reports shall include the point's user defined language description and the time and date of occurrence.

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.

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.

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.

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.

Operator-selected alarms shall be capable of initiating a call to a remote operator device.

SCHEDULING

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.

Schedules shall reside in the building controller and shall not rely on external processing or network.

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.

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.

The operator shall be able to define the following information:

Time, day

Commands such as on, off, auto, etc.

Time delays between successive commands.

There shall be provisions for manual overriding of each schedule by an authorized operator.

It shall be possible to schedule calendar-based events up to one year in advance based on the following:

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.

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.

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.

Automatic Daylight Savings Time Switchover: The system shall provide automatic time adjustment for switching to/from Daylight Savings Time.

Night setback control. The system shall provide the ability to automatically adjust setpoints for night control.

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.

Sequencing

Provide application software based upon the sequences of operation specified to properly sequence equipment.

Staggered Start

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.

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.

Totalization

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.

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.

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.

Data Collection

A variety of historical data collection utilities shall be provided to manually or automatically sample, store, and display system data for all points.

Building Controllers shall store point history data for selected analog and digital inputs and outputs:

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.

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.

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.

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).

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.

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.

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.

BUILDING CONTROLLERS

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.

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.

Provide Universal I/O capability, including software configurable universal inputs and universal outputs.

Each Building Controller shall support a minimum of one directly connected Secondary Network.

Building Controller shall have an integral real-time clock.

Each Building Controller shall support firmware upgrades without the need to change hardware.

Each Building Controller shall support:

Monitoring of industry standard analog and digital inputs, without the addition of equipment outside the Building Controller cabinet.

Monitoring of industry standard analog and digital outputs, without the addition of equipment outside the Building Controller cabinet.

Spare Point Capacity

Each Building Controller shall have a minimum of 10 percent spare point capacity.

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.

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:

Expansion modules
Sensor/actuator
Field wiring/tubing

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.

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.

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.

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.

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..

Environment

Controller hardware shall be suitable for the anticipated ambient conditions.

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).

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).

Immunity to power and noise

Controller shall be able to operate at 90% to 110% of nominal voltage rating and shall perform an orderly shutdown below 80% nominal voltage.

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).

Isolation shall be provided at all primary network terminations, as well as all field point terminations to suppress induced voltage transients consistent with:

RF-Conducted Immunity (RFCl) per ENV 50141 (IEC 1000-4-6) at 3V

Electro Static Discharge (ESD) Immunity per EN 61000-4-2 (IEC 1000-4-2) at 8 kV air discharge, 4 kV contact

Electrical Fast Transient (EFT) per EN 61000-4-4 (IEC 1000-4-4) at 500V signal, 1 kV power

Output Circuit Transients per UL 864 (2,400V, 10A, 1.2 Joule max)

Isolation shall be provided at all Building Controller's AC input terminals to suppress induced voltage transients consistent with:

IEEE Standard 587 1980

UL 864 Supply Line Transients

Voltage Sags, Surge, and Dropout per EN 61000-4-11 (EN 1000-4-11)

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.

Minimum Approved Building Controllers

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.

Siemens Industry, Inc. - PXC Compact Controllers, PXC Modular Controllers.

APPLICATION SPECIFIC CONTROLLERS (ASC)

Provide for control of each piece of equipment, including, but not limited to the following:

Fan Coil Units

VAV Terminal Units

CV Terminal Units

Each Application Specific Controller shall support:

Each Building Controller shall be able to communicate with application specific controllers (ASCs) over the Secondary Network to control terminal equipment only.

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.

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.

Space Temperature Sensors

Each controller performing space temperature control shall be provided with a matching room temperature sensor.

Wired temperature sensor specifications

The sensing element for the space temperature sensor must be IC-based and provide the following:

Digitally communicating with the Application Specific Controller.

Mountable to and fully covering a 2 x 4 electrical junction box without the need for an adapter wall plate.

IC Element Accuracy: +/- 0.9°F

Operating Range: 55 to 95°F

Setpoint Adjustment Range: User limiting, selectable range between 55 and 95°F

Display of temperature: setpoint with numerical temperature values

Calibration: Single point, field adjustable at the space sensor to +/- 5°F

Installation: Up to 100 ft. from controller

Auxiliary Communications Port: included

Local OLED Temperature Display: included

Display of Temperature: to one decimal place

Temperature Setpoint Adjustment: included

Occupancy Override Function: included

Setpoint Modes: Independent Heating, Cooling; Night Setback-Heating; Night Setback-Cooling

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.

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.

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.

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.

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.

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.

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.

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.

Memory

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.

Upon replacement, new ASCs shall recover control function and site specific defaults automatically and resume normal operation.

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:

The existing line voltage power trunk and installing separate isolation transformers for each controller.

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.

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.

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).

INPUT/OUTPUT INTERFACE

Hardwired inputs and outputs may tie into the system through building or application specific controllers.

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.

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.

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.

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.

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.

24 Vdc shall be available next to the point signal for powering the output device.

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.

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.

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.

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.

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.

POWER SUPPLIES & LINE FILTERING

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.

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.

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.

Line voltage units shall be UL recognized and CSA approved.

Power line filtering

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:

Dielectric strength of 1000 volts minimum

Response time of 10 nanoseconds or less

Transverse mode noise attenuation of 65 dB or greater

Common mode noise attenuation of 150 dB or better at 40 Hz to 100 Hz.

AUXILIARY CONTROL DEVICES

Specified in this section are the following hard wired input/output devices connected to the Building Controller or ASC.

Automatic Dampers

Electric Damper Actuators

Binary Temperature Devices

Temperature Sensors

Dew Point/Humidity Sensors

Indoor Air Quality (CO₂/TEMP/RH) Space Sensors

Current Switches

Local Control panels

Specified in this section are the following devices connected to the BMS using secondary network communication:

Indoor Air Quality (CO₂) Space Sensors

Power Monitors

Automatic Dampers

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 from a rigid assembly where required in galvanized duct work. Dampers shall have blades not more 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.

In copper, aluminum and stainless steel duct work, damper material shall match the duct work material.

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 of 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.

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.

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.

Dampers shall be Greenheck, Imperial Model 800 or approved equal.

Dampers shall be Ruskin Model CD60, Imperial Model 800 or approved equal.

Electric Damper Actuators

General

All actuators shall be manufactured; brand labeled, or distributed by Siemens.

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.

The actuator shall have mechanical or electronic stall protection to prevent damage to the actuator throughout the rotation of the actuator.

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.

Modulating actuator shall accept a 0-10 Vdc control signal and provide a 0-10 Vdc operating range.

All 24 Vac/Vdc actuators shall operate on Class 2 wiring.

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.

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.

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.

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.

Provide built-in dual end switches as required for the sequence of operation.

Control damper actuators shall be RoHS Part A compliant.

Binary temperature devices ID: 319]

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.

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.

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 |

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 |

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 |

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 | +0.5°F |

Dew point/humidity sensors

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 |

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 |

Indoor air quality (CO2/TEMP/RH) sensors

Provide indoor air quality sensors to monitor Carbon Dioxide (CO2), and /or Temperature and Humidity.

The CO2 sensor shall be of microprocessor-based non-dispersive infrared type (NDIR) with an additional integrated reference light source.

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.

The units shall be wall or duct mounted type as indicated on plans and in the sequence of operation.

Wall mounted sensors shall be provided with white plastic cover, without LED indicators.

Duct and Wall mounted sensors shall be suitable for zones with 24/7 occupancy

Duct and Wall mounted sensors with Temperature shall have an option for active or passive temperature outputs (based on part number)

Duct mounted sensors shall be provided with out the need for a separate aspirator box

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. |

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.

Current switches

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.

Local control panels

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.

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.

Provide ON/OFF power switch with overcurrent protection for control power sources to each local panel.

COMMUNICATION & WIRING CONTROL

Provide copper wiring, plenum cable, and raceways as specified in the applicable sections of Division 16 unless otherwise noted herein.

All insulated wire to be copper conductors, UL labeled for 90°C minimum service.

Wire Sizing and Insulation

Wiring shall comply with minimum wire size and insulation based on services listed below:

| Service | Minimum Gage/Type | Insulation Class |
|----------------|--------------------------|-------------------------|
| 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 |

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.

Power Wiring

115V power circuit wiring above 100 feet distance shall use minimum 10 gage.
24V control power wiring above 200 feet distance shall use minimum 12 gage.

Control Wiring

Digital Input/Output wiring shall use Class 2 twisted pair, insulated.

Analog inputs shall use Class 2 twisted shielded pair, insulated and jacketed and require a grounded shield.

Actuators with tri-state control shall use 3 conductor with same characteristics

Communication Wiring

Ethernet Cable shall be minimum CAT5.

Secondary level network shall be 24 gage, TSP, low capacitance cable.

Approved Cable Manufacturers

Wiring from the following manufacturers which meet the above criteria shall be acceptable:

Anixter

Belden

PART 3 – EXECUTION

EXAMINATION

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.

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.

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.

PROTECTION

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.

The contractor shall be responsible for its work and equipment until finally inspected, tested, and accepted.

COORDINATION

Site

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.

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.

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.

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.

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.

Submittals

Refer to the *Submittals* section in *PART 1-GENERAL* of this specification for requirements.

Test and Balance

The contractor shall furnish a single set of all tools necessary to interface to the control system for test and balance purposes.

The contractor shall provide training in the use of these tools. This training will be planned for a minimum of 4 hours.

In addition, the contractor shall provide a qualified technician for duration of 8 hours to assist in the test and balance process.

The tools used during the test and balance process shall be returned at the completion of the testing and balancing.

Life Safety

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.

Coordination with controls specified in other sections or divisions.

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:

All communication media and equipment shall be provided as specified in the *Communication* section in *PART 2 – PRODUCTS* of this specification.

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.

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.

The contractor is responsible for providing all controls described in the contract documents regardless of where within the contract documents these controls are described.

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.

GENERAL WORKMANSHIP

Install equipment, piping, and wiring/raceway parallel to building lines (i.e., horizontal, vertical, and parallel to walls) wherever possible.

Provide sufficient slack and flexible connections to allow for vibration of piping and equipment.

Install all equipment in readily accessible locations as defined by *Chapter 1, Article 100, Part A* of the *National Electrical Code (NEC)*.

Verify integrity of all wiring to ensure continuity and freedom from shorts and grounds.

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.

FIELD QUALITY CONTROL

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.

Contractor shall continually monitor the field installation for code compliance and quality of workmanship.

Contractor shall have work inspected by local and/or state authorities having jurisdiction over the work.

EXISTING EQUIPMENT

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.

WIRING

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.

All NEC Class 1 (line voltage) wiring shall be UL Listed in approved conduit according to NEC and Division 16 requirements.

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.)

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.

All wiring in mechanical, electrical, or service rooms—or where subject to mechanical damage— shall be installed in conduit.

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).

Do not install wiring in conduit containing tubing.

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.

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.

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.

All wiring within enclosures shall be neatly bundled and anchored to permit access and prevent restriction to devices and terminals.

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.

All plenum rated wiring shall be installed as continuous lengths, with no splices permitted between termination points

All wiring in conduit shall be installed as continuous lengths, with no splices permitted between termination points or junction boxes.

Maintain fire rating at all penetrations. Install plenum wiring in sleeves where it passes through walls and floors.

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.

Include one pull string in each conduit 3/4 in. or larger.

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.

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).

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.

Adhere to this specification's Division 16 requirements where conduit crosses building expansion joints.

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.

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.

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.

COMMUNICATION WIRING

The contractor shall adhere to the items listed in the *Wiring* section in *PART 3 – EXECUTION* of the specification.

All cabling shall be installed in a neat and workmanlike manner. Follow manufacturer's installation recommendations for all communication cabling.

Do not install communication wiring in raceway and enclosures containing Class 1 or other Class 2 wiring.

Maximum pulling, tension, and bend radius for cable installation, as specified by the cable manufacturer, shall not be exceeded during installation.

Contractor shall verify the integrity of the entire network following the cable installation. Use appropriate test measures for each particular cable.

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.

All runs of communication wiring shall be unspliced length when that length is commercially available.

All communication wiring shall be labeled to indicate origination and destination data.

Grounding of coaxial cable shall be in accordance with NEC regulations article on

FIBER OPTIC CABLE SYSTEM

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.

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.

All terminations need to be made into a patch panel, designed for such use. Free air terminations with patch panels are prohibited.

INSTALLATION OF SENSORS

Install sensors in accordance with the manufacturer's recommendations.

Mount sensors rigidly and adequately for the environment within which the sensor operates.

Room temperature sensors shall be installed on concealed junction boxes properly supported by the wall framing.

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.

Sensors used in mixing plenums and hot and cold decks shall be of the averaging type.

Low-limit sensors used in mixing plenums shall be installed in a serpentine manner horizontally across the full face of the coil.

All pipe-mounted temperature sensors shall be installed in wells. Install all liquid temperature sensors with heat-conducting fluid in thermal wells.

Install outdoor air temperature sensors on north wall, complete with sun shield at designated location.

Room Instrument Mounting

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.

Instrumentation Installed in Piping Systems

Thermometers and temperature sensing elements installed in liquid systems shall be installed in thermowells.

Gauges in piping systems subject to pulsation shall have snubbers.

Gauges for steam service shall have pigtail fittings with isolation valve.

Duct Smoke Detectors

Duct smoke detectors will be provided by the Electrical Contractor in supply and return air ducts in accordance with Division 16.

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.

Averaging Temperature Sensing Elements

Sensing elements shall be installed in a serpentine pattern.

Averaging sensors shall be installed in a serpentine manner vertically across the duct.

Each bend shall be supported with a capillary clip.

ACTUATORS

Mount and link control damper actuators according to manufacturer's instructions.

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.

Check operation of damper/actuator combination to confirm that actuator modulates damper smoothly throughout stroke to both open and closed positions.

Provide all mounting hardware and linkages for actuator installation.

Electric/Electronic

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.

WARNING LABELS & IDENTIFICATION TAGS

Permanent warning labels shall be affixed to all equipment that can be automatically started by the DDC system.

Labels shall use white lettering (12-point type or larger) on a red background.

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.**

Permanent warning labels shall be affixed to all motor starters and all control panels that are connected to multiple power sources utilizing separate disconnects.

Labels shall use white lettering (12-point type or larger) on a red background.

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.**

Equipment and Device labeling

Labels and tags shall be keyed to the unique identifiers shown on the As-Built drawings.

All Enclosures and DDC Hardware shall be labeled.

All sensors and actuators not in occupied areas shall be tagged.

Airflow measurement arrays shall be tagged to show flow rate range for signal output range, duct size, and pitot tube AFMS flow coefficient.

Duct static pressure taps shall be tagged at the location of the pressure tap.

Tags shall be plastic or metal and shall be mechanically attached directly to each device or attached by a metal chain or wire.

Labels exterior to protective enclosures shall be engraved plastic and mechanically attached to the enclosure or DDC Hardware.

Labels inside protective enclosures may be attached using adhesive, but shall not be hand written.

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.

Identify room sensors relating to blower coils or valves with nameplates.

Manufacturers' nameplates and UL or CSA labels are to be visible and legible after equipment is installed.

Identification of Tubing and Wiring

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.

Permanently label or code each point of field terminal strips to show the instrument or item served.

All pneumatic tubing shall be labeled at each end within 5 cm (2 in.) of termination with a descriptive identifier.

IDENTIFICATION OF HARDWARE & WIRING

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.

All pneumatic tubing shall be labeled at each end within 5 cm (2 in.) of termination with a descriptive identifier.

Permanently label or code each point of field terminal strips to show the instrument or item served.

Identify control panels with minimum 1 cm (1/2 in.) letters on laminated plastic nameplates.

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.

Identify room sensors relating to blower coils or valves with nameplates.

Manufacturers' nameplates and UL or CSA labels are to be visible and legible after equipment is installed.

Identifiers shall match record documents.

PROGRAMMING

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.

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.

Software Programming

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:

Text-based

Must provide actions for all possible situations.

Must be modular and structured.

Must be commented.

Must provide line-by-line programming and compilation wizard to allow for ease of editing.

Graphic-based

Must provide actions for all possible situations.

Must provide programming and compilation wizard to allow for ease of editing.

Must be documented.

Operator Interface

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.

Show terminal equipment information on a “graphic” summary table. Provide dynamic information for each point shown.

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.

Contractor shall provide necessary programming to create all reports referred to in the *Operator Interface Software* section in *PART 2–PRODUCTS* of this specification.

CONTROL SYSTEM CHECKOUT & TESTING

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.

Phase I – Field I/O Calibration and Commissioning

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.

Phase II – System Commissioning

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.

Phase III - Integrated System Program Commissioning

Tests shall include, but not be limited to:

Data communication, both normal and failure modes.
Fully loaded system response time.
Impact of component failures on system performance and system operation.
Time/Date changes.
End of month/end of year operation.
Season changeover.
Global application programs and point sharing.
System backup and reloading.
System status displays.
Diagnostic functions.
Power failure routines.
Battery backup.
Smoke Control, vents, in concert with Fire Alarm System testing.
Testing of all electrical and HVAC systems with other division of work.
Year 2000 compliance test.

Sub Systems shall also be tested and commissioned.

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.

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.

The B.M.S. contractor shall supply all instruments for testing. Instruments shall be turned over to the owner after acceptance testing.

All test instruments shall be submitted for approval prior to their use in commissioning.

Test Instrument Accuracy

Temperature: 1/4°F or 1/2% full scale, whichever is less.
Pressure: High Pressure (psi): 1/2 psi or 1/2% full scale, whichever is less.
Low Pressure: 1/2% of full scale (in. w.c.)
Humidity: 2% rh
Electrical: 1/4% full scale

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.

Additional testing, debugging and fine tuning

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.

CONTROL SYSTEM DEMONSTRATION & ACCEPTANCE

Demonstration

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.

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.

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.

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.

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.

Demonstrate compliance with the *System Performance* section in *PART 1–GENERAL* of this specification.

Demonstrate compliance with sequences of operation through all modes of operation.

Demonstrate complete operation of operator interface.

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.

Acceptance

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.

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.

CLEANING

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.

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.

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.

TRAINING

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.

SEQUENCE OF OPERATION

Refer to Sequence on plans.

END OF SECTION 15950

SECTION 16100 - ELECTRICAL

PART 1 - GENERAL

RELATED DOCUMENTS

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.

SCOPE

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:

- Service Entrance
- Grounding
- Lighting and controls
- Demolition
- Telecommunications
- Exterior Distribution/Branch Circuits
- Interior Distribution/Branch Circuits
- Equipment Connections
- Fire alarm
- Intercom/Sound
- Outdoor Lighting

JOB CONDITIONS

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.

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.

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.

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.

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.

TEMPORARY POWER

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.

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.

CODES, PERMITS AND INSPECTIONS

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:

International building Code 2021

International Fire Code 2021

NFPA 70-2020, National Electrical Code

NFPA 72-2019, National Fire Alarm and Signaling Code

ASHRAE Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings

DRAWINGS AND SPECIFICATIONS

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.

STANDARDS OF MATERIALS AND WORKMANSHIP

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.

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.

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.

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:

Lighting controls.
Dry type transformers.
Panelboards.
Safety switches.
Lighting fixtures.
Emergency battery units.
Fire alarm system.
Intercom/Clock

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.

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.

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.

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:

General contractor with phone number and project manager.
Subcontractor with phone number and project manager.
Supplier of equipment with phone number and person responsible for this project.
Index of each item covered in submittal and model number as proposed in the attached.

Any deviation from contract documents shall be specifically noted on submittal cover index and boldly on specific submittal sheet.

TYPE OF PERMANENT ELECTRICAL SERVICE

Existing 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. Contractor shall include any and all costs associated with the service in his bid price and shall pay these costs to the serving utility company.

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.

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.

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:

Location of stub-outs, dimensioned from permanent building lines.

Location and depth of under-slab and in-slab raceways.

All routing of raceways.

Corrected panelboard and equipment schedules.

Corrected circuit numbers as they appear on panelboard directories.

Corrected motor horsepower and full load amperages.

Number, size, type of insulation, and number of wires in each conduit or multi-conductor cable whether in conduit or exposed.

Location of junction boxes and splices.

Location of access panels.

INTERFACE WITH OTHER CONTRACTS

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.

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.

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.

EQUIPMENT FURNISHED UNDER OTHER SECTIONS

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.

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.

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.

EQUIPMENT CONNECTIONS

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.

GROUNDING

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. Interconnection 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.

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.

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.

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.

GUARANTEE AND SERVICE

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

GENERAL

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.

LOW VOLTAGE SWITCHBOARD

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:

NEMA PB-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.

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.

Construction

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.

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.

The assembly shall be provided with adequate lifting means.

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.

The switchboard shall be suitable for use as service entrance equipment and be labeled in accordance with UL requirements.

The switchboard shall be capable of metering requirements as indicated on the drawings.

Bus

All bus bars shall be silver-plated copper. Bus sizing shall be based on NEMA standard temperature rise criteria of 65 degrees C over a 40 degrees C ambient (outside the enclosure).

Provide a full capacity neutral bus.

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.

All hardware used on conductors shall be high-tensile strength and zinc-plated. All bus joints shall be provided with conical spring-type washers.

Wiring/Terminations

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.

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.

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.

Circuit Breakers - Where indicated, provide circuit breakers UL listed for application at 100% of their continuous ampere rating in their intended enclosure.

Nameplates

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.

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.

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.

PANELBOARDS

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:

NEMA Standard PB-1

UL Standards: Cabinets and Boxes -UL50; Panelboards - UL 67

National Electric Code

Panelboards shall be labeled as suitable for use as service equipment in accordance with Article 408 of the National Electrical Code.

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.

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.

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.

All computer isolation panels shall have 200% neutral bus.

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.

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.

Short circuit rating shall be as indicated on panel schedule.

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.

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.

All panels shall be fully rated. No series rating of breakers is acceptable.

Provide subfeed lugs, feed through lugs, handle blocking devices, pad locking devices, shunt trips and ground bus bars as shown on schedules.

Panelboards shall be manufactured by Siemens, General Electric or Square D or prior approved.

NAMEPLATES

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"

DIRECTORIES

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.

DISCONNECT SWITCHES

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.

FUSES

Furnish fuses for fusible equipment. Supply one (1) set of 3-spare 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.

RACEWAY AND FITTINGS

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.

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.

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.

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.

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.

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.

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.

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.

PVC 80 shall be used only where specifically 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.

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.

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:

[TABLE ON NEXT PAGE]

MAXIMUM SUPPORT

| <u>TRADE SIZE</u> | <u>LOCATION OF RUNS</u> | <u>SPACING</u> |
|-------------------|-------------------------|----------------|
| 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 |

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.

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.

Expansion Joints

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.

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.

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.

Conductors

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:

Grounding

120/208 volt Three Phase (wye)

Phase Conductors:

Neutral:

Bare or Green

A-Black, B-Red, C-Blue

White

277/480 volt Three Phase (wye)

Phase Conductors:

Neutral:

A-Brown, B-Orange, C-Yellow

Natural Grey

All circuits are to be run with a neutral conductor: No shared neutral conductors are allowed.

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.

JUNCTION AND PULL BOXES

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.

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).

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.

OUTLETS

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.

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.

WIRING DEVICES

Colors: Wiring device and plate colors shall be selected by Architect.

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.

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.

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.

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.

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.

LIGHTING FIXTURES

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.

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.

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.

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.

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.

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%.

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.

TELEPHONE SYSTEM

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.

PRODUCT DELIVERY, STORAGE AND HANDLING

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.

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

EXCAVATION, TRENCHING AND BACKFILLING

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.

PAINTING

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.

TESTING AND BALANCING

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.

CLEANING UP

The Contractor shall remove all oil, grease, or other stains resulting from his work performed in the building or the exterior thereof.

WARRANTY AND MAINTENANCE

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 16100

SECTION 16110 - LIGHTING CONTROLS

PART 1 - GENERAL

INTRODUCTION

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.

SYSTEM DESCRIPTION

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.

QUALITY ASSURANCE

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.

Comply with NEC, NEMA, and FCC Emission requirements for Class A applications.

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.

SUBMITTALS

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.

MANUFACTURERS

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

OCCUPANCY SENSORS AND POWER PACKS

Occupancy Sensors

All products listed are Watt Stopper product numbers and will integrate fully with the Lighting Control system listed in the project specifications.

Ceiling sensors

DT-200, DT-300.

Wall sensors

DW-100:

Dual technology sensors

Use passive infrared and ultrasonic technologies for occupancy detection. Products that react to noise or ambient sound shall may be considered.

Ultrasonic sensors

Utilize Advanced Signal Processing to adjust the detection threshold dynamically to compensate for constantly changing levels of activity and airflow throughout controlled space.

Have an ultrasonic operating frequency that is crystal controlled at 25 kHz within \square 0.005% tolerance, 32 kHz within \square 0.002% tolerance, or 40 kHz \square 0.002% tolerance to assure reliable performance and eliminate sensor cross-talk. Sensors using multiple frequencies are not acceptable.

All sensors shall be capable of operating normally with electronic ballasts, PL lamp systems and rated motor loads.

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.

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).

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.

Circuit Control Hardware – (POWER PACKS)

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.

Relay Contacts shall have ratings of:

13A - 120 VAC Tungsten

20A - 120 VAC Ballast

20A - 277 VAC Ballast
20A – 347 VAC Ballast

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:

Minimum acceptable wire gauge from the circuit control hardware relays shall be #14 AWG.

EXTERIOR PHOTOCELLS

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

SUPPORT SERVICES

Service Description

System Startup

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.

Training

Manufacturer shall provide factory authorized technician to train owner personnel in the operation, programming and maintenance of the lighting control system.

Documentation

Manufacturer shall provide system documentation including:

System one-line showing number and type of switches and sensors, dataline.
Typical wiring diagrams for each component.

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.

Programming

Manufacturer shall provide system programming including:

Wiring documentation.

Switch operation.

Operating schedules.

END OF SECTION 16110

SECTION 16300 - LOW VOLTAGE DRY TRANSFORMERS

PART 1 - GENERAL

GENERAL

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.

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.

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.

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.

Sound Rating: In accordance with ANSI-C89 and NEMA standard sound ratings.

Impedance: 75 KVA and smaller; 3.0% impedance, minimum. Larger than 75 KVA; 4.5% impedance, minimum.

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.

Larger than 15 KVA: Floor mount.

For non linear loads use a minimum of K-13 or ASF shown on drawing.

Transformers are to have copper windings and be NEMA-TP1 rated.

Acceptable: General Electric; Siemens; Westinghouse; Sorgel; Schneider.

END OF SECTION 16300

SECTION 16720 - FIRE DETECTION AND ALARM SYSTEMS

PART 1 - GENERAL

SUMMARY

Includes But Not Limited To:

Furnish and install a fire alarm and detection system as described in Contract Documents.

Furnish and install raceway, conductors, boxes, and miscellaneous items necessary for complete system.

Related Sections: Division 16 - Quality and installation standards for wiring, raceway, conduit, and boxes.

SYSTEM DESCRIPTION

An automatic fire alarm system consisting of control panel, power supplies, alarm initiating devices, and notification appliances.

Class B (Style B) initiating device circuits and Class B (Style W) notification appliance circuits including end-of-line devices.

Performance Requirements

Operation of manual station or automatic activation of any smoke detector, shall:

Cause system notification appliances to operate.

Indicate device in alarm at control pane LCD display.

Indicate device in alarm on remote annunciator LCD display

Initiate off-site alarm notification system.

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.

Alarm may be silenced by switch in control panel.

Ring Back Feature

When silenced, this shall not prevent the resounding of subsequent alarms if another zone should alarm.

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.

Green pilot LED shall normally be on indicating that system is receiving normal power. Failure of normal power shall cause this LED to extinguish.

Amber trouble LED and trouble alarm, operating together, shall signal trouble condition.

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.

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.

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.

SUBMITTALS

Shop Drawings

Prepared by authorized factory representative and including:

Single line diagram of actual system. Typical riser diagrams are not acceptable.

Complete wiring diagrams.

Manufacturer's original catalog data and descriptive information on each piece of equipment to be used.

All documentation and submittals required by the Authority Having Jurisdiction are to be submitted within 30 day of the contract award.

Approval of the Authority Having Jurisdiction and permitting are required before work on the project is to commence.

Quality Assurance/Control

Certificate of completion, from Manufacturer's Representative, in accordance with NFPA 72 requirements.

Closeout

Operations and Maintenance Manual Data

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.

Include copy of approved shop drawings.

QUALITY ASSURANCE

Regulatory Requirements

System shall meet approval of Authority Having Jurisdiction (AHJ). NEC and local ordinances and regulations shall govern unless more stringent requirements are specified.

Equipment, devices, and cable shall be UL or Factory Mutual listed for use in fire alarm

systems.

OWNER'S INSTRUCTIONS

Instruct Owner's representative in proper operation and maintenance procedures.

PART 2 - PRODUCTS

COMPONENTS

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.

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.

Operator Control

Acknowledge Switch

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.

Depression of the Acknowledge switch shall also silence all remote annunciator piezo sounders.

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.

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.

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.

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 personal.

System Capacity and General Operation

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.

It shall include Class B (NFPA Style Y) or Class A (NFPA Style Z) programmable Notification Appliance Circuits.

The Notification Appliance Circuits shall be programmable to Synchronize with System Sensor, and Notification Appliances.

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.

The system shall be programmable, configurable, and expandable in the field without the need for special tools, PROM programmers or PC based programmers.

The system shall allow the programming of any input to activate any output or group of outputs

The FACP or each network node shall provide the following features:

Drift compensation to extend detector accuracy over life. Drift compensation shall also include a smoothing feature, allowing transient noise signals to be filtered out.

Detector sensitivity test, meeting requirements of NFPA 72, Chapter 7.

Maintenance alert, with two levels (maintenance alert/maintenance urgent), to warn of excessive smoke detector dirt or dust accumulation.

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.

The ability to display or print system reports.

Alarm verification, with counters and a trouble indication to alert maintenance personnel.

PAS presignal, meeting NFPA 72 3-8.3 requirements.

Devices shall meet NFPA 72 Chapter 1 requirements for activation of notification circuits within 10 seconds of initiating device activation.

Periodic detector test, conducted automatically by the software.

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.

Cross zoning with the capability of counting: two detectors in alarm, two software zones in alarm, or one smoke detector and one thermal detector.

Walk test, with a check for two detectors set to same address.

Day/night automatic adjustment of detector sensitivity.

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.

Network Communication

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.

Central Microprocessor

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.

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.

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.

A special program check function shall be provided to detect common operator errors.

An auto-program (self-learn) function shall be provided to quickly install initial functions and make the system operational.

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.

System Display

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.

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.

The display shall annunciate status information and custom alphanumeric labels for all intelligent detectors, addressable modules, internal panel circuits, and software zones.

The display shall also provide Light-Emitting Diodes.

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.

The display shall have QWERTY type keypad.

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.

The system shall support the display of battery charging current and voltage on the 80-character LCD display.

Voice Command Center (VCC)

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.

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.

The audio portion of the system shall sound the proper audio signal (consisting of tone, voice, or tone and voice) to the appropriate zones.

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.

Audio amplifiers and tone generating equipment shall be electrically supervised for normal and abnormal conditions.

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.

Speaker circuits shall be either 25 VRMS or 70VRMS. Speaker circuits shall have 20% space capacity for future expansion or increased power output requirements.

The emergency voice alarm communication system shall incorporate a Two-way emergency telephone communication system.

Two-way emergency telephone communication circuits shall be supervised for open and short circuit conditions.

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.

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.

Alarm Initiating Devices:

Ceiling Mounted Smoke Detectors

Combination of photoelectric and thermal type.

Photoelectric type.

Listed under UL Standard 268.

Provide visual indication of alarm on unit when normally pulsed supervisory LED glows continuously.

Duct Mounted Smoke Detectors

Photoelectric type.

Listed under UL Standard 268.

Manual Fire Alarm Boxes

Double-action requiring two actions to initiate alarm.

Box shall mechanically latch when actuated and require key to reset. Key shall match control panel door lock.

Notification Appliances

Combination Horn/Strobe

Wall mounted flush or semi-flush.

Non-coded audible output of 90 dB minimum at 10 feet.

Integrally mounted flashing light unit with block letters 'FIRE'. Minimum light intensity of 75 candela and flash rate between one and three Hertz.

Listed under UL Standards 464 and 1971.

Strobe Only

Wall mounted flush or semi-flush.

Integrally mounted flashing light unit with block letters 'FIRE'. Minimum light intensity of 75 candela and flash rate between one and three Hertz.

Listed under UL Standard 1971.

Speakers

All speakers shall operate on 25 VRMS or with field selectable output taps from 0.5 to 2.0 Watts.

Speakers in corridors and public spaces shall produce a nominal sound output of 84 dBA at 10 feet (3m).

Frequency response shall be a minimum of 400 HZ to 4000 HZ.

The back of each speaker shall be sealed to protect the speaker cone from damage and dust.

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.

ACCEPTABLE MANUFACTURERS

New fire alarm panel shall be compatible with existing fire alarm system. New panel shall be an addressable type that can be integrated with the existing zone type system to have one fully functional campus wide fire alarm system.

Cerebrus Pyrotronics, Cedar Knolls, NJ (973) 593-2600

Edwards Systems Technology, Cheshire, CT (203) 699-9300

Faraday Inc, Tecumseh, MI (517) 423-2111

Honeywell, Minneapolis, MN (800) 328-5111

Notifier, Northford, CT (800) 454-9779

PART 3 - EXECUTION

INSTALLATION

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'.

Mounting Heights

Unless otherwise indicated, mount center of outlets or boxes at following heights above finish floor:

Manual Fire Alarm Boxes (Pull Stations) - 48 inches

Fire Alarm Horns/Strobes - 80 inches

Conductors

Install conductors in conduit.

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'.

Install conductors and make connections to elevator control panel and duct smoke detectors.

Loop wires through each device on zone for proper supervision. Tee-taps not

permitted.

Minimum conductor size shall be 14 AWG unless otherwise specified.

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.

FIELD QUALITY CONTROL

Manufacturer's Field Service

Provide factory trained representative to perform complete system testing in presence of Owner's representative and local fire department personnel upon completion of installation.

Test each initiating and annunciating device for proper operation, except fixed temperature heat detectors.

Test operation of trouble annunciation on each circuit.

Perform complete testing of control panel functions.

PROTECTION

Provide dust protection for installed smoke detectors until finish work is completed and building is ready for occupancy.

Protect conductors from cuts, abrasion and other damage during construction.

END OF SECTION 16720

SECTION 16950 - COMMUNICATIONS

PART 1 - GENERAL

RELATED DOCUMENTS

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.

SCOPE

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:

Data
Telephone

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.

Work shall be free from faults and defects in workmanship. Materials and equipment incorporated into the work shall be new, unless noted otherwise.

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.

CONTRACTOR QUALIFICATIONS

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.

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.

The head Installer assigned for the project shall be a BICSI registered Level II installer.

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:

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.

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.

The RCDD shall periodically visit the site and inspect the work in progress. RCDD site 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.

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.

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.

The RCDD shall be present for and participate in not less than four hours of user training.

CONTRACTOR QUALIFICATIONS – CONDUIT INSTALLATION:

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.

BID REQUIREMENTS

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.

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.

RCDD name, BICSI certification number, and qualifications.

Location of office from which installation and warranty work will be performed.

ADDITIONAL MATERIAL REQUIREMENTS

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:

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.

Four installations of data surge protection (as specified on drawings), including grounding conductor and enclosure.

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.

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.*

RELATED REQUIREMENTS

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.

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.

EXAMINATION OF SITES AND TOTAL SYSTEM RESPONSIBILITY

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.

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.

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.

JOB CONDITIONS

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.

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.

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.

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.

CODES, PERMITS AND INSPECTIONS

Minimally, the following standards must be met when applicable to the work performed:

International Standards Organization/International Electrotechnical Commission (ISO/IEC) DIS 11801

Underwriters Laboratories (UL) Cable Certification and Follow up Program.

ANSI/TIA/EIA-568-B.1 -- Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements

ANSI/TIA/EIA-568-B.2-1 -- Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted Pair Cabling Components

ANSI/TIA/EIA-568-B.3 -- Optical Fiber Cabling Components Standard

ANSI/TIA/EIA-569-A -- Commercial Building Standard for Telecommunications Pathways and Spaces

ANSI/TIA/EIA-606(A) -- The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings

ANSI/TIA/EIA-607(A) -- Commercial Building Grounding and Bonding Requirements for Telecommunications

ANSI/TIA/EIA-526-7 -- Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant

ANSI/TIA/EIA-526-14A -- Measurement of Optical Power Loss of Installed Multimode Fiber Cable Plant

ANSI/TIA/EIA-758(A) -- Customer-Owned Outside Plant Telecommunications Cabling Standard

AHJ -- Local Authority Having Jurisdiction (AHJ)

NEC -- National Electrical code

NFPA -- National Fire Protection Association

NESC -- National Electrical Safety Code

BICSI -- BICSI Telecommunications Distribution Methods Manual (TDMM)

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.

JOB-SITE CONDITIONS:

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.

The Contractor shall be responsible for ensuring that his employees and any subcontractors:

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.

Refrain from the use of vulgarities while on School District property.

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.

Refrain from contact with students or staff. Communications with staff shall be limited to that related to the work.

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.

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.

PRE-INSTALLATION WALK-THRU

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.

PRE-CONSTRUCTION CONFERENCE

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.

DRAWINGS AND SPECIFICATIONS:

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.

STANDARDS OF MATERIALS AND WORKMANSHIP:

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.

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.

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.

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.

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.

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:

General contractor with phone number and project manager.

Subcontractor with phone number and project manager.

Supplier of equipment with phone number and person responsible for this project.

Index of each item covered in submittal and model number as proposed in the attached.

Any deviation from contract documents shall be specifically noted on submittal cover index and boldly on specific submittal sheet.

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.

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.

INTERFACE WITH OTHER CONTRACTS

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.

GROUNDING

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.

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.

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.

GUARANTEE AND SERVICE

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

GENERAL

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.

CABLES

Data/Communication Cable: Cable shall be Category 5e unshielded twisted pair. The vendor shall determine if plenum or riser rated cable is required for the specific installation.

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.

Fiber: Fiber shall be 6 strand count multi-mode fiber optic cable.

Cabling will have a 15 year *manufacturers* warranty on all parts and labor.

All copper cable terminations shall comply with, and be tested to TIA/EIA 568B and TSB-67 standards for Category 5e installations.

All test results shall be compiled and given to the Owner in electronic format.

Cables to be provided by the Contractor:

One 6' patch cord with terminations per data connection point.

One 6' telephone cable with terminations per telephone connection point.

RCA outlet connection cabling as shown on the plans.

Cat-5e cabling and labeled terminations from the Data Equipment Rack to all data connection points.

Cat-5e cabling and labeled terminations from the Telephone Equipment Rack to all Telephone connection points.

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.

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.

CABLE ROUTING

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 5e 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.

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 5e 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 5e 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.

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.

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.

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.

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.

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.

STRUCTURED CABLING SYSTEM

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).

SYSTEM DESCRIPTION

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 5e installations. Station cables shall terminate on wall plates equipped as designated by Baldwin County Board of Education (BCBE) personnel.

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:

Voice Outlet - AMP, Ortronics, or Hitachi 8-pin modular, category 3, unkeyed, black, pinned to T568B Standard.

Data Outlet - AMP, Ortronics, or Hitachi 8-pin modular, category 5e, unkeyed, orange, pinned to T568B Standard.

Optical Fiber Connectors - MTRJ adapter.

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.

Station Cable: Category 5e 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.

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.

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.

Multimode Fiber Specifications: All fiber optic cables within the premises will use multimode, graded index, fibers with 62.5 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.

Fan-out Kits: All loose tube cables will be provided with fan-out kits at each termination point.

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.

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.

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.

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.

Designation strips for each jack shall be provided on the patch panel. All cables shall be terminated in numerical sequence.

Category 5e Patch Cords: Provide Category 5e 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.

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.

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.

Fiber Patch Cords: The fiber patch cords shall consist of a buffered, graded index fiber with 62.5 micron core and a 125 micron cladding for multimode 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.

Multimode Fiber Optic Connector: Provide a field installable multimode 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.

CABLE LADDER

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.

A CSD Firsto firestop system is to be provided and installed where fire barriers are penetrated by cable ladders.

IDENTIFICATION:

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.

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.

Label each main cable at each end based on source and destination room numbers using Engineer approved permanent labeling system.

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.

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.

Label each existing communications outlet to match new labeling scheme as shown on the plans.

Label each communications outlet, horizontal wiring terminal block, backbone wiring terminal block, communications panel, rack, enclosure, and other devices as indicated on the drawings.

CABLE TESTING

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.

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.

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.

Tests shall be performed in strict accordance with the test instrument manufacturer's printed instructions.

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.

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. 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.

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.

Quantity: One (1).

Format: CD/DVD disk with printed label indicating the following:

- Project Name
- Contractor's Name
- Owner's Name
- Owner's Project Number or Purchase Order Number

CD/DVD Contents

RCDD Certification (PDF format): Written Certification of Contractor's RCDD, digitally signed, stating that all fiber optic, Category 5e, and multi-pair telephone cables have been tested in compliance with the contract documents and have met or exceeded the requirements stated therein.

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

Fiber optic cable shall be tested with an OTDR tester.

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.

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.

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.

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.

Documentation

Test documentation for fiber optic cabling shall include the following:

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.

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.

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.

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 5e UTP Cable Testing

Category 5E cable shall be tested with a Level II tester.

Notify the Engineer in writing not less than five days prior to commencing Category 5E

UTP cable testing

The Engineer may elect to be present for and witness cable testing.

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 5e UTP cable, test each cable in accordance with TIA/EIA test specifications. Test each cable from both ends with a Category 5e tester, Fluke DSP 4000 series or approved equal, to verify compliance with TIA/EIA specifications for Category 5e 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.

Documentation

Test documentation for Category 5e cabling shall include the following:

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.

An introductory discussion documenting test instruments used, qualifications of operators, test conditions, setup parameters, and any other pertinent information.

One copy of a full page hardcopy printout for each cable test using the tester manufacturer's standard "Cable Certification Report - CAT5e 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.

Insert all Category 5e cable test documentation in the Cable Test Manual.

Category 5e 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.

PRODUCT DELIVERY, STORAGE AND HANDLING:

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

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

CLEANING UP

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.

SUBSTANTIAL COMPLETION

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.

CORRECTIVE ACTION

The contractor shall correct any and all deficiencies listed for completion or correction within a reasonable amount of time after deficiency is noted.

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.

OWNER PERSONNEL TRAINING

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.

The Engineer shall be notified prior to training and may participate in training at their discretion.

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 trouble-shooting and operation of the structured cabling system and data hub equipment.

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.

FINAL COMPLETION

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.

WARRANTY AND MAINTENANCE

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.

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.

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.

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.

The services of a qualified technician shall be available to make necessary warranty repairs in a timely manner during the warranty period.

SUPPORT SERVICES

Service Description:

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.

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.

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.

Documentation

Manufacturer shall provide system documentation including:

System one-line showing all patch panels, racks, number and type of devices and the connections between systems and to the service entrance.
Drawings for each system showing hardware configuration and numbering.
Typical wiring diagrams for each component.

The manufacturer will certify that the products will meet the product specifications.

END OF SECTION 16950