Project Manual Alabama A&M University Elmore Health Science Restroom Renovation



Architect's Project Number 21224

Alabama DCM Number Unassigned

March 11, 2022



Nola | VanPeursem Architects, PC • 301 Jefferson Street • Huntsville, AL 35801

SECTION 00 01 01

TITLE PAGE

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PROJECT MANUAL FOR:

PROJECT:	Elmore Health Science Restroom Renovation
RELEASE DATE:	March 11, 2022
ARCHITECT'S PROJECT NUMBER:	21224
ALABAMA DCM NUMBER:	Unassigned
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BID DOCUMENTS AND FORMS

PART 1 GENERAL

1.01 DOCUMENTS

- A. Advertisement for Bids DCM Form C-1, dated August 2021.
- B. Instructions to Bidders DCM Form C-2, dated August 2021.
- C. Supplement A Instructions to Bidders.
- D. Proposal Form DCM Form C-3, dated August 2021.
- E. Accounting of Sales Tax DCM Form C-3A-Sales Tax, dated August 2021.
- F. Bid Bond DCM Form C-4, dated August 2021.

1.02 DOCUMENT AVAILABILITY

- A. A copy of the documents and forms noted above is attached hereto, as provided by the Alabama Department of Finance, Real Property Management.
- B. Additional copies may be obtained from the office of the Alabama Department of Finance, Real Property Management, 770 Washington Avenue, Suite 470, Montgomery, Alabama 36104, phone (334) 242-4082 or www.realproperty.alabama.gov

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SAMPLE ADVERTISEMENT FOR BIDS

Sea	led proposals wil	ll be received by		
			(Owner's legal	title)
at the office	of 10	(Name and address of	f Owner's authorized representative)	
until	CST	,	,,	for
(Hou (Description o	urs) of the work to be ir	(Month), nserted here):	(Day),	(Year)
at which tim	e and place they	will be publicly opened	and read.	
A c	ashier's check or	bid bond payable to		
in an amour	nt not less than f	five (5) percent of the	(Owner's legal amount of the hid but in no	title) event more than \$10,000
must accomp the bid docu	pany the bidder's iments will be rea	s proposal. Performanc quired at the signing of t	e and Payment Bonds and evi he Contract.	dence of insurance required in
Dra	wings and specif	fications may be examin	ed at the office of	
		(Owner's re	presentative and address)	
and	nlan rooms: i e	F W Dodge Builders	Exchange Construction Marke	t Data etc.)
	plan rooms, i.e.,	F. W. Douge, Builders		
which will b bid, upon re and sets for above, less o	be refunded in fu turn of documer subcontractors cost of printing,	Il on the firsts nts in good condition w and dealers, may be reproduction, handling,	the Architect (Engineer) upon ets issued to each general conv vithin ten days of bid date. Of obtained with the same dep and distribution.	in deposit of \$ per set tract bidder submitting a bonafide Other sets for general contractors osit, which will be refunded as
(If applicab) criteria estat criteria are a	le) Only general blished by the O vailable for revie	contractors who have be wner will be eligible to w at the office of	een approved to bid pursuant to bid for the Project. Written	o prequalification procedures and prequalification procedures and
			(Owner's or Architect's/Engineer's	representative and address)
Bid bidders bidd must be licc evidence of bidder shall sealed envel proposals ar be promoted	Is must be submiding in amounts ensed under the license before to show such evi- lope in which nd to waive tech	itted on proposal forms exceeding that establi e provisions of Title bidding or bid will not dence by clearly displa the proposal is delive mical errors if, in the O	furnished by the Architect (If ashed by the State Licensing 34, Chapter 8, Code of Al t be received or considered by ying his or her current licens red. The Owner reserves owner's judgement, the best int	Engineer) or copies thereof. All Board for General Contractors abama, 1975, and must show by the Architect (Engineer); the e number on the outside of the the right to reject any or all terests of the Owner will thereby
			(Award	ling Authority/Owner)

(Local Awarding Authority/Local Owner)

(Architect/Engineer)

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

INSTRUCTIONS TO BIDDERS

CONTENTS

- 1. Bid Documents
- 2. <u>General Contractor's</u> <u>State Licensing Requirements</u>
- 3. <u>Qualifications of Bidders</u> and Prequalification Procedures
- 4. Preference to Resident Contractors
- 5. Examination of Bid Documents and the Site of the Work
- 6. Explanations and Interpretations
- 7. <u>Substitutions</u>
- 8. Preparation and Delivery of Bids

- 9. Withdrawal or Revision of Bids
- 10. Opening of Bids
- 11. Incomplete and Irregular Bids
- 12. Bid Errors
- 13. Disqualification of Bidders
- 14. Consideration of Bids
- 15. <u>Determination of Low Bidder by</u> Use of Alternates
- 16. Unit Prices
- 17. Award of Contract

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.

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

8. PREPARATION and DELIVERY of BIDS:

a. DCM Form C-3: Proposal Form:

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

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

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

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

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

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

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

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

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

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

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

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

c. Bid Guaranty

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

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

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

d. Delivery of Bids:

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

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

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

9. WITHDRAWAL or REVISION of BIDS:

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

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

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

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

10. OPENING of BIDS:

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

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

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

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

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

13. DISQUALIFICATION of BIDDERS:

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

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

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

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

14. CONSIDERATION of BIDS:

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

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

15. DETERMINATION of LOW BIDDER by USE of ALTERNATES:

a. The Awarding Authority may request alternate bid prices (alternates) to facilitate either reducing the base bid to an amount within the funds available for the project or adding items to the base bid within the funds available for the project. Alternates, if any, are listed in the

Proposal Form in the order in which they shall cumulatively deduct from or add to the base bid for determining the lowest bidder.

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

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

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

16. UNIT PRICES:

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

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

17. AWARD of CONTRACT:

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

b. A bidder to whom award is made will be notified by telegram, confirmed facsimile, or letter to the address shown on the Proposal Form at the earliest possible date. Unless other

time frames are stipulated in Supplemental Instructions to Bidders, the maximum time frames allowed for each step of the process between the opening of bids and the issuance of an order to proceed with the work shall be as follows:

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

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

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

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

END of INSTRUCTIONS TO BIDDERS

SUPPLEMENT A TO THE INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.01 PURPOSE

- A. The changes, deletions and omissions to DCM Form C-2, Instructions to Bidders.
 - 1. AWARD OF CONTRACT (ITEM NO. 17), modify paragraph b., (3):
 - 3. Awarding Authority's approval of the contractor's bonds and evidence of insurance and completion of contract execution 40 calendar days after the contractor presents complete and acceptable documents to the Architect.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

DCM Form C-3 (must be submitted with DCM Form C-3A) August 2021

PROPOSAL FORM

То:	Date:
(Awarding Authority)	
In compliance with the Advertisement for Bids and	subject to all the conditions thereof, the undersigned
(Legal Nar	ne of Bidder)
hereby proposes to furnish all labor and materials an	d perform all work required for the construction of
WORK	
in accordance with Drawings and Specifications, da	ted , prepared by
	, Architect/Engineer.
The Bidder, which is organized and existing under the	he laws of the State of ,
having its principal offices in the City of	
is: □a Corporation □a Partnership □an In	ndividual (other)
BIDDER'S REPRESENTATION: The Bidder of having become fully informed regarding all pertine and Specifications (including all Addenda received)	leclares that it has examined the site of the Work, nt conditions, and that it has examined the Drawings ed) 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 A	ddenda Nos through inclusively.
BASE BID: For construction complete as shown an	d specified, the sum of
	Dollars (\$)
ALTERNATES: If alternates as set forth in the Bia are to be made to the Base Bid:	d Documents are accepted, the following adjustments
For Alternate No. 1 () (add) (deduct) (deduct)
For Alternate No. 2 () (add) (deduct) (deduct)
For Alternate No. 3 () (add) (deduct) (deduct)
For Alternate No. 4 () (add) (deduct) \$
For Alternate No. 5 () (add) (deduct) (deduct)
For Alternate No. 6 () (add) (deduct) (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.)

O 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 Lir

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.

ESTIMATED SALES TAX AMOUNT

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

То:		Date:	
	(Awarding Authority)		
NAME OF PROJECT			

SALES TAX ACCOUNTING

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

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

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	<u> </u>
ATTEST:		PRINCIPAL:
		By
		Name and Title SURETY:
ATTEST:		
		By

Name and Title

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

Project No. 21224

00 22 00 - 1 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

SECTION 00 22 00

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.01 SUPPLEMENTS

A. The following instructions are in addition to Alabama Division of Construction Management Instructions to Bidders - DCM Form C-2, dated August 2021, and the Advertisement for Bids - DCM Form C-1, dated August 2021.

1.02 TIME

A. Perform the Work within the time stated in Section 01 10 00 - Summary. The bidder, in submitting an offer, accepts the contract time period stated for performing the Work.

1.03 INSTRUCTIONS

A. All sealed bids will be received by 2:00 p.m. CDT on

, 2022 at which time each bidder must submit a sealed envelope properly titled containing the Proposal form, the Bid Bond, and Accounting of Sales Tax - DCM Form C-3A form, and Affidavit A. Upon receipt of these documents the bids will be publicly opened and read aloud. Supplement A – List of Subcontractors (section 00 43 21) and Affidavit C are to be hand delivered or emailed to the Architect within 24 hours after receipt of bids. No changes to the base bid will be allowed after 2:00 p.m.

- B. Bids will be opened at the Alabama A&M University, Department of Purchasing Room 305 Patton Hall, 4900 Meridian Street, Normal, Alabama 35762.
- C. Any parties other than General Contractors may obtain contract documents by depositing \$100.00 to Nola | VanPeursem Architects, PC for each set obtained. On return of such documents in good condition within 10 days after the bid opening, the cost of reproduction and postage and mailing will be deducted from the deposit and the balance will be refunded. No refund will be made if plans are not returned in good condition.
- D. General Contractors who submit a bona fide bid will be refunded in full on the first two
 (2) sets issued, upon return of documents in good condition within ten days of bid date. Additional sets may be obtained under the conditions stated in the above Item C.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 00 22 00A

APPENDIX A

OWNER'S SUPPLEMENTARY INSTRUCTIONS TO BIDDERS - DBE/MINORITY

CONSTRUCTION CONTRACTS GOAL FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION

Alabama A & M University is committed to providing equal opportunities for participation in all aspects of the Alabama A & M University construction program. Alabama A & M University prohibits discrimination against any person or business in the pursuit of these opportunities on the basis of race, color, gender, religion, handicap, or national origin, and will make every effort to conduct its contracting and purchasing program so as to prevent any discrimination. Alabama A &M University actively seeks to identify qualified minority, handicapped, and women-owned business enterprises so as to widen opportunities for participation as providers of goods and services, increases competition and ensure the proper and diligent use of public funds.

Alabama A & M University has adopted a goal for participation by disadvantaged business enterprises in construction projects based on the availability of DBE/MINORITY firms for the type of construction trade on that project and the percent of total contract value. The President and his staff shall establish appropriate guidelines and procedures.

OBJECTIVES/STATEMENTS

A. Definitions

- 1.) <u>Bidder/Participa</u>nt- Any person, firm, partnership, corporation, association, or joint venture seeking to be awarded a public contract or subcontract.
- 2.) <u>Contract- A mutual binding legal document which defines a business relationship</u> or any modification at the level of performance which obligates the seller to furnish supplies, equipment, materials, services, or knowledge in performing construction.
- 3.) <u>C</u>ontractors- Any person, firm, partnership, corporation, association, or joint venture awarded a construction contract with Alabama A & M University or has contracted with the Owner to perform construction work or repair.
- 4.) <u>Discrimination-</u> To distinguish, differentiate, separate, or segregate solely on the basis of age, race, religion, color, sex, national origin, handicap, or veteran's status.
- 5.) <u>Equipment- Includes materials, supplies, commodities, apparatus.</u>
- 6.) <u>G</u>oal- An objective, expressed numerically to evaluate the type and amount of public contract awards and performance of disadvantage-owned business enterprises.
- 7.) <u>Good Faith Effort</u>- An activity performed by Bidders to assure the participation of DBE/MINORITY contracts covered under this plan.
- 8.) <u>Joint Venture- A legal merger of two or more separately owned businesses/firms for</u>

the purpose of submitting a single bid, to carry out a single business enterprise for profit, for which purpose they combine their property, capital, efforts, skills, or knowledge.

- 9.) <u>Disadvantaged Business Enterprises (DBE/MINORITY)</u>-A business enterprise owned and controlled at a minimum of 51% by one or more members of a group defined as a minority or women. A business certified as a DBE/MINORITY will show evidence of ownership and management interests and the daily business operations are real and continuing not created solely to meet the DBE/MINORITY requirements. Each firm will be certified by the Transportation Office on Alabama A&M University.
- 10.) <u>Owner</u>-Alabama A & M University
- 11.) <u>Subcontractor</u>- A firm under contract with the prime contractor for supplying materials or labor and materials and/or installation. The subcontractor may or may not provide materials in his subcontract. Work subcontracted in an emergency and which could not have been anticipated is excluded as a part of this program.
- 12.) <u>Socially and economically disadvantaged individual</u>- means the same as defined in 15 U.S.C 637. "Socially disadvantaged individuals are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as a member of a group without regard to their individual qualities". "Economically disadvantaged individuals are those socially disadvantaged individuals whose ability to compete in the free enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business are who are not socially disadvantaged".
- 13.) Verifiable Goal
 - a. For purpose of separate prime contract system, that the awarding authority has adopted written guidelines specifying the actions that will be taken to ensure a good faith effort in the recruitment and selection of DBE/MINORITY s for participation in contracts awarded;
 - b. For purpose of separate prime contract system, that the awarding authority had adopted written guidelines specifying the actions that the prime Contractor must take to ensure a good faith effort in the recruitment and selection of DBE/MINORITY s for participation in contract awarded; and
 - c. The required actions must be documented in writing by the prime contractors to the Owner.

B. <u>Owner's Duties</u>

- 1. Identification/Certification of Disadvantaged Business Enterprises (DBE/MINORITY).
 - a. The University shall affirmatively seek out and gain knowledge of minority and women owned business enterprises in the construction trades.
 - b. The University shall assist in certifying the eligibility of DBE/MINORITYs and joint venture involving DBE/MINORITY firms.
 - c. The University will maintain a list of firms certified as DBE/MINORITY.
 - d. The University will attend the scheduled pre-bid conference.
 - e. At least 7 days prior to the scheduled day of bid opening, notify DBE/MINORITYs that have requested notices from the University, of work being bid or the potential contracting opportunities listed in the proposal. The notification shall include the following:
 - 1. A description of the work for which the bid is being solicited.
 - 2. The date, time, and location where bids are to be submitted.
 - 3. The name of the individual within the owner's organization who will be available to answer questions about the project.

Alabama A&M University Elmore Health Science Restroom Renovation Project No. 21224

00 22 00A-3 APPENDIX A

- 4. Where bid documents may be reviewed.
- 5. Any special requirements that may exist.
- f. Utilize other media; as appropriate, likely to inform potential DBE/MINORITYs of the bid being sought.
- g. Maintain documentation of any contracts, correspondence, or conversation with DBE/MINORITYs made in an attempt to meet the goals.
- h. Evaluate documentation to determine food faith effort has been achieved for DBE/MINORITY utilization prior to recommendation of award.
- i. Review prime contractors' pay applications for compliance with DBE/MINORITY utilization commitments prior to payment.

C. <u>DBE/MINORITY SUBCONTRACT GOALS</u>:

The goals for participation by DBE/MINORITY firms as subcontractors on this project is set for each project based on percentage of each construction trade in project and availability of DBE/MINORITY firms.

If bidder has not met the percent goal, the bidder must identify on its bid, the DBE/MINORITY s that will be utilized on the project with corresponding total dollar value of the bid. Affidavits A and C listing good faith efforts must be included with the bid.

If bidder has met the percent goal, the bidder must provide Affidavit B within 72 hours of the bid.

The above information must be provided as required. Failure to submit these documents is grounds for rejection of the bid.

D. <u>Communications with DBE/MINORITY</u>

The University shall provide information to DBE/MINORITY firms about the University's construction program. This shall be accomplished by:

- 1. Upon request, sending a notice to each DBE/MINORITY engaged in University construction that is advertised for bids;
- 2. Ensuring that prospective DBE/MINORITY bidders and subcontractors have access to bidding documents; and
- 3. Furnishing DBE/MINORITY subcontractors with the name of the prospective Bidders on a project; upon request, and providing Bidders with the University's list of known DBE/MINORITY firms,

E. Designer

The designer will:

- 1. Attend the scheduled pre-bid conference to assist in the explanation of DBE/MINORITY requirements to the prospective bidders.
- 2. Assist the owner to identify and notify prospective DBE/MINORITY prime and subcontractors of potential contracting opportunities.
- 3. Maintain documentation of any contracts, correspondence, or conversation with DBE/MINORITY firms made in an attempt to meet the goals.

00 22 00A-4 APPENDIX A

- 4. Reviewjointly with the owner, all requirements of these guidelines–(i.e. bidders' proposals for identification of the DBE/MINORITY's that will be utilized with corresponding total dollar value of the bid and affidavit listing Good Faith Efforts, or affidavit of self-performance of work, if the contractor will perform work under contract by its own workforce)–prior to recommendation of award.
- 5. Make documentation showing evidence of implementation of Designer's responsibilities available for review by Owner, upon request.
- F. <u>Anticpated Assurances from Contractors</u>
 - Upon adoption of its verifiable goal, the University is expected to require Bidders on its projects to provide assurances in writing that they will make a good faith effort to solicit DBE/MINORITY s as subcontractors should they be awarded the construction contract. The successful Bidder shall provide the following information to the University and any other information requested in the attached forms:
 - a. The names and addresses of DBE/MINORITY s that will participate in the contract and the names of firms contacted that are not participating; (AFFIDAVIT C)
 - b. A description of the work each named DBE/MINORITY will perform; (AFFIDAVIT C)
 - c. The dollar amount of participation by each DBE/MINORITY (AFFIDAVIT C); and
 - d. Copies of any advertisements or correspondence the Bidder has used to attract DBE/MINORITY subcontractors.
 - 2. A contractor's good faith effort to involve DBE/MINORITY firms in the project can be demonstrated by using, among other factors, the following:
 - a. Contacted DBE/MINORITY s that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State, local government, or University maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed.
 - b. Made the construction plans, specifications and requirements available for review by prospective DBE/MINORITY 's, or providing these documents to them at least 7 days before the bids are due.
 - c. Broken down or combined elements of work into economically feasible units to facilitate DBE/MINORITY participation.
 - d. Worked with minority trade, community, or contractor organizations identified by the University office of Transportation which provide assistance in recruitment of minority businesses.
 - e. Attended pre-bid meetings scheduled by the owner.
 - f. Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.
 - g. Negotiated in good faith with interested DBE/MINORITY s and did not reject them as unqualified without sound reasons based on their capabilities. Any rejection of a DBE/MINORITY based on lack of qualification should have the reasons documented in writing.
 - h. Provided assistance to an otherwise qualified DBE/MINORITY in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters in obtaining the same unit pricing with the bidder's suppliers in order to help DBE/MINORITY in establishing credit.
 - i. Negotiated joint venture and partnership arrangements with DBE/MINORITY in order to increase opportunities for DBE/MINORITY participation on a public construction or repair project when possible.
 - j. Provided quick pay agreements and policies to enable DBE/MINORITY contractors and suppliers to meet cash-flow demands.

G. <u>DBE/MINORITY Responsibilities</u>

- a. DBE/MINORITYs should make every effort to establish contacts and relationships with Contractors for potential future business, including attending pre-bid conferences and subscribing to industry and trade journals
- b. DBE/MINORITYs should also document all contacts and communications made with Contractors above so as to be able to assist the Grievance Designee in determining whether a complaint lodged by a DBE/MINORITY firm against a Bidder for failure to use good faith effort is valid.
- c. In addition, DBE/MINORITYs who are contacted by the Owner or Bidders should respond promptly whether or not they wish to submit a bid.
- d. DBE/MINORITYs are urged to take advantage of appropriate technical assistance and training when it is available.
- H. Penalties for Contractor Noncompliance
 - 1.
- I. Criteria for Certification of Disadvantaged Business Enterprises
 - A Disadvantaged Business Enterprise (DBE/MINORITY) is a business, which is at least 51%, owned and controlled by minority group members or women. A DBE/MINORITY is bona fide only if the minority group or female ownership interests are real and continuing and notcreated solely to meet the DBE/MINORITY requirement. In addition, the DBE/MINORITY must itself perform satisfactory work or services or provide supplies under the contract and not act as a mere conduit.
 - 2. The term "minority" means a person who is a citizen or lawful permanent resident of the United States and who are;
 - a. <u>African-American</u>, that is, a person having origins in any of the original racial groups in Africa.
 - b. <u>Hispanic</u>, that is, a person of Spanish or Portuguese culture with origins in Mexico, South Central America, or the Caribbean Island, regardless of race.
 - c. <u>Native-American</u>. that is, persons having origins in any of the original peoples of North America.
 - d. <u>Asian-American</u>, that is, persons having origin in any of the countries of the Far East, Southeast Asia, or the Indian areas; or
 - e. <u>Female</u>.
 - f. <u>Socially and economically disadvantaged individual</u>-means the same as defined in 15 U.S.C. 637. "Socially disadvantaged individuals are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as a member of a group without regard to their individual qualities." "Economically disadvantaged individuals are those socially disadvantaged individuals whose ability to compete in the free enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business area that are not socially disadvantaged".
 - 3. The term "owned and controlled" means a business, which is a : 1) Sole proprietorship legitimately owned by a person who is a minority or female; 2) a partnership or joint venture controlled by minorities and/or women, and in which at least 51% of the beneficial ownership interests legitimately are held by minorities

and/or women; 3) a corporation or other entity controlled by minorities and/or females, and in which at least 51% of the voting stock or interested 51% of the beneficial ownership interest are legitimately held by minorities and/or females. In addition, these persons must control the management and operations of the business on a day to day basis.

- 4. The President shall appoint a DBE/MINORITY certification Review Committee to resolve any and all disputes concerning a business' eligibility for certification as a DBE/MINORITY. The Committee shall include at least one member from the Transportation Office, one member from the Purchasing Office, one member from the Facilities Office and the University Attorney.
- J. <u>Grievance Procedures</u>.
 - 1. The grievance shall first be discussed with the responsible operating department. If the grievance is not resolved, exercise item #2.
 - 2. The grievance (complaint) must be reported in writing, a brief description and supporting documentation and evidence to the President's designee.
 - 3. The President's designee will review the basis and the issue(s) of the complaint and may request additional supporting evidence. A response to the grievance will be completed within fifteen (15) working days unless circumstances mandate otherwise. Parties involved will be notified of any and all delays in processing the grievance.
 - 4. Any participant not satisfied with the decision of the President's designee may avail himself/herself or any remedies available under the Federal, State and Local law.

To that end, DBE/MINORITY disputes arising under these guidelines should be resolved.

Name of Bidder

I have made a good faith effort to comply under the following areas circled: (a minimum of 5 areas must be checked in order to have achieved a "good faith effort")

- 1 Contacted DBE / minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State or local government-maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed.
- 2 Made the construction plans, specifications and requirements available for review by prospective DBE / minority businesses, or providing these documents to them at least 10 days before the bids are due.
- 3 Broken down or combined elements of work into economically feasible units to facilitate DBE / minority participation.
- 4 Worked with DBE / minority trade, community, or contractor organizations.
- 5 Attended prebid meetings scheduled by the owner.
- 6 Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.
- 7. Negotiated In good faith with interested DBE / minority businesses and did not reject them as unqualified without sound reasons based on their capabilities. Any rejection of a DBE / minority business based on lack of qualification should have the reasons documented in writing.
- Provided assistance to an otherwise qualified DBE / minority business In need of equipment, Ioan capital, Iines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisted DBE / minority businesses in obtaining the same unit pricing with the bidder's supplies in order to help DBE / minority businesses in establishing credit.
- Negotiated joint venture and partnership arrangements with DBE / minority businesses in order to increase opportunities for DBE / minority business participation on a public construction or repair project when possible.
- 10. Provided quick pay agreements and policies to enable DBE / minority contractors and suppliers to meet cash-flow demands.

The undersigned will enter into a formal agreement with the firms listed In Affidavit C conditional upon execution of a contract with the Owner. Failure to abide by this statutory provision will constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of the DBE / minority business commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____

Name of Authorized Officer:

Signature:_____

Title:

State of Alabama, County of ______

Subscribed and sworn to before me this

_____day of

_____20___

Notary Public _____

My commission expires _____

AFFIDAVIT B-ALABAMA A&M UNIVERSITY

Portion of the work to be performed by DBE / firms

***** (NOTE: THIS FORM IS NOT TO BE SUBMITTED WITH THE BID PROPOSAL)******

If the portion of the work to be executed by DBE/MINORITY businesses is equal to or greater than _____% of the bidder's total contract price, then the bidder must complete this affidavit. This affidavit shall be provided by the apparent lowest responsible, responsive bidder within <u>72 hours</u> after notification of being low bidder.

Affidavit of_	I do hereby certify that

on the (Name of bidder)

(Project Name)

Amount of Bid \$_____

I will expend a minimum of _____% of the total dollar amount of the contract with DBE/MINORITY contractors. DBE/MINORITY contractors will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below:

NAME AND PHONE NUMBER	WORK DESCRIPTION	DOLLAR VALUE
1		
2		
3		
4		
5		
6.		

Note: Attach additional sheets if required.

The undersigned will enter into a formal agreement with DBE/MINORITY firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:	Name of Authorized Officer:

Signature:_____

Title:_____

State of Alabama; County of		
Subscribed and sworn to before me this	day of	20
Notary Public		
My commission expires;		

Good Faith Efforts

If the goal of participation by DBE/MINORITY business is not achieved, the Bidder shall provide the following documentation to the Owner of his good faith efforts:

Affidavit of:______

(Name of Bidder)

I do certify the attached documentation as true and accurate representation of my good faith efforts.

	NAME AND PHONE NUMBER	WORK DESCRIPTION	DOLLAR VALUE
1.			
2.			
3.			
4.			
5.			

Documentation of the Bidder's good faith efforts to meet the goals set forth in these provisions. Examples of documentation Include, but are not limited to, the following evidence:

- Copies of solicitations for quotes to at least three (3) DBE/MINORITY business firms from the source list provided by the University for each subcontract to be let under this contract (If 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be sub-contracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when guotes must be received.
- 2. Copies of quotes or responses received from each firm responding to the solicitation.
- 3. A telephone log of follow-up calls to each firm sent a solicitation.

- 4. For subcontracts where a DBE/MINORITY business firm is not considered the lowest responsible sub-bidder, copies of quotes received from all firms submitting quotes for that particular subcontract.
- 5. Documentation of any contacts or correspondence to DBE/MINORITY business, community, or contractor organizations in an attempt to meet the goal.
- 6. Copy of pre-bid roster.
- 7. Letter documenting efforts to provide assistance in obtaining required bonding or Insurance for DBE/MINORITY business.
- 8. Letter detailing reasons for rejection of DBE/MINORITY business due to lack of qualification.
- 9. Letter documenting proposed assistance offered to DBE/MINORITY business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

Failure to provide the documentation as listed In these provisions may result in rejection of the bid and award to the next bwest responsible and responsive bidder.

Date:	_ Name of Authorized Officer:	
	Signature:	
	Title:	

State of Alabama; County of				
Subscribed and sworn to before me this	day of	20		
Notary Public				
My commission expires;				

Alabama A&M University Elmore Health Science Restroom Renovation

00 43 21 - 1 Project No. 21224 SUPPLEMENT A - LIST OF SUBCONTRACTORS

SECTION 00 43 21

SUPPLEMENT A - LIST OF SUBCONTRACTORS

PARTICULARS

- 1.01 HEREWITH IS THE LIST OF SUBCONTRACTORS REFERENCED IN THE BID SUBMITTED BY:
- 1.02 (BIDDER) _____
- 1.03 TO: ALABAMA A & M UNIVERSITY
- 1.04 DATED ______ AND WHICH IS AN INTEGRAL PART OF THE BID FORM.
- 1.05 THE FOLLOWING WORK WILL BE PERFORMED (OR PROVIDED) BY SUBCONTRACTORS AND COORDINATED BY US:

LIST OF SUBCONTRACTORS

WORK SUBJECT DEMOLITION	SUBCONTRACTOR NAME
MILLWORK	
PORCELAIN TILE	
ACOUSTICAL AND DRYWALL	
PAINTING	
PLUMBING	
MECHANICAL	
ELECTRICAL	
END OF SUPPLEMENT A	

SECTION 00 50 00

CONSTRUCTION DOCUMENTS AND FORMS

PART 1 GENERAL

1.01 DOCUMENTS

- A. Construction Contract DCM Form C-5, dated August 2021.
- B. Checklist for Preparation and Approval of Construction Contracts and Bonds DCM Form B-7, dated January 2022.
- C. Certification of Compliance with Section Nine of ACT 2011-535
- D. Performance Bond DCM Form C-6, dated August 2021.
- E. Payment Bond DCM Form C-7, dated August 2021.
- F. General Conditions of the Contract DCM Form C-8, dated August 2021.
- G. Supplementary Conditions of the Contract.
 - 1. Permit Fee & Permit Re-Inspection Fee Calculation Worksheet, Dated December 2021.
 - 2. Appendix A.
 - 3. Appendix B.
 - 4. Appendix C.
- H. Application and Certificate for Payment, DCM Form C-10, dated October 2021.
- I. Inventory of Stored Materials, DCM Form C-10SM, dated October 2021.
- J. Schedule of Values, DCM Form C-10SOV, dated October 2021.
- K. Final Payment Checklist, DCM Form B-13, dated August 2021.
- L. Progress Schedule and Report DCM Form C-11, dated August 2021.
- M. Contract Change Order, DCM Form C-12, dated August 2021.
- N. Change Order Justification, DCM Form B-11, dated August 2021.
- O. Change Order Checklist, DCM Form B-12, dated August 2021.
- P. Certificate of Substantial Completion, DCM Form C-13, dated August 2021.
- Q. Form of Advertisement of Completion, DCM Form C-14, dated August 2021.
- R. Detail of Project Sign, DCM Form C-15, dated August 2021.
- S. Contractor's Affidavit of Paymnet of Debts & Claims, DCM Form C-18, dated August 2021.
- T. Contractor's Affidavit for Relese of Liens, DCM Form C-19, dated August 2021.
- U. Consent of Surety to Final Payment, DCM Form C-20, dated December 2020.
- V. Pre-Construction Conference Checklist, DCM Form B-8, dated November 2021.
- W. State of Alabama Disclosure Statement.

Alabama A&M University Elmore Health Science Restroom Renovation Project No. 21224

00 50 00 - 2 CONSTRUCTION DOCUMENTS AND FORMS

1.02 DOCUMENT AVAILABILITY

- A. A copy of the documents and forms noted above is attached hereto, as provided by the Alabama Department of Finance, Real Property Management.
- B. Additional copies may be obtained from the office of the Alabama Department of Finance, Real Property Management, 770 Washington Avenue, Suite 444, Montgomery, Alabama 36104, phone (334) 242-4082 or www.realproperty.alabama.gov

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
(1) Do not staple this form and/or attachments; use clips. Print single-sided; do not submit double side printed documents

double-side printed documents.

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

DCM (BC) Project No.

CONSTRUCTION CONTRACT

(2) (3)	This Construction Contract is entered into this between the OWNER , Entity Name: Address: Email & Phone #:	day of	in the ye	ear of
(4)	and the CONTRACTOR , Company Name: Address: Email & Phone #:			
(5)	for the WORK of the Project, identified as:			
(6) (7)	The CONTRACT DOCUMENTS are dated ADDENDA		and have	been amended by
(8)	The ARCHITECT is Firm Name: Address: Email & Phone #:			
(9)	The CONTRACT SUM is			
(10)	Dollars (\$) and is the sum of the BID ALTERNATE PRICES:	Contractor's Base Bid for	the Work	and the following
(11)	The CONTRACT TIME is		() calendar days.
	THE OWNER AND THE CONTRACTOR AGR	EE AS FOLLOWS: The	e 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 the Director, Alabama Division of Construction Management, and shall then be substantially completed within the Contract Time.

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

(13) **SPECIAL PROVISIONS** (Special Provisions may be inserted 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 LIC Contractor is currently licensed by the Alabama and that the certificate for such license bears the followi	ENSE: The Contractor does hereby certify that a State Licensing Board for General Contractors ng:	
	License No.: Classification	n(s):	
	Bid Limit:		
	The Owner and Contractor have entered into this Construction Contract as of the date first written about and have executed this Construction Contract in sufficient counterparts to enable each contract 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 the terms and commitments of this Construction Contract do not constitute a debt of the State of Alabama violation of Article 11, Section 213 of the Constitution of Alabama, 1901, as amended Amendment Number 26.		
(15)	APPROVAL	CONTRACTING PARTIES	
	ALABAMA STATE DEPARTMENT OF EDUCATION (SDE) (Required for locally-funded, SDE projects.)	Contractor Company	
	ByDate: State Superintendent of Education	BySignature	
		Owner Entity	
		BySignature	

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

Review/Signature flow: Architect/Engineer (prepare documents) > Contractor (review and sign) > Architect/Engineer (review) > Owner (review and sign) > SDE (review, sign and distribute the fully executed Contract to all parties, and forward a copy to the Alabama Division of Construction Management [DCM]). Note: DCM does not sign fully locally-funded SDE project contract documents.

PREPARATION AND APPROVAL OF CONSTRUCTION CONTRACTS and BONDS SUBMITTED ON PAPER

CHECKLIST DCM Forms C-5, C-6, & C-7

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

CONSTRUCTION CONTRACT - DCM Form C-5 or DCM Form 9-A (PSCA Projects)			
Six copies of documents with original signatures required. The numbers in the left column below correspond to			
numo Schoe	ars in the left margin of the Contract form. If the project is funded partially or fully by the Alabama rubic of and College Authority (PSCA), use DCM Form 9-A instead of DCM Form C-5.		
DUIIC.	france conege Authority (1 Seri), use Dent Form / A molecul of Dent Form e S.		
(1)	PROJECT NUMBER(S): Insert the DCM (BC) Project Number in the block provided.		
	On DCM Form 9-A, also insert the PSCA Project Number in the block provided.		
(2)	DATE: Insert the date upon which the Contractor will sign the contract.		
(3)	OWNER: Insert the full, legal name, address, email, and telephone number of the Owner (Awarding Authority).		
	• On DCM Form 9-A, insert the name, address, email, and telephone number of the Local Owner (city or		
	county school board, college, university, etc.) after "Alabama Public School and College Authority"		
(4)	CONTRACTOR: Insert the Contractor's full, legal company name, correct mailing address, email, and		
l	telephone number. For State Agency projects, the Contractor Company name and address must match the name		
İ	and address registered in the State of Alabama Accounting and Resource System (STAARS) used by the State		
l	to pay Vendors. The Contractor Company name and address must be consistent across all documents in the		
l	Same contract package, in order to avoid STAARS rejection.		
İ	• On DOM FORM 9-A. The Contractor Company hame and address must be consistent in STAAPS used by the State to pay Vendors. The Contractor Company name and address must be consistent		
l	across all documents in the same contract nackage in order to avoid STAARS rejection		
(5)	The WORK . Insert the complete name of the Project: same as in the Bid Documents		
(6)	CONTRACT DOCUMENTS: Insert the date of the Bid Documents		
(7)	ADDENDA: Identify, by number and date, all pre-bid Addenda that were issued to the Bid Documents. If		
	none were issued, insert None . All Addenda snall be sublitited to DCIVI for review prior to contract issuance.		
(8)	ARCHITECT: Insert the full, legal name, address, email, and telephone number of the Project Architectural or		
(0)	Engineering firm.		
(9)	CONTRACT SUM: The Contract Sum is the total of the Contract's Base Bid and accepted Bid Alternate		
l	with the CERTIFIED TARIII ATION OF RIDS		
(10)	RID AI TERNATE PRICES . Identify which if any Bid Alternate Prices are accepted and included in		
(10)	the Contract Sum by inserting either (a) "No Alternate Prices Requested in Bid". (b) "No Alternate Prices		
l	Accepted". or (c) a listing of the accepted Alternates by number and dollar amount.		
(11)	The CONTRACT TIME: State the Contract Time in words and in figures.		
(12)	LIOUIDATED DAMAGES: If the Owner has computed a daily rate for liquidated damages, insert the		
()	amount in both words and figures in the spaces provided.		
(13)	SPECIAL PROVISIONS: This space may be used to incorporate Special Provisions into the Contract,		
	such as unit prices, compliance with enacted provisions, and value engineering. If the solicitation for bids		
İ	required Unit Prices, insert a statement of which Unit Prices, if any, are accepted and incorporated into the		
İ	Contract. If more space is needed, Special Provisions may be stated on an attachment that is cited in the		
İ	Special Provisions section.		
İ	• DCM Form 9-A is published bearing Special Provision "A. Severable Payments", which is where the		
İ	portions of the Contract Sum to be paid by the PSCA and the Local Owner are to be stated. Obtain these		
İ	amounts from Local Owner and insert them in the spaces provided. Other Special Provisions, such as		
(1.4)	disposition of Unit Prices, may be inserted below this provision.		
(14)	STATE GENERAL CONTRACTOR'S LICENSE: Insert the Contractor's current state general		

contracting license number, bid limit, and classification in the spaces provided.

(15)	SIGNATURES - APPROVING and CONTRACTING PARTIES 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		
(0)	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 six 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 six (6) 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.

<u>Additional Revised Contract Document Fee</u>: 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.

<u>Basic Permit Fee</u>: 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.

<u>Fees may be paid</u> 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.

CERTIFICATION OF COMPLIANCE WITH SECTION NINE OF ACT 2011-535

The Undersigned Officer of _________(Company) certifies to the Board of Trustees, Alabama A&M University, that the Company shall not knowingly employ, hire for employment, or continue to employ an unauthorized alien and does attest to such by sworn affidavit signed before a notary. Furthermore, the Company certifies that it has provided its one-page E-Verity Company Profile Document to the University. During the performance of the contract, the Company shall participate in the E-Verify Program and shall verify every employee that is required to be verified according to the applicable federal rules and regulations. The Company also certifies that it will obtain sworn affidavits signed by a notary from any subcontractors furnishing goods/services under this contract attesting to the fact that they do not employ, hire for employment, or continue to employ an unauthorized alien and that they participate in the E-Verify Program and verify every employee that is required to be verified according to the applicable federal to the fact that they participate in the E-Verify Program and verify every employee that is required to be verified according to the applicable alien and that they participate in the E-Verify Program and verify every employee that is required to be verified according to the applicable federal rules and regulations.

PRINT COMPANY NAME

SIGNATURE OF COMPANY OFFICER

PRINT TITLE OF COMPANY OFFICER

DATE

Sworn and subscribed to before me this _____ day of _____, 20____.

NOTARY PUBLIC

My commission expires: _____

(1)	PERFORMANCE BOND	SURETY'S BOND NUMBER	
	Do not staple this form; use clips.		
(2)	The PRINCIPAL (<i>Company name and address of Contractor as appears in th</i> Name: Address:	e Construction Contract)	
(3)	The SURETY (<i>Company name and primary place of business</i>) Name: Address:		
(4)	The OWNER (<i>Entity name and address, same as appears in the Construction C</i> Name: Address:	ontract)	
(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 TH hereby bind ourselves, our heirs, executors, administrators, succe the Penal Sum stated above for the performance of the Contract accord with the requirements of the Contract Documents, which a If the Contractor performs the Contract, and Contract Chang Contract Documents, then this obligation shall be null and void force and effect.	E SURETY , jointly and severally essors, and assigns to the Owner in t, and Contract Change Orders, in re incorporated herein by reference e Orders, in accordance with th t; otherwise it shall remain in ful	, n n : e 1

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.

- **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.

SIGNED AND SEALED this da	y of,
SURETY:	CONTRACTOR as PRINCIPAL:
Company Name	Company Name
BySignature	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 six bond forms to be attached to each of the six contract forms per project.

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

(9 &

(1)	PAYMENT BOND	SURETY'S BOND NUMBER
	Do not staple this form; use clips.	
(2)	The PRINCIPAL (<i>Company name and address of Contractor, same as appea</i> Name: Address:	rs in the Construction Contract)
(3)	The SURETY (<i>Company name and primary place of business</i>) Name: Address:	
(4)	The OWNER(s) (Entity name and address, same as appears in the Construction Name: Address:	on Contract)
(5)	The PENAL SUM of this Bond (the Contract Sum)	ollars (\$).
(6)	DATE of the Construction Contract:	
(7)	The PROJECT : (Same as appears in the Construction Contract)	
	1. WE, THE PRINCIPAL (hereinafter "Contractor") AND THE SURETY, jointly and severally, hereby bind ourselves, our heirs, executors, administrators, successors, and assigns to the Owner in the Penal Sum stated above to promptly pay all persons supplying labor, materials, or supplies for or in the prosecution of the Contract, which is incorporated herein by reference, and any modifications thereof by Contract Change Orders. If the Contractor and its Subcontractors promptly pay all persons supplying labor, materials, or supplies for or in the prosecution of the Contract Change Orders. If the Contractor and its Contract and Contract Change Orders, then this obligation shall be null and void; otherwise to remain and be in full force and effect.	
	2. The Penal Sum shall remain equal to the Contract Sum as the Contract Sum is adjusted by Contra 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 waive notification of any Contract Change Orders involving only extension of the Contract Time.	

Page 1 of 2

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

3. Any person that has furnished labor, materials, or supplies for or in the prosecution of the Contract

(8) SIGNED AND SEALED this _____ day of _____

SURETY: (9 & 10)

Company Name

Company Name

CONTRACTOR as PRINCIPAL:

By

Signature

Name and Title

Name and Title

Signature

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

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

By

GENERAL CONDITIONS of the CONTRACT

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ARTICLE 1 DEFINITIONS

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

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

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

supports, structures, or construction which will not produce the results required by the Contract Documents, and (5) materials or equipment rendered unsuitable for incorporation into the Work due to improper storage or protection.

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

ARTICLE 2 INTENT and INTERPRETATION of the CONTRACT DOCUMENTS

A. <u>INTENT</u>

It is the intent of the Contract Documents that the Contractor shall properly execute and complete the Work described by the Contract Documents, and unless otherwise provided in the Contract, the

Contractor shall provide all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work, in full accordance with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

B. <u>COMPLEMENTARY DOCUMENTS</u>

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

C. ORDER of PRECEDENCE

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

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

D. ORGANIZATION

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

E. <u>INTERPRETATION</u>

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

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

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

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

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

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

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

F. <u>SEVERABILITY</u>.

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

ARTICLE 3 CONTRACTOR'S REPRESENTATIONS

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

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

ARTICLE 4 DOCUMENTS FURNISHED to CONTRACTOR

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

ARTICLE 5 OWNERSHIP of DRAWINGS

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

ARTICLE 6 <u>SUPERVISION, SUPERINTENDENT, and EMPLOYEES</u>

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

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

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

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

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

B. <u>SUPERINTENDENT</u>

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

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

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

C. <u>EMPLOYEES</u>

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

ARTICLE 7 REVIEW of CONTRACT DOCUMENTS and FIELD CONDITIONS by CONTRACTOR

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

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

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

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

ARTICLE 8 SURVEYS by CONTRACTOR

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

ARTICLE 9 SUBMITTALS

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

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

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

with the Contractor's intended Construction Methods.

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

H. <u>DEVIATIONS</u>

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

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

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

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

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

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

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

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

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

The Work shall be constructed in accordance with approved Submittals.

ARTICLE 10 DOCUMENTS and SAMPLES at the SITE

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

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

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

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

C. <u>RECORD SET</u>

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

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

ARTICLE 11 <u>"AS-BUILT" DOCUMENTS</u>

- 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 <u>PROGRESS SCHEDULE</u>

(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. <u>GENERAL</u>

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

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

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

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

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

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

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

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

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

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

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

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

C. **INSPECTIONS by the ARCHITECT**

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

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

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

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

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

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

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

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

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

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

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

D. **INSPECTIONS by the DCM PROJECT INSPECTOR**

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

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

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

(2) The DCM Project Inspector shall have the authority to:(a) reject Work that is not in compliance with the State Building Code adopted by the DCM,

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

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

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

E. <u>UNCOVERING WORK</u>

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

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

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

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

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

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

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

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

ARTICLE 17 CORRECTION of DEFECTIVE WORK

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

ARTICLE 18 DEDUCTIONS for UNCORRECTED WORK

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

ARTICLE 19 CHANGES in the WORK

A. <u>GENERAL</u>

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

authorized only by the Owner.

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

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

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

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

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

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

B. DETERMINATION of ADJUSTMENT of the CONTRACT SUM

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 20 CLAIMS for EXTRA COST or EXTRA WORK

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

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

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

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

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

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

ARTICLE 21 DIFFERING SITE CONDITIONS

A. <u>DEFINITION</u>

"Differing Site Conditions" are:

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

B. <u>PROCEDURES</u>

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

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

ARTICLE 22 CLAIMS for DAMAGES

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

ARTICLE 23 DELAYS

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

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

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

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

ARTICLE 24 RESOLUTION of CLAIMS and DISPUTES

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

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

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

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

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

C. GOOD FAITH EFFORT to SETTLE

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

D FINAL RESOLUTION for STATE-FUNDED CONTRACTS

(1) If the Contract is funded in whole or in part with state funds, the final Resolution of Claims
and Disputes which cannot be resolved by the Contractor (or its Surety) and Owner shall be by the Director, whose decision shall be final, binding, and conclusive upon the Contractor, its Surety, and the Owner.

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

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

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

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

ARTICLE 25 OWNER'S RIGHT to CORRECT DEFECTIVE WORK

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

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

A. STOPPING the WORK for CAUSE

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

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

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

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

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

ARTICLE 27 OWNER'S RIGHT to TERMINATE CONTRACT

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

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

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

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

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

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

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

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

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

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

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

written Notice of Termination.

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

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

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

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

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

(f) If the Owner's cost of completing the Work, including correction of Defective Work, compensation for additional architectural, engineering, managerial, and administrative services, and reasonable attorneys' fees due to the default and termination, is less than the unpaid balance of the Contract Sum, the excess balance less liquidated damages for delay shall be paid to the Contractor. If such cost to the Owner including attorney's fees, plus liquidated damages, exceeds the unpaid balance of the Contract Sum, the Contract Sum, the 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 over \$50,000):**

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

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

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

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

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

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

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

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

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

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

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

(a) stop Work as specified in the notice;

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

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

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

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

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

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

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

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

ARTICLE 29 PROGRESS PAYMENTS

A. FREQUENCY of PROGRESS PAYMENTS

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

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

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

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

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

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

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

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

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

D. MATERIALS STORED OFF SITE

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

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

Owner;

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

E. <u>RETAINAGE</u>

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

(2) In making progress payments the Owner shall retain five percent of the estimated value of Work performed and the value of the materials stored for the Work; but after retainage has been held upon fifty percent of the Contract Sum, no additional retainage will be withheld.

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

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

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

G. <u>PAYMENT ESTABLISHES OWNERSHIP</u>

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

ARTICLE 30 CERTIFICATION and APPROVALS for PAYMENT

A. The Architect's review, approval, and certification of Applications for Payment shall be based on the Architect's general knowledge of the Work obtained through site visits and the information provided by the Contractor with the Application. The Architect shall not be required to perform

exhaustive examinations, evaluations, or estimates of the cost of completed or uncompleted Work or stored materials to verify the accuracy of amounts requested by the Contractor, but the Architect shall have the authority to adjust the Contractor's estimate when, in the Architect's reasonable opinion, such estimates are overstated or understated.

B. Within seven days after receiving the Contractor's monthly Application for Payment, or such other time as may be stated in the Contract Documents, the Architect will take one of the following actions:

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

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

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

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

ARTICLE 31 PAYMENTS WITHHELD

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

Subcontractor, or anyone for whose acts they may be liable;

- (6) reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance is insufficient to cover applicable liquidated damages; or
- (7) the Contractor's persistent failure to conform to the requirements of the Contract Documents.
- **B.** If the Owner deems it necessary to withhold payment pursuant to preceding Paragraph A, the Owner will notify the Contractor and Architect in writing of the amount to be withheld and the reason for same.
- C. The Architect shall not be required to withhold payment for completed or partially completed Work for which compliance with the Contract Documents remains to be determined by Specified Inspections or Final Inspections to be performed in their proper sequence. However, if Work for which payment has been approved, certified, or made under an Application for Payment is subsequently determined to be Defective Work, the Architect shall determine an appropriate amount that will protect the Owner's interest against the Defective Work.

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

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

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

ARTICLE 32 SUBSTANTIAL COMPLETION

- A. Substantial Completion is the stage in the progress of the Work when the Work or designated portion of the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use without disruption or interference by the Contractor in completing or correcting any remaining unfinished Work ("punch list" items). Substantial Completion of the Work, or a designated portion of the Work, is not achieved until so agreed in a Certificate of Substantial Completion signed by the Contractor, Architect, Owner, and Technical Staff of the Alabama Division of Construction Management.
- **B.** The Contractor shall notify the Architect in writing when it considers the Work, or a portion of the Work which the Owner has agreed to accept separately, to be substantially complete and ready for a Final Inspection pursuant to Article 16. In this notification the Contractor shall identify any items remaining to be completed or corrected for Final Acceptance prior to final payment.

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

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

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

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

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

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

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

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

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

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

ARTICLE 33 OCCUPANCY or USE PRIOR to COMPLETION

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

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

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

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

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

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

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

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

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

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

ARTICLE 34 FINAL PAYMENT

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

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

- (1) Full execution of a Certificate of Substantial Completion for the Work, or each designated portion of the Work.
- (2) Final Acceptance of the Work.
- (3) The Contractor's completion, to the satisfaction of the Architect and Owner, of all documentary requirements of the Contract Documents; such as delivery of "as-built" documents, operating and maintenance manuals, warranties, etc.
- (4) Delivery to the Owner of a final Application for Payment, prepared by the Contractor and approved and certified by the Architect. Architect prepares DCM Form B-13: Final Payment Checklist and forwards it to the Owner along with the final Application for Payment.
- (5) Completion of an Advertisement for Completion pursuant to Paragraph C below.
- (6) Delivery by the Contractor to the Owner through the Architect of 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. <u>ADVERTISEMENT for COMPLETION</u>

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

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

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

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

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

(2) An affidavit under oath, if required, stating that so far as the Contractor has knowledge or 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. <u>GENERAL WARRANTY</u>

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

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

(1) If, within one year after the date of Substantial Completion of the Work or each designated portion of the Work (or otherwise as agreed upon in a mutually-executed Certificate of Substantial Completion), any of the Work is found to be Defective Work, the Contractor shall promptly upon receipt of written notice from the Owner or Architect, and without expense to either, replace or correct the Defective Work to conform to the requirements of the Contract Documents, and repair all damage to the site, the building and its contents which is the result of Defective Work or its replacement or correction.

(2) The one-year warranty for punch list items shall begin on the Date of Substantial Completion if they are completed or corrected within the time period allowed in the Certificate of Substantial Completion in which they are recorded. The one-year warranty for punch list items that are not

completed or corrected within the time period allowed in the Certificate of Substantial Completion, and other Work performed after Substantial Completion, shall begin on the date of Final Acceptance of the Work. The Contractor's correction of Work pursuant to this warranty does not extend the period of the warranty. The Contractor's one-year warranty does not apply to defects or damages due to improper or insufficient maintenance, improper operation, or wear and tear during normal usage.

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

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

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

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

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

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

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

E. ASSUMPTION of GUARANTEES of OTHERS

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

ARTICLE 36 INDEMNIFICATION AGREEMENT

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

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

ARTICLE 37 CONTRACTOR'S and SUBCONTRACTORS' INSURANCE

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

A. <u>GENERAL</u>

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

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

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

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

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

(5) MAXIMUM DEDUCTIBLE. Self-insured retention, except for qualified self-insurers or

group self-insurers, in any policy shall not exceed \$25,000.00.

B. 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:

Coverage

.1 General Aggregate

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

- Limit \$ 2,000,000.00 per Project \$ 2,000,000.00 per Project \$ 1,000,000.00 per Occurrence \$ 1,000,000.00
- (b) Additional Requirements for Commercial General Liability Insurance:
 - .1 The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants and employees as additional insureds, state that this coverage shall be primary insurance for the additional insureds; and contain no exclusions of the additional insureds relative to job accidents.
 - .2 The policy must include separate per project aggregate limits.

(3) COMMERCIAL BUSINESS AUTOMOBILE LIABILITY INSURANCE

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

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

(4) COMMERCIAL UMBRELLA LIABILITY INSURANCE

(a) Commercial Umbrella Liability Insurance to provide excess coverage above the

Commercial General Liability, Commercial Business Automobile Liability and the Workers' Compensation and Employer's Liability to satisfy the minimum limits set forth herein.

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

- **.1** \$ 5,000,000 per Occurrence
- **.2** \$ 5,000,000 Aggregate
- (c) Additional Requirements for Commercial Umbrella Liability Insurance:
 - .1 The policy shall name the Owner, Architect, Alabama Division of Construction Management, State Department of Education (if applicable), and their agents, consultants, and employees as additional insureds.
 - .2 The policy must be on an "occurrence" basis.

(5) BUILDER'S RISK INSURANCE

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

(b) The policy shall be endorsed as follows:

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

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

(ii) Partial or complete occupancy by Owner; or

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

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

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

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

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

D. 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 as

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

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

E. WAIVERS of SUBROGATION

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

ARTICLE 38 PERFORMANCE and PAYMENT BONDS

A. <u>GENERAL</u>

Upon signing and returning the Construction Contract to the Owner for final approval and execution, the Contractor shall, at the Contractor's expense, furnish to the Owner a Performance Bond and a Payment Bond (P&P Bonds), DCM Forms C-6 and C-7 as contained in the Project

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

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

B. <u>PERFORMANCE BOND</u>

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

C. <u>PAYMENT BOND</u>

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

D. <u>CHANGE ORDERS</u>

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

E. <u>EXPIRATION</u>

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

ARTICLE 39 ASSIGNMENT

The Contractor shall not assign the Contract or sublet it as a whole nor assign any moneys due or to

become due to the Contractor thereunder without the previous written consent of the Owner (and of the Surety, in the case of a bonded Construction Contract). As prescribed by the Public Works Law, the Contract shall in no event be assigned to an unsuccessful bidder for the Contract whose bid was rejected because the bidder was not a responsible or responsive bidder.

ARTICLE 40 CONSTRUCTION by OWNER or SEPARATE CONTRACTORS

A. 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. <u>COORDINATION</u>

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

C. CONDITIONS APPLICABLE to WORK PERFORMED by OWNER

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

D. <u>MUTUAL RESPONSIBILITY</u>

(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 <u>SUBCONTRACTS</u>

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

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

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

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

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

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

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

ARTICLE 43 CASH ALLOWANCES

- A. All allowances stated in the Contract Documents shall be included in the Contract Sum. Items covered by allowances shall be supplied by the Contractor as directed by the Architect or Owner and the Contractor shall afford the Owner the economy of obtaining competitive pricing from responsible bidders for allowance items unless other purchasing procedures are specified in the Contract Documents.
- **B.** Unless otherwise provided in the Contract Documents:
 - (1) allowances shall cover the cost to the Contractor of materials and equipment delivered to the

Project site and all applicable taxes, less applicable trade discounts;

- (2) the Contractor's costs for unloading, storing, protecting, and handling at the site, labor, installation, overhead, profit and other expenses related to materials or equipment covered by an allowance shall be included in the Contract Sum but not in the allowances;
- (3) if required, the Contract Sum shall be adjusted by Change Order to reflect the actual costs of an allowance.
- **C.** Any selections of materials or equipment required of the Architect or Owner under an allowance shall be made in sufficient time to avoid delay of the Work.

ARTICLE 44 <u>PERMITS, LAWS, and REGULATIONS</u>

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

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

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

B. <u>TAXES</u>

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

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

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

D. ALABAMA IMMIGRATION LAW

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

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

all damages resulting therefrom.

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

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

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

F. ACCOUNTING OF SALES TAX EXEMPT PROJECTS

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

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

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

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

ARTICLE 46 USE of the SITE

- **A.** The Contractor shall confine its operations at the Project site to areas permitted by the Owner and by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials, equipment, employees' vehicles, or debris. The Contractor's operations at the site shall be restricted to the sole purpose of constructing the Work, use of the site as a staging, assembly, or storage area for other business which the Contractor may undertake shall not be permitted.
- **B.** Unless otherwise provided in the Contract Documents, temporary facilities, such as storage sheds, shops, and offices may be erected on the Project site with the approval of the Architect and Owner.

Such temporary buildings and/or utilities shall remain the property of the Contractor, and be removed at the Contractor's expense upon completion of the Work, unless the Owner authorizes their abandonment without removal.

ARTICLE 47 CUTTING and PATCHING

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

ARTICLE 48 IN-PROGRESS and FINAL CLEANUP

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

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

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

B. FINAL CLEAN-UP

(1) Before Substantial Completion or Final Acceptance is achieved, the Contractor shall have removed from the Owner's property all construction equipment, tools, and machinery; temporary structures and/or utilities including the foundations thereof (except such as the Owner permits in writing to remain); rubbish, debris, and waste materials; and all surplus materials, leaving the site clean and true to line and grade, and the Work in a safe and clean condition, ready for use and operation.

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

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

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

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

(d) Cleaning all tile, floor finish of all kinds: Removal of all splatters, stains, paint, dirt,

and dust, the washing and polishing of all floors as recommended by the manufacturer or required by the Architect.

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

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

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

ARTICLE 49 LIQUIDATED DAMAGES

- **A.** Time is the essence of the Contract. Any delay in the completion of the Work required by the Contract Documents may cause inconvenience to the public and loss and damage to the Owner including but not limited to interest and additional administrative, architectural, inspection and supervision charges. By executing the Construction Contract, the Contractor agrees that the Contract Time is sufficient for the achievement of Substantial Completion.
- **B.** The Contract Documents may provide in the Construction Contract or elsewhere for a certain dollar amount for which the Contractor and its Surety (if any) will be liable to the Owner as liquidated damages for each calendar day after expiration of the Contract Time that the Contractor fails to achieve Substantial Completion of the Work. If such daily liquidated damages are provided for, Owner and Contractor, and its Surety, agree that such amount is reasonable and agree to be bound thereby.
- **C.** If a daily liquidated damage amount is not otherwise provided for in the Contract Documents, a time charge equal to six percent interest per annum on the total Contract Sum may be made against the Contractor for the entire period after expiration of the Contract Time that the Contractor fails to achieve Substantial Completion of the Work.
- **D.** The amount of liquidated damages due under either paragraph B or C, above, may be deducted by the Owner from the moneys otherwise due the Contractor in the Final Payment, not as a penalty, but as liquidated damages sustained, or the amount may be recovered from Contractor or its Surety. If part of the Work is substantially completed within the Contract Time and part is not, the stated charge for liquidated damages shall be equitably prorated to that portion of the Work that the Contractor fails to substantially complete within the Contract Time. It is mutually understood and agreed between the parties hereto that such amount is reasonable as liquidated damages.

ARTICLE 50 USE of FOREIGN MATERIALS

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

ARTICLE 51 PROJECT SIGN

- A. <u>Fully locally-funded State Agency and Public Higher Education projects</u>: 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.** <u>Fully locally-funded K-12 school projects</u>: 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. <u>Partially or fully PSCA-funded projects</u>: 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 PSCAfunded 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.

SUPPLEMENTARY CONDITIONS OF THE CONTRACT

PART 1 GENERAL

1.01 PURPOSE

- A. The changes, deletions and omissions to DCM Form C-8, General Conditions of the Contract, relate to the limited contract period of the project.
 - 1. Article 4 Documents Furnished to Contractor: Zero (0) sets of Drawings and Project Manuals will be furnished to the Contractor by the Architect without charge (this includes the set or sets that the Contractor used in the bidding process). Other copies requested will be furnished at reproduction cost.
 - 2. Article 16 Inspection of the Work:
 - a. Add Paragraph G: Follow-up observations will be performed by the Architect or Architect's Consultant each time a punchlist is generated to ensure that punchlist items have been corrected. The cost of additional observations required due to incomplete correction of punchlist items will be the responsibility of the Contractor at the rate of \$150.00 per hour, including travel time.

Shop Drawings and/or submittals requiring resubmission to the Architect due to non-compliance with the Contract Documents and /or incompleteness shall be thoroughly reviewed by the Contractor prior to delivery to the Architect for review. The Contractor shall ensure the completeness and compliance of the submittal materials. Cost incurred by the Owner for review of submittals after the second submittal is rejected will be the responsibility of the Contractor at the rate indicated in the paragraph above.

- b. Add Paragraph H Punch List Expectations and its subparagraphs to read as follows:
 - H. Punch List Expectations:

The General Contractor is to generate a punch list; this list is to be sent to the Architect. After the Architect receives the General Contractors punch list, the Architect will generate a punch list, which will be distributed appropriately. The Architect will not recheck the punch list until the General Contractor notifies the Architect that all punch items are finished and all Subcontractors affected have signed off on. The General Contractor is responsible for getting the punch lists signed off on and send the signed lists to the Architect.

- 3. Article 19 Changes in the work:
 - b. Paragraph $\tilde{B}(3)$ (f) add subparagraph 1 and its subparagraphs to read as follows:
 - 1. The following fees apply to changes in the Work:
 - a. 15 percent overhead and profit on the net cost of own Work;
 - b. 10 percent on the cost of Work done by any subcontractor.
 - c. The Agreement identifies the overhead and profit fees applicable for changes in the Work, whether additions to or deductions from the Work on which the Contract Sum is based and identifies the fees for subcontract work for changes (both additions and deductions in the Work. The Contractor shall apply fees as noted, to the Subcontractor's gross (net plus fee) costs on addition work.
 - c. Paragraph D add subparagraph (8) to read as follows:
 - (8). All deductive Change Orders are to include a minimum 5 percent return for profit and overhead.
- 4. Article 23 Delays: Paragraph B (2) delete in its entirety. Time extensions as they relate to weather are outlined in the appendix "WEATHER DELAYS" attached hereto.
- 5. Article 29 Schedule of Values: Add Article 29 in "Appendix C" attached hereto.
- 6. Article 44 Permits, Laws, and Regulations,
 - a. Paragraph A Permits, Fees, and Notices The General Contractor is not required to secure and pay for a building permit from the local inspection department.

SUPPLEMENTARY CONDITIONS OF THE CONTRACT

PAGE-2

- b. Paragraph A Add subparagraph (1) (a) to read as follows, "Public Works Projects Bidding After October 1, 2014, the General Contractor shall secure and pay for building permit fee required under Administrative Rule 170X-8 of The Alabama Building Commission. See attached Permit Fee Calculation Worksheet."
- 7. Article 49 Liquidated Damages: Add Article 49 in "Appendix B" attached hereto.
- PART 2 PRODUCTS NOT USED
- PART 3 EXECUTION NOT USED

END OF SECTION



ALABAMA DEPARTMENT OF FINANCE REAL PROPERTY MANAGEMENT Division of Construction Management

Revised December 2021

Department Use Only				
Invoice #				
Date Paid				
Confirmation #				

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

PERMIT FEE & PERMIT F	RE-INSPECTION FEE	CALCULATON WORKSHEET

DCM (BC) #	Date	
Project Name; Owner/Architect/Engineer Project # & Pl	nase/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-Inspec Flat Fee	tion 9.
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:

<u>Basic Permit Fee</u>: 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.

<u>Permit Re-Inspection Fee</u>: 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.

APPENDIX A

SUPPLEMENTARY CONDITIONS OF THE CONTRACT - WEATHER DELAYS

EXTENSIONS OF CONTRACT TIME

Extension of time on the basis of weather may be granted only for the number of Weather Delay Days in excess of the number of days listed as the Standard baseline for the month.

STANDARD BASELINE FOR AVERAGE CLIMATIC RANGE

Based on weather data available from the National Oceanic and Atmospheric Administration a Standard Baseline of average climatic range for North Alabama has been determined.

Standard Baseline shall be regarded as the normal and anticipatable number of calendar days for each month during which construction activity shall be expected to be prevented and suspended by cause of adverse weather. Suspension of construction activity for the number of days each month as listed in the Standard Baseline is included in the Work and is not eligible for extension of Contract Time.

Standard Baseline for precipitation is as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
06	09	08	08	07	06	07	08	03	05	05	08

Standard Baseline for temperature is as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
06	02	01	00	00	00	00	00	00	00	01	02

ADVERSE WEATHER AND WEATHER DELAY DAYS

Adverse Weather is defined as the occurrence of one or more of the following conditions which prevents exterior construction activity or access to the site within twenty-four (24) hours:

- 1. Precipitation (rain, snow, or ice) in excess of one-tenth (0.10") liquid measure.
- 2. Temperatures which do not rise above 32 degrees F by 10:00 a.m.
- 3. Temperatures which do not rise above that specified by day's construction activity by 10:00 a.m., if any is specified.
- 4. Sustained wind in excess of twenty-five (25) m.p.h.
- 5. Standing snow in excess of one inch (1.00")

Adverse Weather may include, if appropriate, "dry-out" or "mud" days when all the following conditions are met:

1. For rain days above the standard baseline.

APPENDIX A-2 SUPPLEMENTARY CONDITIONS OF THE CONTRACT

- 2. Only if there is a hindrance to site access or sitework, such as excavation backfill, and footings.
- 3. At a rate no greater than 1 make-up day for each day or consecutive days or rain beyond the standard baseline that totals 1.0 inch or more, liquid measure, unless specifically recommended otherwise by the Designer.

A Weather Delay Day may be counted if adverse weather prevents work on the project for fifty percent (50%) or more of the contractor's scheduled work day, including a weekend day or holiday.

REPORTING OF WEATHER DELAYS

Contractor will provide written notice to the Architect, and Construction Manager, by fax, of a day claimed as a potential basis for delay. Notice of a potential basis for delay must be received by the Architect by 9:00 a.m. on the day immediately following the day claimed. At the end of the month the total days claimed will be compared to the Standard Baseline. Bad weather days exceeding the days indicated on the Standard Baseline will be granted as an extension of time.

END OF APPENDIX A

Alabama A&M University Elmore Health Science Restroom Renovation Project No. 21224

APPENDIX B

SUPPLEMENTARY CONDITIONS OF THE CONTRACT - ARTICLE 49

49. LIQUIDATED DAMAGES:

- A. The Substantial Completion date of this project is critical due to owner occupancy. Delays in the completion of the work as provided for in the Contract Documents will cause undue expense and hardship for the Owner.
- B. Refer to Section 01 10 00 Summary for contract time.
- C. LIQUIDATED DAMAGES:
 - 1. A charge of 6 percent per annum will be made against the General Contractor for not meeting the Date of Substantial Completion.
 - 2. The amount of the total charges shall be deducted by the Owner from the Final estimate and shall be retained by the Owner out of moneys otherwise due the Contractor in the Final Payment, not as a penalty, but as liquidated damages sustained, it being mutually understood and agreed between the parties hereto that such amount is reasonable as liquidated damages.
- D. Liquidated damages will be processed by change order to the contract price.

END OF APPENDIX B

Alabama A&M University Elmore Health Science Restroom Renovation Project No. 21224

APPENDIX C

SUPPLEMENTARY CONDITIONS OF THE CONTRACT – ARTICLE 29

29. SCHEDULE OF VALUES:

A. In accordance with the General Conditions of the Contract, Article 29, Paragraph B, the Contractor shall submit for approval a Schedule of Values as shown below. Items that are not applicable to this project may be omitted.

No.	Divisions of Work					
1	Bonds, Insurance & Permits					
2	General Conditions					
3	Allowances					
4	Contingencies					
5	Demolition					
6	Rough & Finish Carpentry					
7	Drywall / Acoustical					
8	Ceramic / Hard Tile					
9	Painting					
10	Specialties					
11	Plumbing					
12	HVAC					
13	Electrical					

END OF SECTION
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: PRO	DJECT:
Entity Name:	
Address:	
FROM CONTRACTOR: Company Name & Address, which must exactly match AR	CHITECT / ENGINEER:
co. name & payment	n Name:
address spelling as registered in State Add	ress
of AL Accounting	
& Resource System (STAARS) to avoid	
STAARS rejection:	
STAARS Vendor#:	
A. Total Original Contract	\$
B. Fully Executed (signed by all parties) Change Order(s) Nur	nbers through +\$
C Total Contract To Date	
C. Total Contract To Date	Φ
1. Work Completed to Date per attached Schedule of Va	ues ^{(Form C-10SOV's} Column F Total) \$
2. Materials Presently Stored (When this amount is greater than \$ C-10SM: Inventory of Stored Materi	0.00, attach Form als, or similar list) +\$
3. Total Work Completed to Date & Materials Presently Store	d(% of Contract To Date) \$
4. Less Retainage (If 1 total Work Completed to Date & Materials Presently) or equal to 50% of Total Contract to Date (C), Retainage (Date #3 exceeds 50% of C and un util project is comple	Stored (#3) is less than $e = #3 \times 0.05$. $e = \text{Retuining} = C \times 0.025$
5. Total Due	point below for requirements.) \$
6. Less Total Previous Payments Billed (Must exactly match application.)	#5 Total Due from previous # 6 is \$0.00 if there is no -\$
7. Balance Due This Estimate	(lication)
CONTRACTOR'S CERTIFICATION	ARCHITECT'S / ENGINEER'S CERTIFICATION
The undersigned Contractor certifies that to the best of his knowledge, information, belief the Work covered by this Application for Payment has been complete	and In accordance with the Contract Documents, the Architect/
accordance with the Contract Documents, that all amounts have been paid by him	for Engineer's knowledge and belief, the Work has progressed to the
Work for which previous Certificates for Payments were issued and payments rece	point indicated herein, the quality of the Work is in accordance with
from the Owner and that current payment shown herein has not yet been received.	the Contract Documents, and the Contractor is entitled to payment of the amount approved.
By: Date:	-
	By
Name & Title	Architect's / Engineer's Signature
Sworn and subscribed before me this day of	
Seal: Day Month, Year	Name & Title
	Date
Notary Public's Signature	—
INSTRUCTIONS	APPROVAL
• Four copies of pay. app., each with original signatures and all attachments require	d.
• Date of first payment application cannot precede the Notice to Proceed's Begin Date	e.
• A change order must be fully executed before inclusion on a payment application.	Owner Entity
• 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 navment applications 	By
• One payment application per month may be submitted.	Signature
• 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 included the	
change orders must be fully executed (signed by all parties) and included, the Certificate of Substantial Completion for entire work is fully executed, and all other	Name & Title
change orders must be fully executed (signed by all parties) and included, the Certificate of Substantial Completion for entire work is fully executed, and all other close-out requirements per General Conditions Article 34 are completed.	Name & Title

INVENTORY O	F STORED MAT	ERIALS		DCM Form C-10SM Revised October 2021
Project:			DCM (BC) No.:	
			PSCA No, if any:	
Contractor Company:			For Estimate No.:	
			For Period Ending:	
Α	В	С	D	E
Description	Materials Stored	Materials	Materials Used This	Materials
	Last Period	Purchased This	Period	Presently Stored
		Period	(period noted above)	$(\mathbf{B} + \mathbf{C} - \mathbf{D})$
		(period noted above)		

TOTALS:				
Instructions : • This Form C-10SM must be submitted as nart of the navment and	ication documentation whe	n a Materials Presently St	ored amount of anything o	reater
then \$0 is noted on line 2 of DCM Form C-10. Analization and Cer	retificate for Dayment	in this of the second s	9 Suith fun to macin acto	10000
• Receipts must be provided as attachments to this form C-10SM for	r all amounts placed in Col	umn C: Materials Purchas	ed This Period.	
· The total \$ amount of this Form C-10SM's column E: Materials Pre	esently Stored must match	both Form C-10's line 2: N	Materials Presently Stored, a	pu
Form C-10SOV: Schedule of Values' total \$ amount of Column G:	Materials Presently Stored	Ŧ		
• The \$ amounts in this current Form C-10SM's Column D: Material	ls Used This Period are am	ounts that must all be incl	uded in the current payment	
application's Form C-10SOV's Column E: Work Completed This P . The & amounts in this current Form C-10SM's Column F: Materials	eriod. s Dresently Stored are the s	amounts that must be lister	d in the next navment annlic	ation's
Form C-10SM's Column B: Materials Stored I ast Period	י איוי אים האוטוט לחוואכטון פ	יאיטוו איז ומאווו מאווא מאווטטוווג	שחידע שאחויעם שאחויעם מאחוי	

	SCI	HEDULE	OF VALUE	ES (SOV)				DCM Revise	Form C-10SOV ed October 2021
Projec	ct:					DCM (BC) Proje	ect Number:		
						PSCA Project N	umber, if any:		
Contr	actor Company:					Application Num	ıber:		
						Application Date			
						Period From:		Period To:	
А	В	С	D	Е	F	G	Н	Ι	J
		Schedulad	Work Co	mpleted		Materials	Total Work	c F	Dataing an
		Value	Work		Total Work	Presently Stored	Completed to	Percent of	This column's
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9.					•		-		equal to 20% of
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14. 14.					، ج		۰ ۲		Once H exceeds
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16.					•		۰ ۶		until project is
10.					•		- •		complete,
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20.					• • •		۰ ج		
21.					•		- \$		There will be no
22.					-		- \$		retainage on final
23.					-		- \$		payment
24.					- \$		- \$		application.
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	TOTALS:	•	•	' \$	•	•	۰ \$		•
This p ⁶	ay app SOV's column totals must match amounts in this pay	ζ	;	;		¢	¢	•	
app Fo	rm C-10 per the following indicated Form C-10 line #s:	ن ن	None	None	Ι.	2.	3.	3.	4.
Note: nart of	If this SOV's column G: Materials Presently Stored inc othe maxment annlication documentation	cludes any amoun	ts other than \$0, th	en DCM Form C-	10SM: Inventory	of Stored Material	s with back-up re	ceipts must be	submitted as

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). Four copies of the FPC are required. Each copy of the FPC shall include all attachments including the Contractor's Application for Final Payment.

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

PRO	JECT	:		
			DCM (BC) No	
			PSCA No.	
				If applicable)
YES	N/A	Select "YES" or "N/A" as applicable.		
		Application and Certificate for Final Payment, D application must include original signatures of all par	CM Form C-10: Attach of ties and include all application	one copy to FPC. The tion attachments.
		Certificate of Substantial Completion, DCM For	m C-13: Attach one fully-e	executed copy to FPC.
		Advertisement for Completion, DCM Form C-14 publication (including the advertisement) to the FPC	1: Attach one copy of the :	affidavit of
		Contractor's Affidavit of Payment of Debts & Cla	ims, DCM Form C-18: A	ttach one copy to FPC.
		Contractor's Affidavit of Release of Liens, if req one copy to the FPC.	uired by Owner, DCM F	orm C-19: Attach
		Consent of Surety to Final Payment, if any, To C required for projects with P&P Bonds. Original has be	ontractor, DCM Form C en delivered to Owner. Att	-20: Consent is ach one copy to FPC.
		General Contractor's Roofing Guarantee, DCM Guarantees, if any: Attached to Certificate of Subs	Form C-9, and Other S tantial Completion.	pecified Roofing
		Contractor's One-Year Warranty: Original has be the FPC.	en delivered to the Owner	r. Attach one copy to
		Other Warranties: All other specified original warra one copy to the FPC.	nties has been delivered	to the Owner. Attach
		Record Documents: Specified "As-built" plans and Owner.	specifications have been	delivered to the
		O & M Manuals: Specified instructions and O&M N	lanuals have been deliver	ed to the Owner.
		Time Extension: Over-run of Contract Time has be Change Order Liquidated Damag	en reconciled by: es Attache	d explanation
		Additional Documents or Explanations which ar	e attached:	
Subm	itted B	y:		
		Architectural / Engineering F	irm	
		Signature Printed Nam	e and Title	Date

Final Reconciliation of Fees: Between the final change order execution and the year-end inspection, report the final project cost to <u>https://appengine.egov.com/apps/al/dcm-fees</u> (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.

SAM	PLE PROGRESS SCHEI	DULE 8	REPORT	Ō	NTRACTOR (Contr	actor may use own	form in lieu of	DATE OF RE	EPORT:		
DCM (I	BC) No.:			For	m C-11):						
PSCA p	projects: PSCA No.:							PROCEED D	ATE:		
PROJE	CT:										
				AR	CHITECT/ENGINEE	R:		PROJECTED	COMPLETION D	ATE:	
	WORK DIVISION	%	AMOUNT								
1.	GENERAL REQUIREMENTS										
2.	SITEWORK										
3.	CONCRETE										
4.	MASONRY										
5.	METALS										
6.	WOOD AND PLASTIC										100%
7. 1	THERMAL AND MOISTURE										
<u> </u>	PROTECTION										%06
8. E	DOORS AND WINDOWS										80%
9. F	■INISHES										70%
10. 5	SPECIALTIES										60%
11. E	EQUIPMENT										50%
12. F											40%
13. 5	SPECIAL CONSTRUCTION										30%
14. (CONVEYING SYSTEMS										20%
15. ľ	MECHANICAL										10%
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TOTAL	ORIG. CONTRACT	100%									
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ACTUA	1 DRAW IN \$1,000									AUg	M F
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LEGEN	D: ANTICIPATED ACTIVITY	ACTI	JAL ACTIVITY	ANTICIPAT	ED CASH FLOW	ACTUAL CASH FI	LOW	SCHEDULED C	IVER 12 MONTHS.	21	.11

CONTRACT CHANGE ORDER

Change Order No	Date	DCM (BC) No	
TO: (<i>Contractor</i>) 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.*):

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.

	CONTRACTING PARTIES
Architectural/Engineering Firm	
Recommended By	Contractor Company
Name & Title	By Name & Title
APPROVAL	Awarding Authority/Owner Entity
ALABAMA STATE DEPARTMENT OF EDUCATION	By
(SDE)	Name & Title
(Required for locally-funded, SDE projects.)	CONSENT OF SURETY (for additive \$ change orders only)
By Date: State Superintendent of Education	Surety Company
	By(Attach current Power of Attorney)
	Name & Title

Review/Signature flow: Architect/Engineer (prepare documents) > Contractor (review and sign) (> Surety for additive \$ change orders only [sign]) > Architect/Engineer (review and sign) > Owner (review and sign) > SDE (review, sign, distribute the fully executed Change Order to all parties and forward a copy to the Alabama Division of Construction Management [DCM]). Note: DCM does not sign fully locally-funded SDE project contract documents.

Real	Property Management CH	IANGE ORDER JUSTIFICATIO
70 Wa	ashington Avenue, Suite 444	Change Order No
ontgo 34) 24	mery, Alabama 36104 42-4082 FAX (334) 242-4182	Date:
	Purpose and instructions on next page.	DCM (BC) No
A)	PROJECT NAME & LOCATION:	OWNER ENTITY NAME & ADDRESS:
	CONTRACTOR COMPANY NAME & ADDRESS:	ARCHITECTURAL / ENGINEERING FIRM NAME & ADDRESS:
B)	DESCRIPTION OF PROPOSED CHANGE(S): ATTA	CH CONTRACTOR'S DETAILED COST PROPOSAL(
C)	AMOUNT: ADD DEDUCT \$ ORIGINAL CONTRACT AMOUNT PREVIOUS C.O.'s	TIME EXTENSION: CALENDAR DAY: THRU CONTRACT AMOUNT PRIOR PROPOSED CHANGE ORDER
	\$ + \$	= \$
E)	JUSTIFICATION OF CHANGE ORDER VS. COMPETITIVE BID.	
)	ARCHITECT / ENGINEER'S EVALUATION OF PROPOSED COST	T:
3)	CHANGE ORDER RECOMMENDED	CHANGE ORDER JUSTIFIED AND APPROVED
	ARCHITECTURAL / ENGINEERING FIRM NAME	LOCAL OWNER ENTITY NAME
	ARCHITECT / ENGINEER'S SIGNATURE	OWNER'S SIGNATURE
	By: OWNER'S PROJECT REPRESENTATIVE'S SIGNATURE	OWNER'S LEGAL COUNSEL'S SIGNATURE

TO: Alabama Department of Finance

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 <u>proposed</u> 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.

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

DCM Form B-12 Revised December 2021

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 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: <u>Fully</u> 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 copy 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.

ROUTING PROCEDURES ON NEXT PAGE

CERTIFICATE OF SUBSTANTIAL COMPLETION

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

DCM (BC) No.

OWNER ENTITY NAME AND ADDRESS:	ARCHITECTURAL / ENGINEERING FIRM NAME AND ADDRESS:
Email to receive executed copy:	Email to receive executed copy:
CONTRACTOR COMPANY NAME AND ADDRESS:	BONDING COMPANY NAME AND ADDRESS:
Email to receive executed copy:	Email to receive executed copy:
PROJECT:	
Substantial Completion has been achieved for the ent	ire Work the following portion of the Work:

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

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

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

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

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

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

CERTIFICATE OF SUBSTANTIAL COMPLETION ROUTING PROCEDURE

Only <u>one</u> (1) originally executed substantial completion form shall be routed for signature. DCM office will 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. <u>Provide Owner</u> with DCM Inspector's name & field office address; territories and addresses are available at www.dcm.alabama.gov/staff.aspx.

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

OWNER: Sign and date document, then mail it to DCM Inspector's <u>field office address</u>; 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

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

SAMPLE FORM OF ADVERTISEMENT FOR COMPLETION

LEGAL NOTICE

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

that			,
(Contractor	r Company Name)		
Contractor, has completed the Contract for (Equipment) (Improvement) of](Construction) (No	$\Box (Renovation)$ <i>time of Project</i>):	(Alteration)
at			
(Insert location d	lata in County or Ci	ty)	
for the State of Alabama and the (County) (Cit Owner(s), and have made request for final settl any claim for labor, materials, or otherwise in on notify	y) of lement of said Co connection with	ontract. All perso this project should	ns having immediately
(Archited	ct / Engineer)		
		(Contractor)

(Business Address)

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

DETAIL OF PROJECT SIGN

N.T.S.

8'-0"



Notes:

- 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 sign for all 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) 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 (Same as appears in the Construction Contract):

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 (Same as appears in the Construction Contract):

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

Seal:

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

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:

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.

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	
10. Change Orders - Documentation - no prior work, unless authorized in writing	
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 inspectio 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@realproperty.alabama.gov. Cancellations of any scheduled inspection must be receiv in writing no later than 48 hours prior to the scheduled inspection. If the inspection is canceled, it v be rescheduled subject to the DCM Inspector's availability. Cancellations received less than 48 hour 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.	on ved will urs ed
 13. Inspection Minimum Requirements The following minimum requirements listed below are provided to aid the contractors and architec determining if a project is ready for a required inspection. <u>Pre-Construction Conference</u>: Required Attendees: Contractor, Owner, Architect, Major Subs Fully-executed construction contract and Notice to Proceed Verification of payment of permit fee 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 Pre-Construction Conference for Storm Shelter: Required Attendees: Contractor, Owner, Architec Structural Engineer, Major Subs, Special Inspections Representative The completed and signed DCM Form C-17: Contractor's Statement of Responsibility for Construction of Tornado Storm Shelter (Hurricane Shelter Where Applicable) along with the required Quality Assurance Plan (QAP) must be submitted to the DCM Inspector at the pre-construction conference. 	et in

13. <u>Pre-Roofing Conference</u> : Required Attendees: Contractor, Owner, Architect, Roofing Sub, Roofing			
Manufacturer's Representative			
 Roofing submittais must be approved by the architect prior to pre-roofing conterence Boofing 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.			
Above Ceiling Inspections: Required Attendees: Contractor, Owner, Architect, MEP Engineers,			
Major Subs			
 All work must be completed except for installation of celling tiles, and/or hard cellings 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			
Life Safety Inspections and Final Inspection: Required Attendees: Contractor, Owner, Architect,			
Engineers, Major Subs, Local Fire Marshal			
Fire alarm certification			
 Kitchen hood life suppression system certification Conoral contractor's 5 year reading guarantee (DCM Form C 0) 			
 General contractor's 3-year rooming guarantee (DCM Form C-9) Roofing manufacturer's warranty 			
Above around and below around 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			
 Boller/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			
Year-End Inspection: Required Attendees: Contractor, Owner, Architect, Engineers and/or Major Subs may be required			
Owner's list of documented warranty items			
 Reconciliation of user fees with DCM shall be completed prior to inspection 			
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	Poutine ich deepun
20.	
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
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
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.	>
 Light gauge metal roof framing and/or wood truss framing to be inspected by the structu engineer. 	ral
 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 a. Contractor's Statement of Responsibility and Quality Assurance Plan – Provide paperwork at Pre-Construction Conference b. Certification of Structural Observations from the Structural Engineer of Record must be attached to the Certificate of Substantial Completion form. 	oe -
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 a. Warranties b. Operating and Maintenance Manuals c. As-built Drawings d. Other requirements 	
 67. Advertisement of Completion - start ad after substantial completion a. for projects less than \$50,000.00, Owner advertises 1 week b. for projects \$50,000.00 or more, Contractor advertises for 4 consecutive weeks 	
68. Time Extensions	
69. Final Payment Application checklist	



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

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

NAME OF		NAME OF PUBLIC OFFICIAL/	STATE DEPARTMENT/
FAMILY MEMBER	ADDRESS	PUBLIC EMPLOYEE	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 re	quires the disclosure statement to be co	moleted and filed with all proposals, bids,

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.

SECTION 01 10 00

SUMMARY

PART 1 GENERAL

1.01 PROJECT

- A. Project Name: Elmore Health Science Restoom Renovation.
- B. Owner's Name: Alabama A & M University.
- C. Architect's Name: Nola | VanPeursem Architects, PC.
- D. The Project consists of the renovation of restrooms at Elmore Health Science Building located at Alabama A&M University, Normal, Alabama.

1.02 CONTRACT DESCRIPTION

 A. Contract Type: A single prime contract based on a Stipulated Price as described in Construction Contract - DCM Form C-5 dated August 2021 located in Section 00 50 00 - Construction Documents and Forms.

1.03 PRE-BID CONFERENCE

A. A pre-bid conference shall be held at Alabama A&M University Facilities Building on To Be Determined, 2022 at 2:00 P.M. CDT. Attendance is highly recommended for all General Contractors intending to submit a proposal and Major Subcontractors.

1.04 AID TO CONSTRUCTION

A. Obtain from Utility Company any additional charges for service of type, size and location called for. Include charges in bid to be paid by Contractor to appropriate party. Provide payment of these charges so as to allow logical progression of construction and avoid delay of completion.

1.05 OWNER OCCUPANCY

A. The Owner intends to occupy the Project by the date stated in the Agreement as the contract completion date.

1.06 CONTRACTOR USE OF SITE AND PREMISES

- A. Arrange use of site and premises to allow:
 - 1. Owner occupancy.
 - 2. Work by Others.
 - 3. Work by Owner.
- B. Provide access to and from site as required by law and by Owner:
- C. Confine operations at site to area permitted by Owner.
- D. Do not unreasonable encumber site with materials or equipment.
- E. Assume full responsibility for protecting and safe-keeping of products stored on premises.

1.07 WORK SEQUENCE

A. Coordinate construction schedule and operations with Owner.

1.08 TIME

A. It is anticipated that the successful bidder will be issued a notice of award within forty (40) days of the bid date. Substantial completion must be achieved no later than Ninety (90) calender days after the Notice to Proceed is issued. Refer to Supplementary Conditions of the Contract located in Section 00 50 00 for contract requirements relating to liquidated damages and time extensions.

1.09 PROJECT SUPERVISION

A. The Contractor shall employ a competent supervisor and necessary assistants who shall be in attendance at the project site at all times during performance of the work. The project supervisor shall not be moved to another project or otherwise fail to be in attendance at the project site until the project is substantially complete or until the Architect and Owner approve of the supervisor's absence from the project site.

1.10 SMOKING AND USE OF RADIOS

- A. Owner does not allow smoking, tobacco, fire arms, or drugs on the job site.
- B. General Contractor and Subcontractors personnel shall not have a radio on job-site, shall wear shirts at all times on-site, shall not use foul language in the presence of students or school personnel. Persons violating any of these conditions shall be removed from the job site immediately by the Project Supervisor, warned by their respective employer, and if found violating any condition afterward shall be removed from the project site permanently without any return for any reason.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Correlation of Contractor submittals based on changes.
- E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

- A. Section 00 50 00 Construction Documents and Forms: Agreement: Contract Sum, retainages, payment period, monetary values of unit prices.
- B. Section 00 50 00 Construction Documents and Forms: General Conditions of the Contract and Document 00 50 00 Supplementary Conditions: Additional requirements for progress payments, final payment, changes in the Work.
- C. Document 00 50 00 Supplementary Conditions: Percentage allowances for Contractor's overhead and profit.
- D. Section 01 21 00 Allowances: Payment procedures relating to allowances.

1.03 SCHEDULE OF VALUES

- A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- B. Forms filled out by hand will not be accepted.
- C. Submit a printed schedule on DCM Form C-10, October 2021, Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.
- D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.
- E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization and bonds and insurance.
- F. Include in each line item, the amount of Allowances specified in this section.
- G. Include within each line item, a direct proportional amount of Contractor's overhead and profit.
- H. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: 26th day through the 25th day of the next month.

01 20 00 - 2 PRICE AND PAYMENT PROCEDURES

- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. Present required information in typewritten form.
- E. Form: DCM Form C-10, October 2021, Application and Certification for Payment. Utilize Schedule of Values for listing items in Application and Certificate for Payment.
- F. For each item, provide a column for listing each of the following:
 - 1. Item Number.
 - 2. Description of work.
 - 3. Scheduled Values.
 - 4. Previous Applications.
 - 5. Work in Place and Stored Materials under this Application.
 - 6. Authorized Change Orders.
 - 7. Total Completed and Stored to Date of Application.
 - 8. Percentage of Completion.
 - 9. Balance to Finish.
 - 10. Retainage.
- G. Execute certification by signature of authorized officer.
- H. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- I. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.
- J. Submit six copies of each Application for Payment.
- K. Include the following with the application:
 - 1. Transmittal letter as specified for Submittals in Section 01 30 00.
 - Construction progress schedule, revised and current as specified in Section 01 30 00.
 - 3. Affidavits attesting to off-site stored products.
- L. When Architect requires substantiating information, submit data justifying dollar amounts in question.

1.05 MODIFICATION PROCEDURES

- A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to the Contract Documents.
- B. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.
- C. The Architect/Engineer will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract.
- D. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
 - 1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.

01 20 00 - 3 PRICE AND PAYMENT PROCEDURES

- 2. Promptly execute the change.
- E. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 10 days.
- F. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 6000.
- G. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
 - 1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
 - 2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
 - 3. For pre-determined unit prices and quantities, the amount will based on the fixed unit prices.
- H. Substantiation of Costs: Provide full information required for evaluation.
 - 1. On request, provide following data:
 - a. Quantities of products, labor, and equipment.
 - b. Taxes, insurance, and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
 - 2. Support each claim for additional costs with additional information:
 - a. Origin and date of claim.
 - b. Dates and times work was performed, and by whom.
 - c. Time records and wage rates paid.
 - d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
 - 3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- I. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- J. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- K. Promptly revise progress schedules to reflect any change in Contract Time, revise subschedules to adjust times for other items of work affected by the change, and resubmit.
- L. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

01 20 00 - 4 PRICE AND PAYMENT PROCEDURES

B. Application for Final Payment will not be considered until the following have been accomplished:
1. All closeout procedures specified in Section 01 70 00.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 21 00

ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cash allowances.
- B. Payment and modification procedures relating to allowances

1.02 RELATED REQUIREMENTS

A. Section 01 20 00 - Price and Payment Procedures: Additional payment and modification procedures.

1.03 CASH ALLOWANCES

- A. Costs Included in Cash Allowances: Cost of Product to Contractor or Subcontractor, less applicable trade discounts, delivery to site and applicable taxes. All profit and overhead shall be included in the base bid and shall not be added to items covered by allowance.
- B. Costs Not Included in Cash Allowances: Product delivery to site and handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage; and labor for installation and finishing; and overhead and profit.
- C. Architect Responsibilities:
 - 1. Consult with Contractor for consideration and selection of products, suppliers, and installers.
 - 2. Select products in consultation with Owner and transmit decision to Contractor.
 - 3. Prepare Change Order.
- D. Contractor Responsibilities:
 - 1. Assist Architect in selection of products , and installers.
 - 2. Obtain proposals from suppliers and installers and offer recommendations.
 - 3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
 - 4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
 - 5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.
- E. Differences in costs will be adjusted by Change Order. At the Owner's discretion all or a portion of allowance may be reallocated for miscellaneous changes. Profit and overhead shall be excluded from the cost of changes applied to allowances.
- F. All changes covered by Allowance will be approved by the Owner in writing.
- G. At closeout of Contract, funds remaining in Allowances will be credited to Owner by Change Order, plus a minium of 5 percent for profit and overhead.

1.04 ALLOWANCES SCHEDULE

A. Include the stipulated sum of \$30,000.00 for Owner's discretionary use.

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PART 2 PRODUCTS - NOT USED PART 3 EXECUTION - NOT USED

END OF SECTION

01 21 00 - 2 ALLOWANCES Alabama A&M University Elmore Health Science Restroom Renovation Project No. 21224

01 30 00 - 1 ADMINISTRATIVE REQUIREMENTS

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Communication.
- B. Preconstruction meeting.
- C. Site mobilization meeting.
- D. Progress meetings.
- E. Construction progress schedule.
- F. Coordination drawings.
- G. Submittals for review, information, and project closeout.
- H. Number of copies of submittals.
- I. Submittal procedures.

1.02 COMMUNICATION

A. Electronic mail (e-mail) is required for communications.

1.03 PROJECT COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify utility requirements and characteristics of operating equipment are compatible with building utilites. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.
- C. Coordinate space requirements and installation of mechanical and electgrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and clean uup of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy.
- F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

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01 30 00 - 2 ADMINISTRATIVE REQUIREMENTS

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

- A. Architect will schedule a meeting after Notice of Award.
- B. Attendance Required:
 - 1. Owner.
 - 2. Architect.
 - 3. Contractor.
 - 4. Major Subcontractors or Suppliers.
- C. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Designation of personnel representing the parties in Contract, major subcontractors, and the Architect.
 - 5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 6. Scheduling.
- D. Record minutes and distribute copies within two days after meeting to participants, with one copy to Architect, Owner, participants, and those affected by decisions made.

3.02 SITE MOBILIZATION MEETING

- A. Topics covered under this section will be addressed at the above mentioned Preconstruction Meeting.
- B. Architect will schedule a meeting at the Project site prior to Contractor occupancy.
- C. Attendance Required:
 - 1. Contractor.
 - 2. Owner.
 - 3. Architect.
 - 4. Special Consultants.
 - 5. Contractor's Superintendent.
 - 6. Major Subcontractors.
- D. Agenda:
 - 1. Use of premises by Owner and Contractor.
 - 2. Owner's requirements and occupancy prior to completion.
 - 3. Temporary utilities provided by Owner.
 - 4. Security and housekeeping procedures.
 - 5. Schedules.
 - 6. Application for payment procedures.
 - 7. Procedures for testing.
 - 8. Procedures for maintaining record documents.
 - 9. Requirements for start-up of equipment.
 - 10. Inspection and acceptance of equipment put into service during construction period.
- E. Record minutes and distribute copies within two days after meeting to participants, with one copy to Architect, Owner, participants, and those affected by decisions made.

01 30 00 - 3 ADMINISTRATIVE REQUIREMENTS

3.03 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum maximum two week intervals during initial phase of construction and at one week intervals upon commencement of application of finish materials.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting.

D. Agenda:

- 1. Review minutes of previous meetings.
- 2. Review of Work progress.
- 3. Field observations, problems, and decisions.
- 4. Identification of problems that impede, or will impede, planned progress.
- 5. Review of submittals schedule and status of submittals.
- 6. Review of off-site fabrication and delivery schedules.
- 7. Maintenance of progress schedule.
- 8. Corrective measures to regain projected schedules.
- 9. Planned progress during succeeding work period.
- 10. Coordination of projected progress.
- 11. Maintenance of quality and work standards.
- 12. Effect of proposed changes on progress schedule and coordination.
- 13. Other business relating to Work.
- E. Record minutes and distribute copies within two days after meeting to participants, with one copy to Architect, Owner, participants, and those affected by decisions made.

3.04 CONSTRUCTION PROGRESS SCHEDULE - SEE SECTION 01 32 16

- A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with general outline for remainder of Work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 1. Include written certification that mechanical and electrical contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule every 30 days.

3.05 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

01 30 00 - 4 ADMINISTRATIVE REQUIREMENTS

- C. Samples will be reviewed only for aesthetic, color, or finish selection.
- After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.06 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. Certificates.
 - 3. Test reports.
 - 4. Inspection reports.
 - 5. Manufacturer's instructions.
 - 6. Manufacturer's field reports.
 - 7. Other types indicated.
- B. Submit for the Architect's knowledge as contract administrator or for the Owner.

3.07 SUBMITTALS FOR PROJECT CLOSEOUT

- A. When the following are specified in individual sections, submit them at project closeout:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.
 - 4. Bonds.
 - 5. Other types as indicated.
- B. Submit for Owner's benefit during and after project completion.

3.08 NUMBER OF COPIES OF SUBMITTALS

- A. Documents for Review:
 - 1. Small Size Sheets, Not Larger Than 8-1/2 x 11 inches: Submit the number of copies that Contractor requires, plus two that will be retained by Architect.
 - 2. Larger Sheets, Not Larger Than 30 x 42 inches: Submit the number of opaque reproductions that Contractor requires, plus two copies that will be retained by Architect.
- B. Documents for Information: Submit two copies.
- C. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.
- D. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
 - 1. After review, produce duplicates.
 - 2. Retained samples will not be returned to Contractor unless specifically so stated.

3.09 SUBMITTAL PROCEDURES

- A. Shop Drawing Procedures:
 - 1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
 - 2. Generic, non-project specific information submitted as shop drawings do not meet the requirements for shop drawings.
- B. Transmit each submittal with a copy of approved submittal form.

01 30 00 - 5 ADMINISTRATIVE REQUIREMENTS

- C. Transmit each submittal with approved form.
- D. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- E. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- F. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of Information is in accordance with the requirements of the Work and Contract Documents.
- G. Deliver submittals to Architect at 301 Jefferson Street, Huntsville, AL 35801.
- H. Schedule submittals to expedite the Project, and coordinate submission of related items.
- I. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
- J. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
- K. Provide space for Contractor and Architect review stamps.
- L. When revised for resubmission, identify all changes made since previous submission.
- M. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- N. Submittals not requested will not be recognized or processed.
- O. Shop Drawings and/or submittals requiring resubmission to the Architect due to noncompliance with the Contract Documents and /or incompleteness shall be thoroughly reviewed by the Contractor prior to delivery to the Architect for review. The Contractor shall ensure the completeness and compliance of the submittal materials. Cost incurred by the Owner for review of submittals after the second submittal is rejected will be the responsibility of the Contractor at the rate of \$150.00 per hour, including travel time.

END OF SECTION
SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preliminary schedule.
- B. Construction progress schedule, bar chart type.

1.02 RELATED SECTIONS

A. Section 01 10 00 - Summary: Work sequence.

1.03 REFERENCES

- A. AGC (CPSM) Construction Planning and Scheduling Manual 2004.
- B. M-H (CPM) CPM in Construction Management Project Management with CPM 2015.

1.04 SUBMITTALS

- A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 30 days of Work with a general outline for remainder of Work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
 - 2. Notify Architect of any material or trade that may be a potential delay.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.
- F. Submit under transmittal letter form specified in Section 01 30 00.

1.05 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.
- B. Contractor's Administrative Personnel: five years minimum experience in using and monitoring CPM schedules on comparable projects.

1.06 SCHEDULE FORMAT

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- B. Diagram Sheet Size: Maximum 24 x 36 inches or width required.
- C. Sheet Size: Multiples of 8-1/2 x 11 inches.

D. Scale and Spacing: To allow for notations and revisions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Identify work of separate stages and other logically grouped activities.
- D. Provide sub-schedules for each stage of Work identified in Section 01 10 00.
- E. Provide sub-schedules to define critical portions of the entire schedule.
- F. Include conferences and meetings in schedule.
- G. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- H. Coordinate content with schedule of values specified in Section 01 20 00.
- I. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

- A. Include a separate bar for each major portion of Work or operation.
- B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE

- A. Participate in joint review and evaluation of schedule with Architect at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Update diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- E. Indicate changes required to maintain Date of Final Completion.
- F. Submit reports required to support recommended changes.

G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

3.06 DISTRIBUTION OF SCHEDULE

- A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. References and standards.
- B. Quality assurance submittals.
- C. Mock-ups.
- D. Control of installation.
- E. Tolerances.
- F. Testing and inspection Testing services.
- G. Manufacturers' field services.

1.02 RELATED REQUIREMENTS

- A. Document 00 72 00 General Conditions: Inspections and approvals required by public authorities.
- B. Section 01 30 00 Administrative Requirements: Submittal procedures.
- C. Section 01 60 00 Product Requirements: Requirements for material and product quality.

1.03 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
 - 1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- C. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- D. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
 - 1. Submit report in duplicate within 30 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

01 40 00 - 2 QUALITY REQUIREMENTS

- E. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
 - 1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
 - 2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

1.04 REFERENCES AND STANDARDS - SEE SECTION 01 42 19

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 TESTING AND INSPECTION AGENCIES

- A. Owner will employ and pay for services of an independent testing agency to perform soil and concrete testing all other testing is by Contractor.
- B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

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

3.02 MOCK-UPS

- A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be a comparison standard for the remaining Work.
- D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

3.03 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

- A. See individual specification sections for testing required.
- B. Testing Agency Duties:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Architect and Contractor of observed irregularities or nonconformance of Work or products.
 - 6. Perform additional tests and inspections required by Architect.
 - 7. Attend preconstruction meetings and progress meetings.
 - 8. Submit reports of all tests/inspections specified.
- C. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
 - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - 3. Provide incidental labor and facilities:

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01 40 00 - 4 QUALITY REQUIREMENTS

- a. To provide access to Work to be tested/inspected.
- b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
- c. To facilitate tests/inspections.
- d. To provide storage and curing of test samples.
- 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
- 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.
- F. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.
- G. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect. Payment for re testing will be charged to the Contractor by deducting testing charges from the Contract Price.

3.05 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
 - 1. Observer subject to approval of Architect.
 - 2. Observer subject to approval of Owner.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not conforming to specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

01 41 00 - 1 REGULATORY REQUIREMENTS

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Regulatory requirements applicable to this project are the following:
 - 1. ADA Standards Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
 - 2. 29 CFR 1910 Occupational Safety and Health Standards current edition.
 - 3. ICC (IFC) International Fire Code; 2015.
 - 4. ICC (IBC) International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
 - 5. ICC (IPC) International Plumbing Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
 - 6. ICC (IMC) International Mechanical Code; 2015.
 - 7. ICC (IFGC) International Fuel Gas Code; 2015.
 - 8. National Electric Code, 2014.
 - 9. NFPA 72 National Fire Alarm and Signaling Code; 2013.
 - 10. All local govering codes and ordinances.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary telecommunications services.
- C. Temporary telephone service.
- D. Temporary sanitary facilities.
- E. Temporary Controls: Barriers, enclosures, and fencing.
- F. Security requirements.
- G. Vehicular access and parking.
- H. Waste removal facilities and services.
- I. Field offices.

1.02 RELATED REQUIREMENTS

A. Section 01 51 00 - Temporary Utilities.

1.03 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Telecommunications services shall include:
 - 1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
 - 2. Internet Connections: Minimum of one; DSL modem or faster.
 - 3. Email: Account/address reserved for project use.

1.04 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Use of existing facilities located at project site is not permitted.
- C. Maintain daily in clean and sanitary condition.
- D. At end of construction, return facilities to same or better condition as originally found.

1.05 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING

A. Construction Material: Contractor's option.

1.07 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner security program.

1.08 VEHICULAR ACCESS AND PARKING

- A. Coordinate access and haul routes with governing authorities and Owner.
- B. Provide and maintain access to fire hydrants, free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering streets.
- D. Existing on-site roads may be used for construction traffic.
- E. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.
- F. Do not allow vehicle parking on existing pavement.

1.09 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.10 FIELD OFFICES- SEE SECTION 01 5213

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture. Contractor may designate area of existing structure as a field office.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

1.11 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition.

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01 50 00 - 3 TEMPORARY FACILITIES AND CONTROLS

PART 2 PRODUCTS - NOT USED PART 3 EXECUTION - NOT USED

SECTION 01 51 00

TEMPORARY UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Utilities: Electricity, lighting, heat, ventilation, and water.

1.02 RELATED REQUIREMENTS

A. Section 01 5000 - Temporary Facilities and Controls: Telephone service for administrative purposes.

1.03 TEMPORARY ELECTRICITY

- A. Cost: By Owner.
- B. Connect to Owner's existing power service.
 - 1. Exercise measures to conserve energy.
- C. Provide power outlets for construction operations, with branch wiring and distribution boxes located at each floor. Provide flexible power cords as required.
- D. Provide main service disconnect and over-current protection at convenient location and meter.
- E. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

1.04 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft .
- B. Provide and maintain 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.
- C. Provide and maintain 0.25 watt/sq ft H.I.D. lighting to interior work areas after dark for security purposes.
- D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- E. Maintain lighting and provide routine repairs.
- F. Permanent building lighting may be utilized during construction.

1.05 TEMPORARY HEATING

- A. Cost of Energy: By Owner.
- B. Provide heating devices and heat as needed to maintain specified conditions for construction operations.
- C. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.
- D. Owner's existing heat plant may be used.

01 51 00 - 2 TEMPORARY UTILITIES

- 1. Exercise measures to conserve energy.
- 2. Enclose building prior to activating temporary heat.
- E. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.06 TEMPORARY COOLING

- A. Cost of Energy: By Owner.
- B. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.
- C. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.
- D. Owner's existing cooling plant may be used.
 - 1. Exercise measures to conserve energy.
 - 2. Enclose building prior to activating temporary cooling.
- E. Prior to operation of permanent equipment for temporary cooling purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.07 TEMPORARY VENTILATION

A. Utilize ventilation equipment as required to maintain clean air for construction operations.

1.08 TEMPORARY WATER SERVICE

- A. Cost of Water Used: By Owner.
- B. Provide and maintain suitable quality water service for construction operations at time of project mobilization.
- C. Connect to existing water source.
 - 1. Exercise measures to conserve water.
- D. Extend branch piping with outlets located so water is available by hoses with threaded connections.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations and procedures.
- F. Procedures for Owner-supplied products.
- G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

- A. Section 00 10 00 Bid Documents and Forms: Instructions to Bidders: Product options and substitution procedures prior to bid date.
- B. Section 01 40 00 Quality Requirements: Product quality monitoring.

1.03 REFERENCE STANDARDS

- A. NEMA MG 1 Motors and Generators 2018.
- B. NFPA 70 National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
- D. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

01 60 00 - 2 PRODUCT REQUIREMENTS

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.
- B. Reused Products: Reused products include materials and equipment previously used in this or other construction, salvaged and refurbished as specified.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. Where all other criteria are met, Contractor shall give preference to products that:
 - 1. If used on interior, have lower emissions.
 - 2. If wet-applied, have lower VOC content.
- C. Provide interchangeable components of the same manufacture for components being replaced.
- D. Motors: Refer to Division 22, NEMA MG 1 Type. Specific motor type is specified in individual specification sections.
- E. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
- F. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Provide spare parts, maintenance, and extra products of types and in quantities specified in individual specification sections.
- B. Deliver to Project site and place in location as directed by Owner; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

- A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
- B. Architect will consider requests for substitutions only within 15 days after date of Agreement.

01 60 00 - 3 PRODUCT REQUIREMENTS

- C. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.
- D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- E. A request for substitution constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 5. Will reimburse Owner for all costs incurred for review or redesign services associated with approval by Architect or Architect's Consultants.
- F. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

3.02 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.

- F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- H. Comply with manufacturer's warranty conditions, if any.
- I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- J. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- K. Prevent contact with material that may cause corrosion, discoloration, or staining.
- L. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- M. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Pre-installation meetings.
- C. Cutting and patching.
- D. Surveying for laying out the work.
- E. Cleaning and protection.
- F. Starting of systems and equipment.
- G. Demonstration and instruction of Owner personnel.
- H. Closeout procedures, except payment procedures.

1.02 RELATED REQUIREMENTS

- A. Section 01 30 00 Administrative Requirements: Submittals procedures.
- B. Section 01 40 00 Quality Requirements: Testing and inspection procedures.
- C. Section 01 50 00 Temporary Facilities and Controls: Temporary exterior enclosures.
- D. Section 01 78 00 Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.
- E. Section 07 84 00 Firestopping.

1.03 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
 - 6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Alternatives to cutting and patching.
 - f. Effect on work of Owner or separate Contractor.
 - g. Written permission of affected separate Contractor.
 - h. Date and time work will be executed.

1.04 PROJECT CONDITIONS

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere.
- E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 - 1. Minimize amount of bare soil exposed at one time.
 - 2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
 - 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
 - 4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- F. Noise Control: Provide methods, means, and facilities to minimize noise f produced by construction operations.
- G. Pest Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- H. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.05 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements.
- B. Notify affected utility companies and comply with their requirements.
- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

- B. Promptly notify Architect of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Utilize recognized engineering survey practices.
- E. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- F. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 - 2. Grid or axis for structures.
 - 3. Building foundation, column locations, ground floor elevations.
- G. Periodically verify layouts by same means.
- H. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.
 - 5. Repair areas adjacent to cuts to required condition.
 - 6. Repair new work damaged by subsequent work.
 - 7. Remove samples of installed work for testing when requested.
 - 8. Remove and replace defective and non-conforming work.
- C. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.

- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.
- J. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 2. Match color, texture, and appearance.
 - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.
- K. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- L. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.07 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.08 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Prohibit traffic from landscaped areas.
- H. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.09 SYSTEMS STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect and owner seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of final inspection.
- B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at designated location.
- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.
- E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- G. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

3.11 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.
- B. Testing, adjusting, and balancing HVAC systems: See Section 23 05 93.

3.12 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
- B. Use cleaning materials that are nonhazardous.
- C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Replace filters of operating equipment.
- F. Clean debris from roofs, gutters, downspouts, and drainage systems.
- G. Clean site; sweep paved areas, rake clean landscaped surfaces.
- H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.1. Provide copies to Architect.
- B. Accompany Architect on preliminary inspection to determine items to be listed for completion or correction in Contractor's Notice of Substantial Completion.
- C. Notify Architect when work is considered ready for Substantial Completion.
- D. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.
- E. Owner will occupy portions of the building as specified in Section 01 10 00.
- F. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.
- G. Accompany Architect on preliminary final inspection.
- H. Notify Architect when work is considered finally complete.
- I. Complete items of work determined by Architect's final inspection.

3.14 MAINTENANCE SERVICE

- A. Furnish service and maintenance of components indicated in specification sections during the warranty period.
- B. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- D. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the Owner.

Alabama A&M University Elmore Health Science Restroom Renovation Project No. 21224

01 78 00 - 1 CLOSEOUT SUBMITTALS

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

- A. Section 00 72 00 General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 30 00 Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 70 00 Execution and Closeout Requirements: Contract closeout procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- B. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- C. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

Alabama A&M University Elmore Health Science Restroom Renovation Project No. 21224

01 78 00 - 2 CLOSEOUT SUBMITTALS

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish first floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 - 1. Product data, with catalog number, size, composition, and color and texture designations.
 - 2. Information for re-ordering custom manufactured products.

01 78 00 - 3 CLOSEOUT SUBMITTALS

- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- F. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. Include color coded wiring diagrams as installed.
- E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- G. Provide servicing and lubrication schedule, and list of lubricants required.
- H. Include manufacturer's printed operation and maintenance instructions.
- I. Include sequence of operation by controls manufacturer.
- J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Provide control diagrams by controls manufacturer as installed.
- L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

- N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- O. Include test and balancing reports.
- P. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.
- F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- H. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
- I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- J. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
- K. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
 - Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.

01 78 00 - 5 CLOSEOUT SUBMITTALS

- f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
- 3. Part 3: Project documents and certificates, including the following:
 - a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Photocopies of warranties and bonds.
- L. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
- M. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.06 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.
- F. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
- G. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- H. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- I. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

SECTION 02 41 19

MINOR DEMOLITION FOR REMODELING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Removal of designated building equipment and fixtures.
- B. Removal of designated construction.
- C. Disposal of materials.
- D. Identification of utilities.

1.02 RELATED SECTIONS

- A. Section 01 10 00 Summary: Work sequence.
- B. Section 01 50 00 Temporary Facilities and Controls: Temporary enclosures.
- C. Section 01 78 00 Closeout Submittals: Project record documents.

1.03 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate demolition; location and construction of temporary facilities.
- C. Project Record Documents: Accurately record actual locations of capped or abandoned utilities.

1.04 REGULATORY REQUIREMENTS

- A. Conform to applicable code for demolition work, dust control, products requiring electrical disconnection and re-connection.
- B. Obtain required permits from authorities.
- C. Do not close or obstruct egress from any building exit or site exit.
- D. Conform to applicable regulatory procedures when hazardous or contaminated materials are discovered.

1.05 SEQUENCING

A. Sequence work under the provisions of Section 01 10 00.

1.06 SCHEDULING

- A. Schedule work under the provisions of Section 01 32 16.
- B. Schedule work to coincide with new construction.
- C. Describe demolition removal procedures and schedule.

1.07 PROJECT CONDITIONS

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

02 41 19 - 2 MINOR DEMOLITION FOR REMODELING

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

PART 2 PRODUCTS - NOT USED.

PART 3 EXECUTION

3.01 PREPARATION

- A. Erect and maintain weatherproof closures for exterior openings.
- B. Protect existing materials that are not to be demolished.
- C. Prevent movement of structure; provide bracing and shoring.
- D. Notify affected utility companies before starting work and comply with their requirements.
- E. Mark location and termination of utilities.
- F. Provide appropriate temporary signage including signage for exit or building egress.

3.02 DEMOLITION

- A. Disconnect, remove, and identify designated utilities within demolition areas.
- B. Demolish in an orderly and careful manner. Protect existing supporting structural members.
- C. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.
- D. Remove materials as demolition progresses. Upon completion of demolition, leave areas in clean condition.
- E. Remove temporary facilities.

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concealed wood blocking, nailers, and supports.

1.02 REFERENCE STANDARDS

- A. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- B. PS 1 Structural Plywood 2009 (Revised 2019).
- C. PS 20 American Softwood Lumber Standard 2020.
- D. SPIB (GR) Grading Rules 2014.

1.03 QUALITY ASSURANCE

- A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
 - Lumber of other species or grades, or graded by other agencies, is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
 - 2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
- B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19.
- D. Miscellaneous Blocking, Furring, and Nailers:
 - 1. Lumber: S4S, No. 2 or Standard Grade.

2.03 ACCESSORIES

A. Fasteners and Anchors:

06 10 00 - 2 ROUGH CARPENTRY

- 1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
- 2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
- 3. Anchors: Toggle bolt type for anchorage to hollow masonry.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

3.02 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- C. Provide the following specific non-structural framing and blocking:
 - 1. Cabinets and shelf supports.
 - 2. Grab bars.
 - 3. Towel and bath accessories.

3.03 CLEANING

- A. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- B. Prevent sawdust and wood shavings from entering the storm drainage system.

Alabama A&M University Elmore Health Science Restroom Renovation Project No. 21224

SECTION 06 20 00

FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Finish carpentry items.
- B. Hardware and attachment accessories.

1.02 RELATED REQUIREMENTS

A. Section 09 90 00 - Painting and Coating: Painting and finishing of finish carpentry items.

1.03 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).
- B. AWMAC/WI (NAAWS) North American Architectural Woodwork Standards 2021, with Errata.
- 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. NHLA G-101 Rules for the Measurement and Inspection of Hardwood and Cypress 2019.

1.04 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 - 1. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Custom grade.
- B. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.03 SHEET MATERIALS

- A. Plywood for Cabinetry:
 - 1. Douglas Fir of thickness indicated.
 - 2. Use 3/4" White Melamine on cabinet shelves, tops, bottoms and decks (where concealed from view).
 - 3. Use 3/4" Plastic Laminate on cabinet shelves, tops, bottoms and decks (where not concealed from view).
 - 4. Use C-C Grade when completely covered by plastic laminate.
 - 5. All exposed cabinet ends and faces are to be covered with plastic laminate.

2.04 ADHESIVE

A. Adhesive: Type recommended by AWI to suit application .

2.05 FASTENINGS

- A. Fasteners: Of size and type to suit application; mill finish in concealed locations and satin chrome finish in exposed locations.
- B. Concealed Joint Fasteners: Threaded steel.

2.06 ACCESSORIES

- A. Lumber for Shimming, Blocking, and Curbing: Softwood lumber of Southern Yellow Pine or Spruce species.
- B. Primer: Alkyd primer sealer.
- C. Wood Filler: Solvent base, tinted to match surface finish color.

2.07 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

- A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Set and secure materials and components in place, plumb and level.
- C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
- D. Install trim with wall adhesive by gun application and mechanically fastened as required.

3.03 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
- B. Site Finishing: See Section 09 90 00.
- C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.04 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

06 61 50 - 1 SOLID POLYMER FABRICATIONS

SECTION 06 61 50

SOLID POLYMER FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops with sinks.

1.02 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate product description, fabrication information, and compliance with specified performance requirements.
- C. Shop Drawings: Indicate dimensions, component sizes, fabrication details, attachment provisions, and coordination requirements with adjacent work.
- D. Samples: Submit minimum 2 inches by 2 inches samples. Indicate full range of color and pattern variation. Approved samples will be retained as standards for work.
- E. Maintenance Data: Submit manufacturer's care and maintenance data, including repair and cleaning instructions. Include in project closeout documents.

1.03 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications: Approved by manufacturer of solid polymer manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver no components to project site until areas are ready for installation. Store components indoors prior to installation.
- B. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.05 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Provide manufacturer's 10 year warranty against defects in materials. Warranty shall provide material and labor to repair or replace defective materials. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Avonite Surfaces: www.avonitesurfaces.com.
- B. DuPont Corian: www.corian.com.
- C. Formica Corporation: www.formica.com.
- D. Wilsonart, LLC: www.wilsonart.com.
- E. Substitutions: See Section 01 60 00 Product Requirements.

06 61 50 - 2 SOLID POLYMER FABRICATIONS

F. Provide all solid polymer fabrications from a single manufacturer.

2.02 MATERIALS

- A. Solid Polymer Material: Homogeneous filled acrylic meeting ANSI Z124.3 and Z124.6, Type Six, and FS WW-P-541E/GEN (1); not coated, laminated, or of composite construction.
 - 1. Tensile Strength: 5000 psi minimum, per ASTM D 638.
 - 2. Tensile Modulus: 1000000 psi minimum, per ASTM D 638.
 - 3. Flexural Strength: 7000 psi minimum, per ASTM D 790.
 - 4. Flexural Modulus: 1000000 psi minimum, per ASTM D 790.
 - 5. Elongation: 0.3 percent minimum, per ASTM D 638.
 - 6. Hardness: 90-Rockwell "M" scale minimum.
 - 7. Thermal Expansion: 1.95 x 10⁶ inch/inch/F degree maximum, per ASTM D 696.
 - 8. Color Stability: No change, 100 hours minimum, per NEMA LD3-3.10.
 - 9. Wear and Cleanability: Passes ANSI Z124.3.
 - 10. Abrasion Resistance: No loss of pattern, maximum weight loss (1000 cycles) equal to 0.9 g, per NEMA LD3-3.01, ANSI Z124.3
 - 11. Boiling Water Surface Resistance: No change, per NEMA LD3-3.05.
 - 12. High Temperature Resistance: No change, per NEMA LD3-3.06.
 - 13. Impact Resistance:
 - a. Notched Izod: 0.24 foot-pounds minimum, per ASTM D 256, Method A.
 - b. Gardner Ball Drop: 9.0 foot-pounds minimum, per ASTM D 5420.
 - c. 1/4 inch Sheet: 36 inches minimum, 1/2 pound ball, no failure per NEMA LD3-3.03.
 - d. 1/2 inch Sheet: 140 inches minimum, 1/2 pound ball, no failure per NEMA LD3-3.03.
 - e. 3/4 inch Sheet: 200 inches minimum, 1/2 pound ball, no failure per NEMA LD3-3.03.
 - 14. Stain Resistance: Passes ANSI Z124.3.
 - 15. Weatherability: No change, minimum 1000 hours, per ASTM D 1499.
 - 16. Fungi and Bacteria: No attack, per ASTM G 21 and G 22.
 - 17. Specific Gravity: 1.6 minimum.
 - 18. Water Absorption by Weight: Maximum percent, per ASTM D 570.
 - a. 24 hours, 1/4 inch: 0.05.
 - b. 24 hours, 3/4 inch: 0.10.
 - c. Long term, 1/4 inch: 0.50.
 - d. Long term, 3/4 inch: 0.90.
 - 19. Surface Burning Characteristics: 25 flame spread, 30 smoke developed, Class 1, per ASTM E 84.
 - 20. Pittsburgh Protocol: Solids 80 g minimum rating, per "LC50" Test.
 - 21. Toxicity (as used by NY State): Patterns 65 g minimum.
 - 22. Superficial Damage 0.010 Inch Deep: Repairable by sanding and polishing.
- B. Joint Adhesive: Manufacturer's standard two-part adhesive kit to create inconspicuous, nonporous joints, with chemical bond.
- C. Panel Adhesive: Manufacturer's standard neoprene-based panel adhesive meeting ANSI A136.1, UL listed.
- D. Sealant: Manufacturer's standard mildew-resistant, FDA/UL recognized silicone sealant in color-matching or clear formulations.

06 61 50 - 3 SOLID POLYMER FABRICATIONS

2.03 SOLID POLYMER FABRICATIONS

- A. Countertops with Sinks: Solid polymer material complete with sink, backsplash of size shown, and edge details as shown on drawings.
 - 1. Thickness: 1/2 inch.
 - 2. Color: To be selected by Architect from color Group 2.
 - a. Sink Model: 810.
 - b. Color: To be selected by Architect from color Group 2.
 - c. Sink Type: Seamed "S" mount.

2.04 FABRICATION

- A. Fabricate components in shop to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and solid polymer manufacturer requirements.
- B. Form joints between components using manufacturer's standard joint adhesive, joints inconspicuous in appearance and without voids. Attach 2 inch wide reinforcing strip of solid polymer material under each joint.
- C. Rout and finish component edges to a smooth, uniform finish. Rout all cutouts, then sand all edges smooth. Repair or eject defective or inaccurate work.
- D. Finish: Uniform on all surfaces.
 - 1. Matte: Gloss rating of 5-20.
 - 2. Semigloss: Gloss rating of 25-50.
 - 3. Polished: Gloss rating of 55-80.

2.05 SOURCE QUALITY CONTROL

- A. Allowable Tolerances:
 - 1. Variation in Component Size: Plus or minus 1/8 inch.
 - 2. Location of Openings: Plus or minus 1/8 inch from indicated location.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install components plumb and level, in accordance with approved shop drawings and product installation details.
- B. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Keep components and hands clean when making joints.
- C. Keep components and hands clean during installation. Remove adhesives, sealants, and other stains. Components shall be clean on Date of Substantial Completion.
- D. Make plumbing connections to sinks in accordance with Division 22, Plumbing.
- E. Protect surfaces from damage until Date of Substantial Completion. Repair or replace damaged work that cannot be repaired to architect's satisfaction and invoice for the cost of repairs; before repairs are made, cost estimates are subject to architect's approval.
- F. Provide a Commercial Care and Maintenance video, review maintenance procedures and warranty details with the director of maintenance upon completion of project.

07 72 00 - 1 ROOF ACCESSORIES

SECTION 07 72 00

ROOF ACCESSORIES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. Guard Rail System

1.03 PERFORMANCE REQUIREMENTS

A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof accessories. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.
- C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.

1.05 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
 - 1. Size and location of roof accessories specified in this Section.
 - 2. Method of attaching roof accessories to roof or building structure.
 - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
 - 4. Required clearances.
- B. Warranty: Sample of special warranty.

1.06 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.07 COORDINATION

A. Coordinate layout and installation of roof accessories with SBS-Modified Roofing interfacing and adjoining construction to provide a leak-proof, weather-tight, and secure installation.

07 72 00 - 2 ROOF ACCESSORIES

B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

PART 2 PRODUCTS

2.01 METAL MATERIALS

- A. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, AZ50 (AZM150) coated.
 - 1. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil (0.005 mm).
- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
 1. Mill Finish: As manufactured.
- C. Aluminum Extrusions and Tubes: ASTM B 221 (ASTM B 221M), manufacturer's standard alloy and temper for type of use, finished to match assembly where used, otherwise mill finished.
- D. Stainless-Steel Sheet and Shapes: ASTM A 240/A 240M or ASTM A 666, Type 304.

2.02 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
- C. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
- D. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.

2.03 GUARD-RAILS

- A. Guard-Rail System: Contractor is to include in their bid all cost associate with the furnishing and installation of the new guard-rail systems at locations as indicated. Guard-rail systems to have a galvanized finish. Guard-rails surrounding roof hatches shall be provided with a self-closing gate.
 - 1. Manufactures: Approved Equal
 - a. BlueWater Manufacturing.
 - b. Safety Rail Company.
 - c. Garlock Safety Systems.

2.04 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions.
 - 1. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
 - 2. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 - 3. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene sheet.
 - 3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.
- C. Clean exposed surfaces according to manufacturer's written instructions.
- D. Clean off excess sealants.
- E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

SECTION 07 84 00

FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Firestopping systems.
- B. Firestopping of all joints and penetrations in fire-resistance rated and smoke-resistant assemblies , whether indicated on drawings or not , and other openings indicated.

1.02 REFERENCE STANDARDS

- A. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials 2020.
- B. ASTM E814 Standard Test Method for Fire Tests of Penetration Firestop Systems 2013a (Reapproved 2017).
- C. UL (FRD) Fire Resistance Directory Current Edition.

1.03 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics.

1.04 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.

PART 2 PRODUCTS

2.01 FIRESTOPPING SYSTEMS

- A. Firestopping: Any material meeting requirements.
 - 1. Fire Ratings: See Drawings for required systems and ratings.

2.02 MATERIALS

- A. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant; conforming to the following:
 - 1. Manufacturers:
 - a. 3M Fire Protection Products.
 - b. Tremco: www.tremcofirestop.com
 - c. Hilti.
 - d. Substitutions: See Section 01 60 00 Product Requirements.
- B. Fibered Compound Firestopping: Formulated compound mixed with incombustible nonasbestos fibers; conforming to the following:
 - 1. Manufacturers:
 - a. A/D Fire Protection Systems Inc.
 - b. USG Corporation.
 - c. Tremco: www.tremcofirestop.com
 - d. Substitutions: See Section 01 60 00 Product Requirements.

07 84 00 - 2 FIRESTOPPING

- C. Fiber Firestopping: Mineral fiber insulation used in conjunction with elastomeric surface sealer forming airtight bond to opening; conforming to the following:
 - 1. Manufacturers:
 - a. A/D Fire Protection Systems Inc.
 - b. Pecora Corp.
 - c. Tremco: www.tremcofirestop.com
 - d. USG Corporation.
 - e. Substitutions: See Section 01 60 00 Product Requirements.
- D. Firestop Devices Wrap Type: Mechanical device with incombustible filler and sheet stainless steel jacket, intended to be installed after penetrating item has been installed; conforming to the following:
 - 1. Manufacturers:
 - a. 3M Fire Protection Products.
 - b. Tremco: www.tremcofirestop.com
 - c. Substitutions: See Section 01 60 00 Product Requirements.
- E. Intumescent Putty: Compound that expands on exposure to surface heat gain; conforming to the following:
 - 1. Manufacturers:
 - a. 3M Fire Protection Products.
 - b. Tremco: www.tremcofirestop.com
 - c. Substitutions: See Section 01 60 00 Product Requirements.
- F. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- C. Install backing materials to arrest liquid material leakage.

3.03 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authority having jurisdiction.
- C. Install labelling required by code.

3.04 CLEANING

A. Clean adjacent surfaces of firestopping materials.

07 84 00 - 3 FIRESTOPPING

3.05 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

SECTION 07 90 05

JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sealants and joint backing.
- B. Precompressed foam sealers.

1.02 REFERENCE STANDARDS

- A. ASTM C920 Standard Specification for Elastomeric Joint Sealants 2018.
- B. ASTM C1193 Standard Guide for Use of Joint Sealants 2016.
- C. SCAQMD 1168 Adhesive and Sealant Applications 1989 (Amended 2017).

1.03 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating sealant chemical characteristics.

1.04 MOCK-UP

- A. Provide mock-up of sealant joints in conjunction with window under provisions of Section 01 40 00.
- B. Construct mock-up with specified sealant types and with other components noted.
- C. Locate where directed.
- D. Mock-up may remain as part of the Work.

1.05 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.06 WARRANTY

- A. See Section 01 78 00 Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Gunnable and Pourable Sealants:
 - 1. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com/#sle.
 - 2. Bostik Inc: www.bostik-us.com/#sle.
 - 3. Dow Corning Corporation: www.dowcorning.com/#sle.

07 90 05 - 2 JOINT SEALERS

- 4. Tremco Global Sealants: www.tremcosealants.com/#sle.
- 5. Substitutions: See Section 01 60 00 Product Requirements.

2.02 SEALANTS

- A. Sealants and Primers General: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
- B. Type 4 General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
 - 1. 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.
- C. Type 5 Bathtub/Tile Sealant: White silicone; ASTM C920, Uses I, M and A; single component, mildew resistant.
 - 1. Applications: Use for:
 - a. Joints between plumbing fixtures and floor and wall surfaces.
 - b. Joints between kitchen and bath countertops and wall surfaces.

2.03 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667 closed cell PVC; oversized 30 to 50 percent larger than joint width.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.

07 90 05 - 3 JOINT SEALERS

- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- D. Install bond breaker where joint backing is not used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Tool joints concave.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

3.05 PROTECTION

A. Protect sealants until cured.

3.06 SCHEDULE

- A. Interior Joints for Which No Other Sealant is Indicated: Type 4; colors as shown on the drawings.
- B. Joints Between Plumbing Fixtures and Walls and Floors, and Between Countertops and Walls: Type 5.

09 21 16 - 1 GYPSUM BOARD ASSEMBLIES

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal stud wall framing.
- B. Cementitious backing board.
- C. Joint treatment and accessories.

1.02 REFERENCE STANDARDS

- A. ASTM C475/C475M Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board 2017.
- B. ASTM C645 Standard Specification for Nonstructural Steel Framing Members 2018.
- C. ASTM C754 Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2020.
- D. ASTM C840 Standard Specification for Application and Finishing of Gypsum Board 2020.
- E. ASTM C954 Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness 2018.
- F. ASTM C1002 Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs 2020.
- G. ASTM C1288 Standard Specification for Fiber-Cement Interior Substrate Sheets 2017.
- H. GA-216 Application and Finishing of Gypsum Panel Products 2016, with Errata.

1.03 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Test Reports: For all stud framing products that do not comply with ASTM C645 or C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.04 QUALITY ASSURANCE

- A. Perform in accordance iwth GA-214 and GA-216. Comply with requirements of GA-600 for fire-rated assemblies.
- B. Installer Qualifications: Company specializing in performing gypsum board application and finishingwith minimum 5 years of documented experience.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

09 21 16 - 2 GYPSUM BOARD ASSEMBLIES

2.02 BOARD MATERIALS

- A. Manufacturers Gypsum-Based Board:
 - 1. American Gypsum: www.americangypsum.com
 - 2. CertainTeed Corporation: www.certainteed.com
 - 3. Georgia-Pacific Gypsum: www.gpgypsum.com
 - 4. Lafarge North America Inc: www.lafargenorthamerica.com.
 - 5. National Gypsum Company: www.nationalgypsum.com
 - 6. Temple-Inland Building Product by Georgia-Pacific, LLC: www.temple.com.
 - 7. USG Corporation: www.usg.com
- B. Backing Board For Wet Areas: One of the following products:
 - 1. Application: Surfaces behind tile in wet areas including all restroom and kitchen areas..
 - 2. ASTM Cement-Based Board: Non-gypsum-based, cementitious board complying with ASTM C1288.
 - a. Thickness: 1/2 inch.

2.03 ACCESSORIES

- A. Corner Beads: Galvanized steel.
- B. Trim: GA-201 and GA-216; Bead type as detailed.
- C. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
- D. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium-plated for exterior locations.
- E. Screws for Attachment to Steel Members From 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.
- F. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Studs: Space studs as indicated.
 - 1. Extend partition framing to structure where indicated and to ceiling in other locations.
 - 2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
 - 3. Extend stud framing through ceiling to deck above, only where indicated. Provide extended leg ceiling runners.
- C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

09 21 16 - 3 GYPSUM BOARD ASSEMBLIES

- D. Blocking: Install wood blocking for support of:
 - 1. Wall mounted cabinets.
 - 2. Plumbing fixtures.
 - 3. Toilet partitions.
 - 4. Toilet accessories.
 - 5. Wall mounted door hardware.

3.03 BOARD INSTALLATION

- A. Comply with ASTM C 840, GA-216, ASTM C 840, GA-216, ASTM C 840, and GA-216. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Double-Layer Non-Rated: Use gypsum board for first layer, placed perpendicular to framing or furring members, with ends and edges occurring over firm bearing. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.
- D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- E. Installation on Metal Framing: Use screws for attachment of all gypsum board .

3.04 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
 - 2. At exterior soffits, not more than 30 feet apart in both directions.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.05 JOINT TREATMENT

- A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 - 2. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
- B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
 - 2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile.

3.06 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

SECTION 09 30 00

TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

- A. Section 07 90 05 Joint Sealers.
- B. Section 09 21 16 Gypsum Board Assemblies: Tile backer board.

1.03 REFERENCE STANDARDS

- A. ANSI A118.15 American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2013.1.
 - 1. ANSI A137.1 American National Standard Specifications for Ceramic Tile 2021.
 - ASTM C373 Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products 2018.
- B. TCNA (HB) Handbook for Ceramic, Glass, and Stone Tile Installation 2021.

1.04 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Samples: Mount tile and apply grout on two plywood panels, minimum 18 x 18 inches in size illustrating pattern, color variations, and grout joint size variations.

1.05 QUALITY ASSURANCE

A. Maintain one copy of and ANSI A108/A118/A136.1 and TCNA (HB) on site.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

PART 2 PRODUCTS

2.01 TILE

- A. Manufacturers: All products by the same manufacturer, with the exception of the paver tile.All products by the same manufacturer.
 - 1. Anatolia: www.anatoliatile.com

- 2. Floridatile: www.floridatile.com
- 3. Substitutions: See Section 01 60 00 Product Requirements.
- B. Colored-Body Porcelain Wall Tile: ANSI A137.1 standard grade.
 - 1. Moisture Absorption: 0.5 percent as tested in accordance with ASTM C373.
 - 2. Size: 12 by 24 inch, nominal.
 - 3. Edges: Square.
 - 4. Surface Finish: Matte glaze.
 - 5. Color(s): To be selected by Architect from manufacturer's full range.
 - 6. Products:
 - a. Nexus, Glased Porcelain by Anatolia.
 - b. Substitutions: See Section 01 60 00 Product Requirements.
- C. Porcelain Floor Tile: ANSI A137.1 standard grade.
 - 1. Size: 12 by 24 inch, nominal.
 - 2. Thickness: 3/8 inch.
 - 3. Edges: Square.
 - 4. Surface Finish: Matte glazed.
 - 5. Color(s): To be selected by Architect from manufacturer's full range.
 - 6. Products:
 - a. Moditique MTQ10 by FloridaTile.
 - b. Substitutions: See Section 01 60 00 Product Requirements.

2.02 TRIM AND ACCESSORIES

- A. Non-Ceramic Trim: Satin natural anodized extruded aluminum, style and dimensions to suit application, for setting using tile mortar or adhesive.
 - 1. Applications:
 - a. Wall corners, outside: Product Quadec-K as manufactured by Schluder-Systems or approved equal.
 - b. Wall corners, inside and base: Product DILEX-AHKA as manufactured by Schluder-Systems or approved equal.
 - c. Transition between floor finishes of different heights. Deco as manufactured by Schluter-Systems or approved equal.
 - d. Expansion and control joints, floor and wall.
 - 2. Manufacturers:
 - a. Schluter-Systems: www.schluter.com
 - b. Substitutions: See Section 01 60 00 Product Requirements.

2.03 MORTAR MATERIALS

- A. Mortar Bed Materials: Portland cement, sand, latex additive and water.
- B. Mortar Bond Coat Materials:

2.04 GROUTS

- A. Standard Grout: ANSI A118.6 standard cement grout.
 - 1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
 - 2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
 - 3. Color(s): As selected by Architect from manufacturer's full line.
- B. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
 - 1. Composition: Water-based colorless silicone.

2.05 ACCESSORY MATERIALS

- A. Waterproofing and Crack Isolation Membrane to be thin, cold applied, single component liquid and load bearing and UL GREENGUARD Gold compliant. Reinforcing fabric to be non-woven rot-proof specifically intended for waterproofing membrane. Waterproofing Membrane to be non-toxic, non-flammable, and non-hazardous during storage, mixing, application and when cured. It shall be certified by IAPMO and ICC approved as a shower pan liner and shall also meet the following physical requirements:
 - 1. Hydrostatic Test (ASTM D4068): Pass
 - 2. Elongation @ break (ASTM D751): 20-30%
 - 3. System Crack Resistance (ANSI Á118.12): Pass (High)
 - 4. 7 day Tensile Strength (ANSI A118.10): 265 psi (1.8 MPa)
 - 5. 7 day Shear Bond Strength (ANSI A118.10): 200 psi (1.4 MPa)
 - 6. 28 Day Shear Bond Strength (ANSI A118.4): 214 psi (1.48 2.4 MPa)
 - 7. Service Rating (TCNA/ASTM C627): Extra Heavy
 - 8. Products:
 - a. Laticrete International, Inc.; Hydo Ban: www.laticrete.com
 - b. H.B. Fuller Construction Products Inc.; ProSpec B-6000; www.prospec.com
 - c. Substitutions: See Section 01 60 00 Product Requirements.
- B. Cleavage Membrane Under Thick Mortar Bed:
 - 1. Products:
 - a. DITRA by Schuter.
 - b. Substitutions: See Section 01 60 00 Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.

3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

3.03 INSTALLATION - GENERAL

- A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1a thru A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Place thresholds at exposed tile edges.
- D. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- E. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

- F. Form internal angles square and external angles bullnosed.
- G. Install non-ceramic trim in accordance with manufacturer's instructions.
- H. Sound tile after setting. Replace hollow sounding units.
- I. Keep control and expansion joints free of mortar, grout, and adhesive.
- J. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
- K. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- L. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.
- M. At changes in plane and tite-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.
- N. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.04 INSTALLATION - FLOORS - MORTAR BED METHODS

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F111, with cleavage membrane, unless otherwise indicated.
- B. Cleavage Membrane: Lap edges and ends.
- C. Waterproofing Membrane: Install as recommended by manufacturer and as specified in the section in which the product is specified.
- D. Mortar Bed Thickness: 2 inch, unless otherwise indicated. Continuous slope to drain,

3.05 INSTALLATION - WALL TILE

- A. Over cementitious backer units install in accordance with TCNA (HB) Method W223, organic adhesive.
- B. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202, thin-set with dry-set or latex-Portland cement bond coat.

3.06 CLEANING

A. Clean tile and grout surfaces.

3.07 PROTECTION

- A. Do not permit traffic over finished floor surface for 4 days after installation.
- B. Protect floor as required with material suitable to withstand construction traffic. Maintain and replace protective covering as required during construction.

09 51 00 - 1 ACOUSTICAL CEILINGS

SECTION 09 51 00

ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.
- C. Supplementary acoustical insulation above ceiling.

1.02 REFERENCE STANDARDS

- A. ASTM C635/C635M Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings 2017.
- B. ASTM C636/C636M Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels 2019.
- C. ASTM E580/E580M Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions 2020.
- D. CAL (CHPS LEM) Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- E. GEI (SCH) GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Do not install acoustical units until after interior wet work is dry.

1.04 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on suspension system components.
- C. Samples: Submit two full size samples illustrating material and finish of acoustical units.
- D. Samples: Submit two samples each, 12 inches long, of suspension system main runner.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 Product Requirements, for additional provisions.

2. Extra Acoustical Units: One box of each type of acoustical ceiling tile.

1.05 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

- A. Manufacturers:
 - 1. Armstrong World Industries, Inc: www.armstrong.com.
 - 2. CertainTeed Corporation: www.certainteed.com.
 - 3. Chicago Metallic: www.chicagometallic.com.
 - 4. USG: www.usg.com.
 - 5. Substitutions: See Section 01 60 00 Product Requirements.
- B. Acoustical Panels : Vinyl faced gypsum, with the following characteristics:
 - 1. VOC Content: Certified as Low Emission by one of the following :
 - a. GreenGuard Children and Schools; www.greenguard.org.
 - b. Product listing in the CHPS Low-Emitting Materials Product List at; www.chps.net/manual/lem_table.htm.
 - 2. Size: 24 x 24 inches.
 - 3. Thickness: 1/2 or 5/8 inches.
 - 4. Edge: Square.
 - 5. Surface Color: White.
 - 6. Surface Pattern: lightly textured.
 - 7. Suspension System: Exposed grid Type 1.

2.02 SUSPENSION SYSTEM(S)

- A. Manufacturers:
 - 1. Same as for acoustical units.
 - 2. Substitutions: See Section 01 60 00 Product Requirements.
- B. Suspension Systems General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
- C. Exposed Steel Suspension System Type 1: Formed steel, commercial quality cold rolled; heavy-duty.
 - 1. Profile: Tee; 15/16 inch wide face.
 - 2. Construction: Double web.
 - 3. Finish: White painted.

09 51 00 - 3 ACOUSTICAL CEILINGS

2.03 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Perimeter Moldings: Same material and finish as grid.
 - 1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.
- C. Edge Trim: Armstron Axion 2-inch Classic Trim or equal. See drawings for location.
- D. Acoustical Insulation: Specified in Section 07 21 00.
 1. Size: To fit acoustical suspension system.
- E. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, ASTM C636/C636M, ASTM E580/E580M, ASTM C636/C636M, and ASTM E580/E580M and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:240.
- C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- I. Do not eccentrically load system or induce rotation of runners.
- J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Use longest practical lengths.
 - 2. Miter corners.

09 51 00 - 4 ACOUSTICAL CEILINGS

3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Lay directional patterned units with pattern parallel to longest room axis.
- D. Fit border trim neatly against abutting surfaces.
- E. Install units after above-ceiling work is complete.
- F. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- G. Cutting Acoustical Units:
 - 1. Cut to fit irregular grid and perimeter edge trim.
 - 2. Make field cut edges of same profile as factory edges.
- H. Where round obstructions occur, provide preformed closures to match perimeter molding.
- I. Lay acoustical insulation for a distance of 48 inches either side of acoustical partitions as indicated.
- J. Install hold-down clips on panels within 20 ft of an exterior door.

3.04 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

SECTION 09 90 00

PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factoryfinished and unless otherwise indicated, including the following:
 - 1. Exposed surfaces of steel lintels and ledge angles.
 - 2. Interior walls and bottom of fountains.
 - 3. Mechanical and Electrical:
 - a. Refer to Mechanical and Electrical specifications for schedule of color coding of equipment, ductwork, piping, and conduit.
 - b. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
 - c. In finished areas, paint shop-primed items.
 - d. Paint all exposed mechanical, plumbing, or electrical accessories on sloped roof areas, including that which is factory-finished.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Floors, unless specifically so indicated.
 - 6. Ceramic and other tiles.
 - 7. Brick, architectural concrete, cast stone, integrally colored plaster and stucco.
 - 8. Exterior insulation and finish system (EIFS).
 - 9. Glass.
 - 10. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Shop-primed items.

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency current edition.
- B. ASTM D4442 Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials 2020.

1.04 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on all finishing products, including VOC content.

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C. Samples: Submit two paper chip samples, 8-1/2 x 11 inch in size illustrating range of colors and textures available for each surface finishing product scheduled.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 5 years experience.

1.06 MOCK-UP

- A. See Section 01 40 00 Quality Requirements, for general requirements for mock-up.
- B. Provide door and frame assembly illustrating paint coating color, texture, and finish.
- C. Locate where directed.
- D. Mock-up may remain as part of the work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
- B. Paints:
 - 1. Glidden Professional, a product of PPG Architectural Coatings: www.gliddenprofessional.com.

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- 2. Benjamin Moore & Co: www.benjaminmoore.com
- 3. PPG Architectural Finishes, Inc: www.ppgaf.com
- 4. Sherwin-Williams Company: www.sherwin-williams.com
- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: See Section 01 60 00 Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

- A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
 - 1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Supply each coating material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
- B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
 - 1. Primers maybe tinted to 50 percent of finish color.
- C. Volatile Organic Compound (VOC) Content:
 - 1. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- D. Chemical Content: The following compounds are prohibited:
 - 1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
 - 2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.

2.03 PAINT SYSTEMS - INTERIOR

- A. Paint CI-OP-3E Concrete/Masonry, Epoxy Enamel, 3 Coat:
 - 1. One coat of catalyzed epoxy primer.
 - 2. Gloss: Two coats of catalyzed epoxy enamel.
- B. Paint MI-OP-3L Ferrous Metals, Unprimed, Latex, 3 Coat:
 - 1. One coat of latex primer.
 - 2. Semi-gloss: Two coats of latex enamel.
- C. Paint MI-OP-2L Ferrous Metals, Primed, Latex, 2 Coat:
 - 1. Touch-up with latex primer.
 - 2. Semi-gloss: Two coats of latex enamel.

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2.04 ACCESSORY MATERIALS

- A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.
- D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Gypsum Wallboard: 12 percent.
 - 2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
 - 3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
 - 4. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to coating application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or repair existing coatings that exhibit surface defects.
- D. Remove surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- G. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- H. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

09 90 00 - 5 PAINTING AND COATING

- B. Apply products in accordance with manufacturer's instructions.
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance.
- E. Sand wood and metal surfaces lightly between coats to achieve required finish.
- F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
- H. Label all fire and smoke walls in accordance with applicable Building Codes.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.

3.05 SCHEDULE - PAINT SYSTEMS

- A. Concrete, Concrete Block: Finish all surfaces exposed to view.1. Interior: Wet areas, CI-OP-3E.
- B. Steel Doors and Frames: Finish all surfaces exposed to view; MI-OP-2L, gloss.
- C. Steel Fabrications: Finish all surfaces exposed to view. 1. Interior: MI-OP-3L, gloss.

10 21 13.19 - 1 PLASTIC TOILET COMPARTMENTS

SECTION 10 21 13.19

PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid plastic toilet compartments.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 Rough Carpentry: Blocking and supports.
- B. Section 10 28 00 TOILET ACCESSORIES.

1.03 REFERENCE STANDARDS

- A. ASTM A666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.
- B. National Fire Protection Association (NFPA) 286 Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Roof Fire Growth.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- C. Product Data: Provide data on panel construction, hardware, and accessories, including documentation that all HDPE passes NFPA 286.
- D. Samples: Submit two samples of partition panels, 3 x 3 inch in size illustrating panel finish, color, and sheen.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Solid Plastic Toilet Compartments:
 - 1. Partition Systems International of South Carolina: www.psisc.com.
 - 2. Scranton Products (Santana/Comtec/Capital); Solid HDPE Bathroom Paritions: www.scrantonproducts.com.
 - 3. General Partitions: www.generalpartitions.com.
 - 4. Substitutions: Section 01 60 00 Product Requirements.

2.02 SOLID PLASTIC TOILET COMPARTMENTS

A. Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE), floor-mounted headrail-braced.

10 21 13.19 - 2 PLASTIC TOILET COMPARTMENTS

- 1. Fire hazard classification: Pass NFPA 286.
- 2. Color: Single color to be selected by Architect from Manufacturers full range of colors.
- B. Doors:
 - 1. Thickness: 1 inch.
 - 2. Width: 24 inch.
 - 3. Width for Handicapped Use: 36 inch, out-swinging.
 - 4. Height: 58 inch.
- C. Panels:
 - 1. Thickness: 1 inch.
 - 2. Height: 58 inch.
 - 3. Depth: As indicated on drawings.
- D. Pilasters:
 - 1. Thickness: 1 inch.
 - 2. Width: As required to fit space; minimum 3 inch.

2.03 ACCESSORIES

- A. Pilaster Shoes: Formed chromed steel with satin finish, 3 in high, concealing floor fastenings.
 - 1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.
- B. Head Rails: Hollow anodized aluminum, 1 x 1-1/2 inch size, with anti-grip profile and cast socket wall brackets.
- C. Pilaster Brackets: Continuous type, Satin stainless steel.
- D. Wall Brackets: Continuous type, satin stainless steel.
- E. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
 - 1. For attaching panels and pilasters to brackets: Through-bolts and nuts ; tamper proof.
- F. Hardware: Satin stainless steel:
 - 1. Hinges: Aluminum 54-inch Gravity Close Hinge.
 - 2. Door Latch: Slide type with exterior emergency access feature.
 - 3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
 - 4. Coat hook with rubber bumper; one per compartment, mounted on door.
 - 5. Provide door pull for outswinging doors.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

10 21 13.19 - 3 PLASTIC TOILET COMPARTMENTS

- B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

3.03 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return outswinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

10 28 00 - 1 TOILET ACCESSORIES

SECTION 10 28 00

TOILET ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Accessories for toilet rooms.
- B. Grab bars.
- C. Electric hand dryers.

1.02 REFERENCE STANDARDS

- A. ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2015.
- B. ASTM A269/A269M Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service 2015a (Reapproved 2019).
- C. ASTM A666 Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2015.

1.03 SUBMITTALS

- A. See Section 01 30 00 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.
- C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

1.04 COORDINATION

A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Toilet Accessories:
 - 1. American Specialties, Inc.
 - 2. Bobrick Washroom Equipment, Inc.
 - 3. Bradley Corporation.
 - 4. Substitutions: Section 01 60 00 Product Requirements.
- B. All items of each type to be made by the same manufacturer.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.

10 28 00 - 2 TOILET ACCESSORIES

- B. Keys: Provide two keys for each accessory to Owner ; master key all lockable accessories.
- C. Stainless Steel Sheet: ASTM A666, Type 304.
- D. Stainless Steel Tubing: ASTM A269, Type 304 or 316.
- E. Adhesive: Two component epoxy type, waterproof.
- F. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type.

2.03 FINISHES

- A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.
- B. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.

2.04 TOILET ROOM ACCESSORIES

- A. Toilet Paper Dispenser: Furnished by Owner, installed by General Contractor at locations designated on drawings.
- B. Soap Dispenser: Furnished by Owner, installed by General Contractor at locations designated on drawings.
- C. Mirrors: Stainless steel framed, 6 mm thick float glass mirror.
 - 1. Size: 24 inches x 36 inches, 18 inches by 36 inches, and 18 inches by 60 inches as shown on the drawings.
 - 2. Frame: 0.05 inch angle shapes, with mitered corners, and tamperproof hanging system; No.4 finish.
 - 3. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
 - 4. Product: Model 780 manufactured by Bradley Corp. or approved equal.
- D. Grab Bars: Stainless steel, 1-1/2 inches outside diameter, minimum 0.05 inch wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
 - 1. Length and configuration: As indicated on drawings.
 - 2. Product: 800 Series manufactured by Bradley Corp. or approved equal.
- E. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
 - 1. Overall size: 8 inches wide by 11-1/2 inches high by 4-1/8 inches deep.
 - 2. Product: Model 4781-11 manufactured by Bradley Corp. or approved equal.
- F. Electric Hand Dryers: Refer to Electrical Drawings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. Verify that field measurements are as indicated on drawings.

10 28 00 - 3 TOILET ACCESSORIES

3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings

SECTION 22 05 00

PLUMBING GENERAL PROVISIONS

PART 1 GENERAL

1.01 DESCRIPTION

- A. The other Contract Documents complement the requirements of this Section. The General Requirements apply to the work of this Section.
- B. The word "Contractor" used within this Specification Division shall apply to the Mechanical or Plumbing Contractor.

1.02 SCOPE OF WORK

- A. The Work shall include the furnishings of systems, equipment, and materials specified in this Division and as required by Contract Documents to include: supervision, operation, methods, and labor for the fabrication, installation, start-up, and tests for the complete Plumbing installation.
- B. Drawings for the Work are diagrammatic, intended to convey the scope of the Work and to indicate the general arrangement and locations of the Work. Because of the scale of the Drawings, certain basic items such as pipe fittings, access panels, and sleeves may not be shown. This Contractor shall be responsible for confirming the fixtures, piping and equipment to fit the space provided. The location and sizes for pipe fittings, sleeves, inserts, and other basic items required by code and other sections shall be coordinated and included for the proper installation of the work.
- C. Fixture and Equipment Specification may not deal individually with minute items required such as components, parts, controls, and devices which may be required to produce the equipment performance specified or as required to meet the equipment warranties. Where such items are required, they shall be included by the supplier of the equipment, whether or not specifically called for in the Contract Documents.
- D. Where the words "provide", "furnish", "include", or "install" are used in the Specification or on the Drawings, it shall mean to furnish, install, and test complete and ready for operation, the items mentioned. If an item is indicated in the Contract Documents, it shall be considered sufficient for including same in the work.
- E. Where noted on the Drawings or where called for in other Sections of the Project Manual, the Contractor for this Division shall install equipment furnished by Others and shall make required service connections. Contractor shall verify with the supplier of the equipment the requirements for the installation.
- F. Coordinate with all trades in submittal of shop drawings. Shop drawings shall be prepared clearly indicating all applicable components. Space conditions shall be detailed to the satisfaction of all concerned trades, subject to review and final acceptance by the Engineer. In the event that the Contractor installs his work before coordinating with other trades or so as to cause any interference with work of other trades, the necessary changes shall be made in the work to correct the condition, at no additional cost to the Owner.
G. Contractor must provide a payment and performance bond for their portion of the work. The payment and performance bond shall be 100% of the total bid price of the Mechanical, Plumbing and / or Fire Protection Contractor. The Contractor's portion of work includes all

equipment, devices, materials, labor, etc. in regards to this Contractor's discipline. This Contractor shall purchase all equipment, devices, materials, etc. applicable to the discipline in which the Contractor will be providing work.

1.03 CODES AND STANDARDS

A. Conform to latest edition of governing codes, ordinances, or regulations of city, county, state, or utility company having jurisdiction. Where local codes are not applicable, conform to Standard Plumbing Code; Standard Mechanical Code; Standard Fire Prevention Code and National Electrical Code.

1.04 CONTRACTOR'S QUALIFICATIONS

- A. The Contractor's qualifications listed herein are an extension to any Pre-Qualification approval received by a Contractor. The qualifications of the Contractor for this project shall be as follows s:
 - 1. The Contractor shall have been in the contracting business for the last five (5) consecutive years and under their current corporation name with 75% of the same corporate officers.
 - 2. The Contractor shall have successfully completed at least two projects of comparable size and scope within the past five (5) years.
 - 3. The Contractor's main office shall be located within 100 miles driving distance of the project. If the Contractor's office is located more than 100 miles from job site, the Contractor shall submit for approval, 10 working days prior to bidding the job, the name of the service company within a 100 mile radius of the job site, who will be responsible for any/all service required during the warranty period. In either case, the Contractor shall be responsible for having a qualified technician on the job site within 4 hours after receiving a service call.
 - 4. Contractor must provide a payment and performance bond for their portion of the work. The payment and performance bond shall be 100% of the total bid price of the Mechanical, Plumbing and / or Fire Protection Contractor. The Contractor's portion of work includes all equipment, devices, materials, labor, etc. in regards to this Contractor's discipline. This Contractor shall purchase all equipment, devices, materials, etc. applicable to the discipline in which the Contractor will be providing work
 - 5. When requested, the Contractor shall provide substantiating proof of these requirements.

1.05 FEES, PERMITS, AND INSPECTIONS

A. Secure all permits and pay all fees required, including aid to construction, in connection with the Work.

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- B. Coordinate and provide such inspections as are required by the Authorities with jurisdiction over the site.
- C. Where applications are required for procuring of services to the building, prepare and file such application with the Utility Company. Furnish all information required in connection with the application in the form required by the Utility Company.

1.06 ACTIVE SERVICES

A. Existing active services; water, gas, sewer, electric, are to be located and shall be protected against damage. Do not prevent or disturb operation of active services which are to remain. If active services are encountered which require relocation, make request to authorities with jurisdiction for determination of procedures. Where existing services are to be abandoned, they shall be terminated in conformance with requirements of the Utility or Municipality having jurisdiction.

1.07 SITE INSPECTION

- A. Contractor shall inspect the site to familiarize himself with conditions of the site which will affect his work and shall verify points of connection with utilities, routing of outside piping to include required clearances from any existing structures, trees or other obstacles.
- B. Extra payment will not be allowed for changes in the Work required because of Contractor's failure to make this inspection.

1.08 OPENINGS, CUTTING, AND PATCHING

- A. Coordinate the placing of openings in the new structure as required for the installation of the Plumbing Work.
- B. When additional patching is required due to failure to inspect work; then provide the patching required to properly close the openings, to include patch painting.
- C. When cutting and patching of the structure is made necessary due to failure to install piping, sleeves, or equipment on schedule, or due to failure to furnish, on schedule, the information required for the leaving of openings, then provide the cutting and patching as required.

1.09 WIRING FOR PLUMBING EQUIPMENT

- A. Division 26 shall provide power services for motors and equipment furnished by this Contractor to include safety disconnect switches, starters and final connections.
- B. Division 22 shall provide all motors and contactors for equipment furnished under this Division, except where they are an integral part of a motor control center which is provided under another Division.
- C. Provide internal wiring, alarm wiring including for fire protection and/or security, control wiring, and interlock wiring for equipment furnished, to include temperature control wiring.
- D. Coordinate with Division 26 all motors and other mechanical equipment which require electrical services. Provide schedule which shall include the exact location for rough-in, electrical load, size, and electrical characteristics for all services required.

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- E. Where motors or equipment furnished require larger services or services of different electrical characteristics than those called for on the Electrical Drawings, this contractor shall coordinate with the electrical contractor and the Electrical Engineer to provide a larger service as required, the cost of which shall be the responsibility of this contractor.
- F. Electrical work provided under Division 22 shall conform to the requirements of Division 26.

1.10 SUBSTITUTIONS

- A. Any equipment submitted as "equal" to the basis of design shall be accompanied with a comparison letter from the vender stating any differences from the equipment being submitted and the basis of design. A letter is also to be submitted from the vender, on the vender's letterhead, stating that the vender has received a copy of the job specifications, all addendums and any necessary drawings. For any type of "Country of Origin", ARRA, etc. requirement projects, compliance letters from the manufacturer shall be obtained ten working days prior to the bid.
- B. Substitutions for the scheduled and specified equipment shall only be done with the prior approval of the engineer, and shall be obtained in writing. Prior approvals shall be obtained no less than one week prior to the bid date. Prior approval shall not relieve the contractor of supplying equipment that meets the specifications, capacities, efficiencies, physical dimensions, etc.

1.11 PROTECTION

- A. Special care shall be taken for the protection of equipment furnished. Equipment and material shall be completely protected from weather elements, painting, plaster, etc. until the project is completed. Damage from rust, paint, scratches, etc. shall be repaired as required to restore equipment to original condition.
- B. Where the installation or connection of equipment requires work in areas previously finished by other Contractors, the area shall be protected and not marred, soiled, or otherwise damaged during the course of such work. Contractor shall arrange with the other Contractors for repairing and refinishing of such areas which may be damaged.
- C. When welding is required inside building, provide one man for a fire watch. Fire watch shall require adequate protection of existing surfaces and observance of lower floors where penetrations exist.

1.12 SUBMITTALS

- A. General
 - 1. Submit to Engineer shop drawings and product data required by the drawings and specifications.
 - 2. Contractor shall compile all data including but not limited to ductwork materials and construction details, ductwork layout, manufacturers catalog and product data, controls wiring diagrams and material data, piping, insulation, water treatment, and test and balance.

22 05 00 - 5 PLUMBING GENERAL PROVISIONS

- 3. Submit a minimum of 7 copies of data, more if required by the Architect. Also provide searchable Flash Drive of electronic submittals being submitted of the data to the Architect.
- B. Submittal Requirements
 - 1. Prepare submittals compiled in a 3-ring, hard bound, loose leaf binder. The face of the binder shall be clearly marked with the project title and number, the name of the Owner, Architect, Engineer, General Contractor and this contractor.
 - 2. The first page inside the binder shall provide an index, numerically indicating all sections applicable to this submittal.
 - 3. Separate binders shall be provided for HVAC, plumbing and fire protection trades.
 - 4. Provide tab dividers for each section submitted. In the event an item appears on the drawings not specifically covered by the specifications, provide an additional numeric tab at the end of the index detailing the item and include the submittal data in the binder.
 - 5. All equipment included on the submittal sheets shall be marked to indicate the "Tag" name or number of the equipment as shown on the drawings. The equipment shall be high-lighted, where necessary, to clarify which items are being submitted.
 - 6. For the piping submittals, when required, the contractor will be provided with an electronic copy of the plumbing floor plans. Piping layout submittals shall consist of one copy on a reproducible medium such as mylar. The drawings shall be on standard size sheets of 24" x 36" or 30" x 42". The reproducible copy shall be returned to the contractor with the engineers' approval stamp and comments.
 - 7. Submit only complete project submittals. Partial submittals or submittals not complying with the above requirements shall be returned to the contractor unmarked and rejected.
 - 8. In the interest of project expediency the contractor may pre-submit long lead items for pre-approval. However, the contractor shall not be relieved of including the same data as required by submittal binder and shall be included therein.
 - 9. The Contractor may turn in submittals without control drawings if they require a longer production time. All other items shall be included.
 - 10. Provide a tab for items not included and include an explanation of why item is not included in the submittal and the expected submittal date.
 - 11. Review shop drawings and product data prior to submission to Engineer.
 - 12. Verify field measurements, field construction criteria, catalog numbers, and similar data.
 - 13. Coordinate each submittal with work of the project and Contract Documents.
 - 14. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Engineer's review of submittals, unless Engineer gives written acceptance of specific deviations.

- 15. Notify Engineer in writing of deviations from requirements of Contract Documents at time submittals are made. A "deviation" shall be construed to mean a minor change to the sequence indicated on drawings or specification. A "deviation" is not intended to allow substitutions or product options.
- 16. Do not begin work which requires submittals until submittals have been returned with Engineer's stamp and initials or signature indicating review and approval. Materials and equipment that were installed prior to being not approved shall be removed and replaced with approved items at no additional cost to other parties.
- 17. Shop Drawings and/or submittals requiring resubmission to the Engineer due to non-compliance with the Contract Documents and/or incompleteness shall be thoroughly reviewed by the Contractor prior to delivery to the Engineer for review. The Contractor shall ensure the completeness and compliance of the submittal materials and shall reimburse the Engineer at their standard hourly billing rates for review of submittals/shop drawings beyond the second submission.
- 18. Attention is directed to the fact that Engineer's review is only to check for general conformance with the design concept of the project and general compliance with Contract Documents. No responsibility is assumed by Engineer for correctness of dimensions, details, quantities, procedures shown on shop drawings or submittals.
- 19. Omission in shop drawings of any materials indicated in Contract Drawings, mentioned in Specifications, or required for proper execution and completion of Work, does not relieve the Contractor from responsibility for providing such materials.
- 20. Approval of a separate or specified item does not necessarily constitute approval of an assembly in which item functions.

1.13 OPERATING AND MAINTENANCE MANUALS

- A. General
 - 1. Provide searchable Flash Drive in PDF format of all product data, and other information described in this Section for use in compiling operating and maintenance manuals.
- B. Compilation
 - 1. The Contractor will receive shop drawings, brochures, materials lists, technical data of all types, warranties, guarantees, and other pertinent information and will assemble, catalog, and file information in searchable PDF format on FLASH DRIVE.
 - 2. Submittal Format: (Provide each of the following items, as applicable, for each required item or system. Requirements will vary, depending on the equipment. Refer to specific Specification section requirements.)
 - a. Item: (Use appropriate Section title.)

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- b. System Description: (Provide a detailed narrative description of each system, describing function, components, capacities, controls and other data specified, and including the following:
 - (1.) Number of.
 - (2.) Sizes.
 - (3.) Type of operation.
 - (4.) Detailed operating instructions, including start-up and shut-down of each system, with indications for position of all controls, as applicable.
 - (5.) Wiring Diagrams: (Complete wiring diagrams for internally wired components including controls.)
 - (6.) Operating Sequence: (Describe in detail.)
 - (7.) Manufacturers Data: (Provide catalog data sheets, specifications, nameplate data and parts list.)
 - (8.) Preventative Maintenance: (Provide manufacturer's detailed maintenance recommendations.)
 - (9.) Trouble Shooting: (Provide manufacturer's sequence for trouble-shooting procedures for operational problems.)
 - (10.) Extra Parts: (Provide a listing of extra stock parts furnished as part of the Contract.)
 - (11.) Warranties: (Provide specific manufacturer's warranty. List each component and control covered, with day and date warranty begins, date of expiration, and name, address and telephone number of person to contact regarding problems during warranty period.)
 - (12.) Directory: (Provide names, addresses and telephone numbers of Contractor, its subcontractors, suppliers, installers and authorized service and parts suppliers. Format as follows:) Contractor: Address: Telephone No.: Person to Contact:

Subcontractor: Address: Telephone No.: Person to Contact:

Installer: Address: Telephone No.: Alabama A&M University Elmore Health Science Restroom Renovation Project No. 21224

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Person to Contact:

Manufacturer: Address: Telephone No.: Person to Contact:

Local Service Representative: Address: Telephone No.: Person to Contact:

1.14 RECORD DRAWINGS

- A. Detailed Requirements for Record Drawings
 - 1. During the progress of the work, the Contractor shall require the job superintendent for the plumbing subcontractors to record on their field sets of drawings the exact locations, as installed, of all conduits and pipes, whether concealed or exposed which were not installed exactly as shown on the contract drawings.
 - 2. The Contractor shall submit redline as-built drawings to the Engineer for review.
 - 3. The Engineer shall authorize the Contractor to produce and distribute the redline asbuilt drawings in PDF format as follows:
 - a. One (1) Flash Drive to the Engineer.
 - b. One (1) Flash Drive to the Architect.
 - c. One (1) hard copy to owner
 - d. Two (2) Flash Drive to the Owner. (PDF must be searchable)

1.15 SUBSTITUTIONS AND PRODUCT OPTIONS

- A. For products specified only by reference standard, select product meeting that standard, by any manufacturer.
- B. For products specified by naming several products or manufacturers, select any one of products and manufacturers named which complies with specifications.
- C. For products specified by naming several products or manufacturers and stating "or equivalent", "or equal", or "or Engineer approved equivalent", or similar wording, submit a request for proposed substitutions for any product or manufacturer which is not specifically named; for review and approval by the Engineer.
- D. For products specified by naming only one product and manufacturer, there may be an option of an Engineer approval of a product of equal or greater quality or size.

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1.16 SUBSTITUTION SUBMISSIONS

- A. Contractor's Base Bid shall be per contract documents.
- B. Submit separate request for each substitution. Support each request with:
 - 1. Complete data substantiating compliance of proposed substitution with requirements stated in contract documents:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature; identify:
 - (1.) Product description.
 - (2.) Reference standards.
 - (3.) Performance and test data.
 - c. Name and address of at least two similar projects on which product has been used, and date of each installation.
 - d. Itemized comparison of the proposed substitution with product specified list significant variations.
 - e. Data relating to changes in construction schedule.
 - f. Any effect of substitution on separate contracts.
 - g. List of changes required in other work or products.
 - h. Designation of availability of maintenance services, sources of replacement materials.
 - i. Provide certification of product compatibility with adjacent materials.
- C. Substitutions will not be considered for acceptance when:
 - 1. They are indicated or implied on shop drawings or product data submittals without a formal request from Contractor or his supplier prior to bid.
 - 2. Acceptance will require substantial revision of contract documents.
 - 3. In judgement of Engineer, do not include adequate information necessary for a complete evaluation.
 - 4. Substitute products shall not be ordered or installed without written acceptance of Engineer.
 - 5. Engineer will determine acceptability of proposed substitutions.

1.17 CONTRACTOR'S SUBSTITUTION RESPONSIBILITIES

A. In making formal request for substitution, Contractor represents that:

- 1. He has investigated proposed product and has determined that it is equivalent to or superior in all respects to that specified.
- 2. He will provide same warranties or bonds for substitution as for product specified.
- 3. He will coordinate installation of accepted substitution into the work and will make such changes as may be required for the work to be complete in all respects. This includes revisions due to changes in electrical characteristics, physical size and weight, service requirements, service clearances, etc.
- 4. He waives claims for additional costs caused by substitution which may subsequently become apparent.
- B. The contractor shall have included all costs associated with the substitution for the specified products or materials, and that no additional cost will be incurred by any other party in order to fully incorporate the substituted item(s).
- C. The contractor agrees to reimburse the Architect/Engineer for any architectural or engineering re-design that is required by the substitution to be fully incorporated. The reimbursement shall be at the Architect/Engineer's standard billing rate.

1.18 ENGINEER DUTIES

- A. Review Contractor's requests for substitutions with reasonable promptness.
- B. Notify Contractor in writing of decision to accept or reject requested substitution.

1.19 CONTRACTOR OBSERVATION DUTIES

- A. When the Contractor schedules an observation for the Engineer, all work for that observation, i.e., underground, above ceiling, or in walls prior to gypsum board installation, shall be completed. If the work is not complete and not ready for inspection, the Engineer will notify the Contractor that the inspection was not performed. The Contractor shall complete the work, and then re-schedule the inspection for the Engineer, for which the Contractor shall reimburse the Engineer at their normal hourly billing rates.
- B. Minimum Required inspections by Engineer:
 - 1. Underground utilities with appropriate test prior to covering pipe.
 - 2. In walls prior to gypsum board installation.
 - 3. Above ceiling: Prior to ceiling installation.
 - 4. Piping systems testing: When performed in smaller sections, the entire system will be required to be retested.

1.20 FINISHING

- A. General: Prior to acceptance of the installation and final payment of the Contract, the Contractor shall perform the work outlined herein.
- B. Cleaning: At the conclusion of the construction, the site and structure shall be cleaned thoroughly of all debris and unused materials remaining from the mechanical construction. All closed off spaces shall be cleaned of all packing boxes, wood frame members, and other waste materials used in the mechanical construction.

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- C. The entire system of piping and equipment shall be cleaned internally. The Contractor shall open all dirt pockets and strainers, completely blowing down as required and clean strainer screens of all accumulated debris.
- D. All tanks, fixtures, and pumps shall be drained and proven free of sludge and accumulated matter.
- E. All temporary labels, stickers, etc., shall be removed from all fixtures and equipment. (Do not remove permanent name plates, equipment model numbers, ratings, etc.). All equipment shall have affixed adjacent to the permanent nameplate, the unit identification on an engraved label with permanent adhesive.
- F. Plumbing fixtures, equipment, tanks, pumps, etc., shall be thoroughly cleaned.

1.21 TEST AND DEMONSTRATIONS

- A. Systems shall be tested and placed in proper working order prior to demonstrating systems to Owner.
- B. Prior to acceptance of the mechanical installation, demonstrate to the Owner or his designated representatives all essential features and functions of all systems installed, and instruct the Owner in the proper operation and maintenance of such systems. The contract shall allow for five (5) working days to perform the demonstrations.
- C. Provide necessary trained personnel to perform the demonstrations and instructions. Provide manufacturer's representatives for systems as required to assist with the demonstrations.
- D. Provide video/Audio FLASH DRIVE of demonstrations in close out documents.
- E. Dates and times for performing the demonstrations shall be coordinated with the Owner.
- F. Upon completion of demonstrations, provide a certificate testifying that demonstrations have been completed. Certificate shall list each system demonstrated, dates demonstrations were performed, names of parties in attendance, and shall bear signatures of contractor and owner.

1.22 PAINTING AND IDENTIFICATION

- A. Touch-up paint where damaged on equipment furnished with factory applied finish, to match original finish.
- B. Provide engraved, laminated plastic tags for all equipment. Tags shall be attached with permanent adhesive.

1.23 EXCAVATING, TRENCHING, AND BACKFILLING

A. Provide excavation necessary for underground water piping, etc., and backfill such trenches and excavations after work has been installed and tested. Care shall be taken in excavating, that walls and footings and adjacent load bearing soils are not disturbed, except where lines must cross under a wall footing. Where a line must pass under footing, the crossing shall be made by the smallest possible trench to accommodate the pipe. Excavation shall be kept Alabama A&M University Elmore Health Science Restroom Renovation Project No. 21224

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free from water by pumping if necessary. No greater length of trench shall be left open, in advance of pipe and utility laying, than that which is authorized.

- B. Trenches for piping and utilities located inside foundation walls and to point five (5) feet outside of the wall shall be not less than sixteen (16) inches nor more than twenty-four (24) inches wider than the outside diameter of the pipe to be laid. The widths of trenches for piping and utilities located more than five (5) feet outside of building foundation walls, other than for sewers, shall be governed by conditions found at the site.
- C. Bottoms of trenches shall be so shaped that when pipe is in place the lower fourth of the circumference for the full length of the barrel will be supported on compacted fill. Bell holes shall be dug so that no part of the weight of the pipe is supported by the bell but shall be no larger than necessary for proper jointing. All sewers and piping required for the structure shall be excavated to at least (6) inches below pipe invert.
- D. Immediately after testing and/or inspection, the trench shall be carefully backfilled 6" above pipe, and sloped as specified. Backfill shall be No. 57 crushed stone. Interior backfill of #57 stone shall be full depth from top of bedding to bottom of slab. Exterior bedding #57 stone, free from clods, brick, etc., to a depth one-half the pipe diameter and then firmly puddled and tamped in such a manner as not to disturb the alignment or joints of the pipe. Thereafter, the backfill shall be earth, free from clods, brick, etc., puddled and tamped every vertical foot

1.24 CONCRETE WORK

- A. Provide concrete bases and housekeeping pads for all equipment installed at finish floor level. Concrete work shall be as specified in the applicable Civil/Site and Structural Sections. Vibration pads, equipment bases, pipe supports and thrust blocks shall be provided by this Contractor.
- B. Provide equipment anchor bolts and coordinate their proper installation and accurate location.

1.25 ACCESS PANELS

A. Provide access panels where required and not shown on the drawings for installation by the drywall or masonry Contractor. Access panels shall be as specified in the applicable architectural section. All access panel locations which allow access to equipment shall be approved by the Architect/Engineer.

1.26 SLEEVES

- A. Sleeves passing through non-fire rated walls and partitions shall be Schedule 10 black steel.
- B. Sleeves passing through load bearing walls, concrete beams, foundations, footings, and waterproof floors shall be Schedule 40 galvanized steel pipe or cast iron pipe.
- C. Sleeves passing through non-load bearing walls, concrete beams, foundations, footings, and waterproof floors shall be Schedule 40 PVC or cast iron.

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- D. Sleeves for insulated piping shall be of sufficient internal diameter to take pipe and insulation and to allow for free movement of pipe. Waterproof sleeves shall be of sufficient internal diameter to take pipe and waterproofing material.
- E. In finished areas where pipes are exposed, sleeves shall be terminated flush with wall, partitions, and ceilings, and shall extend 1/2" above finished floors. Extend sleeves 1" above finished floors in areas likely to entrap water.
- F. Pipe to wall penetration closures for underground pipe penetrations of walls shall be "Link-Seal" as manufactured by Thunderline Corporation, or equal.

1.27 ESCUTCHEONS

A. Provide chrome plated escutcheons at each sleeved opening into finished and exposed exterior spaces. Escutcheons shall fit around insulation or around pipe when not insulated; outside diameter shall cover sleeve. Where sleeve extends above finished floor, escutcheon shall be high cap type and shall clear sleeve extension. Secure escutcheons or plates to sleeve but not to insulation with set screws or other approved devices.

1.28 INSULATION PROTECTION

A. Where exposed insulated piping extends to floor, provide sheet metal guard around insulation.

1.29 ANCHORING OF EQUIPMENT

A. All equipment located on floor slab, that is not mounted on wheels shall be secured to the floor with anchor bolts. A minimum of two bolts are required per each piece of equipment and bolts shall be of sufficient size to prevent equipment from overturning.

1.30 ISOLATION OF EQUIPMENT

A. All equipment shall be installed with isolating service valves. Unions or flange fittings shall be provided for removal of the isolated equipment.

1.31 PROTECTION OF ELECTRICAL EQUIPMENT

A. Water or waste & vent piping shall not be installed in electrical rooms, communication rooms or directly above electrical equipment.

1.32 CONNECTIONS FOR FIXTURES AND EQUIPMENT UNDER ANOTHER SECTION OR BY OWNER

- A. Rough all equipment requiring connection to systems provided under this Division. Verify requirements and current locations before proceeding with work.
- B. Make all connections to equipment furnished under another Section or by owner as required to obtain complete and working systems.

1.33 SYSTEM GUARANTEE

22 05 00 - 14 PLUMBING GENERAL PROVISIONS

- A. Work required under this Division shall include one-year guarantee. Guarantee by Contractor to Owner is to replace for Owner any defective workmanship or material which has been furnished under contract at no cost to the Owner for a period of one year from date of substantial completion. Guarantee shall also include all reasonable adjustments of system required for proper operation during guarantee period. Guarantee shall <u>not</u> include normal preventative maintenance services or filters.
- B. At "Demonstration", one-year guarantee provision by Contractor shall be explained to Owner.
- C. All sealed hermetic refrigeration systems shall be provided with five-year factory warranty from date of substantial completion.

1.34 CLEANING

A. At completion of all work, fixtures, exposed materials and equipment shall be cleaned with manufacturers' recommended cleaning methods and materials. Do the following:

Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.

Remove sediment and debris from drains.

After completing installation of exposed, factory-finished fixtures, faucets, and fittings, inspect exposed finishes and repair damaged finishes.

1.35 FINAL ACCEPTANCE

A. Before final acceptance, the Plumbing Contractor shall furnish a certificate of inspection and final approval from the plumbing Inspector to the Owner and be in accordance with the latest revisions of the applicable codes and the Approved Plumbing Drawings and Specifications. Contractor shall also furnish booklet of test, sterilization compliance and backflow devices certificates.

END OF SECTION

SECTION 22 05 05

PLUMBING DEMOLITION

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Remove existing equipment, piping, insulation, controls, etc. as indicated on the drawings and dispose of properly.

1.02 EXISTING CONDITIONS

- A. Contractor shall visit site prior to bidding; the contractor shall become familiar with the requirements and intent of the drawings. This will include confirming existing pipe to be connected too as well as condition of existing pipe or replacement as required to make proper connection PRIOR to bidding to provide a fully functional and operating system.
- B. Drawings show known existing services in reasonable proximity. Contractor shall field verify exact locations and make connections as required based on existing field conditions.
- C. There will be no allowances made for failure of the contractor to familiarize themselves with the extent of work required under the specifications or drawings.
- D. Contractor shall visit the site to verify existing conditions. existing concealed conditions and connections are based upon information taken from limited field investigations. Contractor shall make required adjustments to system components as necessitated by actual field conditions at no additional cost to owner or architect. Report any discrepancies between the drawings and actual field conditions to the architect before construction begins or PRIOR to bidding.
- E. Patch all finishes to match existing, including but not limited to, gypsum board, plaster, acoustic systems, wood trim, covers, base, panels, rails and wainscot. verify match of new finish materials to existing in color, texture, thickness, cut, etc. to satisfaction of Architect prior to installations. Provide other materials to match existing when required, to be approved by Architect.
- F. All existing piping not required under the new layout, shall be removed. Removal shall include, but is not limited to insulation, fittings, valves and supports.

1.03 SALVAGED MATERIALS OR EQUIPMENT

- A. Equipment and materials shall be removed from the jobsite at no additional expense to the owner.
- B. All equipment indicated on the drawings shall be turned over to the owner.
- C. Any material posing a hazard shall be removed from the jobsite immediately.

PART 2 – EXECUTION

2.01 GENERAL

A. Contractor shall submit a plan for approval by the Architect for phasing of demolition to minimize utility outages and interference with other trades and occupied portions of the building.

22 05 05 - 2 PLUMBING DEMOLITION

B. Contractor shall coordinate utility outages with the General Contractor, Owner and Architect by providing three days written notice of times and locations of utility outages and anticipated time of restoration.

2.02 PROTECTION OF EXISTING TO REMAIN

- A. Provide tarps, plywood, and any other protectionary devices to protect existing finishes, furniture, appliances, equipment, etc.
- B. Damages to any afore mentioned shall be replaced by this contractor at no cost to the owner.

2.03 PROHIBITED METHODS

- A. Jack Hammers shall not be used without the written approval of the Architect. The Architect reserves the right to withdraw approval for the use of jack hammers at any time if their use create excessive noise and/or vibration as deemed by the Architect.
- B. Explosives of any type shall not be used.
- C. Burning shall not be used as a means of demolition and/or disposal. Cutting torches shall not be considered as burning.

2.04 DUST CONTROL

A. Provide tarps, temporary walls, etc. as required to prevent the spread of dust through the building unnecessarily.

END OF SECTION

22 05 32 - 1 PLUMBING SUPPORTS AND ANCHORS

SECTION 22 05 32

PLUMBING SUPPORTS AND ANCHORS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Pipe, equipment hangers, supports, and associated anchors.
- B. Equipment bases and supports.
- C. Sleeves and seals.
- D. Flashing and sealing equipment and pipe stacks.

1.02 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

A. Furnish hanger and support inserts sleeves for placement into formwork.

1.03 SUBMITTALS

- A. Submit shop drawings and product data for all items listed under this section.
- B. Indicate hanger and support framing and attachment methods.

PART 2 PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

- A. Hangers for Pipe Sizes 1/2 to 4 inches: Carbon steel, adjustable, clevis.
- B. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods; cast iron roll and stand for hot pipe sizes 6 inches and over.
- C. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
- D. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp; adjustable steel yoke and cast iron roll for hot pipe sizes 6 inches and over.
- E. Vertical Support: Steel riser clamp.
- F. Floor Support for Pipe Sizes to 4 Inches and All Cold Pipe Sizes: Cast iron adjustable pipe saddle, locknut nipple, floor flange, and concrete pier or steel support.
- G. Un-insulated Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- H. Shield for Insulated Piping 1 1/4 Inches and Smaller: 16 gage galvanized steel saddle over insulation in 180 degree segments, minimum 16 inches long per pipe support.

22 05 32 - 2 PLUMBING SUPPORTS AND ANCHORS

- I. Shield for Insulated Water Piping 1 1/2 Inches and Larger: Rigid non-conducting blocking in 180 degree segments, 16 inch minimum length with block thickness the same as insulation thickness and with an inner contour of the supporting pipe. Install with 18 gage galvanized steel saddle per pipe support.
- K. Shields for Vertical Copper Pipe Risers: Sheet lead.

2.02 HANGER RODS

A. Steel Hanger Rods: Galvanized threaded both ends, threaded one end, or continuously threaded.

2.03 FLASHING

- A. Metal Flashing: galvanized steel.
- B. Lead Flashing: 5 lb/sq ft sheet lead for waterproofing; one lb/sq ft sheet lead for soundproofing.
- C. Flexible Flashing: 47 mil thick sheet butyl; compatible with roofing.
- D. Caps: Steel, 20 gage minimum; 16 gage at fire resistant elements.

2.04 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: Form with Schedule 10 black steel pipe.
- B. Sleeves for Pipes Through Non-fire Rated Walls, Footings, and Potentially Wet Floors: Form with schedule 10 steel pipe.
- C. Sleeves through beams shall be Schedule 40 steel; only in locations approved by the Structural Engineer.
- D. Sleeves through beams shall be Schedule 40 steel; only in locations approved by the Structural Engineer.
- E. Sleeves for floor or wall penetrations at rated assemblies shall conform to Specifications Section 220560.

2.05 FABRICATION

- A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- B. Design hangers without disengagement of supported pipe.

2.06 FINISH

A. Prime coat steel hangers and supports.

22 05 32 - 3 PLUMBING SUPPORTS AND ANCHORS

PART 3 EXECUTION

3.01 PIPE HANGERS AND SUPPORTS

A. Support horizontal piping as follows:

PIPE SUPPORT SCHEDULE					
Pipe	Support Spacing			Hanger Rod	
Size	Sched 40	Copper	PVC	Cast Iron	Diameter
	Black Steel			Soil Pipe	
1/2"	-	5'-0"	4'-0"	-	3/8"
3/4"	7'-0"	5'-0"	4'-0"	-	3/8"
1"	7'-0"	6'-0"	4'-0"	-	3/8"
1-1/4"	7'-0"	7'-0"	4'-0"	-	3/8"
1-1/2"	9'-0"	8'-0"	4'-0"	-	3/8"
2"	10'-0"	8'-0"	4'-0"	5'-0"	3/8"
2-1/2"	10'-0"	9'-0"	4'-0"	5'-0"	1/2"
3"	10'-0"	10'-0"	4'-0"	5'-0"	1/2"
4"	10'-0"	10'-0"	4'-0"	5'-0"	1/2"
6"	10'-0"	10'-0"	4'-0"	5'-0"	5/8"
8"	10'-0"	10'-0"	4'-0"	5'-0"	3/4"
10"	10'-0"	10'-0"	4'-0"	5'-0"	7/8"

Note: Rods may be reduced one size for double rod hangers, with 3/8" being the

- B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- C. Place a hanger within 12 inches of each horizontal elbow.
- D. Use hangers with 1-1/2 inch minimum vertical adjustment.
- E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
- G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- H. Support riser piping independently of connected horizontal piping.
- I. All hangers, hanger rods, supports, etc. shall be double-nutted.

22 05 32 - 4 PLUMBING SUPPORTS AND ANCHORS

3.02 EQUIPMENT BASES AND SUPPORTS

- A. Provide equipment bases of concrete type.
- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct support of steel members. Brace and fasten with flanges bolted to structure.
- D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.03 FLASHING

- A. Provide flexible flashing and metal counter-flashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Flash vent and soil pipes projecting 3 inches minimum above finished roof surface with lead worked one inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counter-flash and seal.
- C. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp device.
- D. Seal floor, and mop sink drains watertight to adjacent materials.
- E. Provide acoustical lead flashing around ducts and pipes penetrating equipment rooms, installed in accordance with manufacturer's instructions for sound control.

3.04 SLEEVES

- A. In finished areas where pipes are exposed, sleeves shall be terminated flush with wall, partitions, and ceilings, and shall extend 1" above finished floors. Extend sleeves 1" above finished floors in areas likely to entrap water. Caulk sleeves full depth and provide floor plate.
- B. Install chrome plated steel escutcheons at finished surfaces
- C. Install stainless steel escutcheons at exterior surfaces.

END OF SECTION

SECTION 22 05 53

PLUMBING IDENTIFICATION

PART 1 GENERAL

1.01 WORK INCLUDED

A. Description of Work: Provide all labor, materials, equipment and services required for complete installation of all plumbing identification indicated on Drawings and specified herein. Identification of domestic nitrogen, argon, compressed air, cold, hot & recirculating water, non-potable water, service valves, natural gas, sanitary drain, sanitary vent, emergency rain leaders and rain leader piping systems.

1.02 SUBMITTAL

A. Submit samples and manufacturer's installation instructions for all plumbing identification products used.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Ceiling Markers: Markserv MS900 self adhesive vinyl, 0.0032" thick PVC with permanent pressure-sensitive acrylic adhesive for use of identifying valve locations above acoustical tile ceilings 7/8" diameter, 7 colors available - yellow, green, blue, orange, black, red and white. Fire protection water color to be orange with white number. Markers shall be numbered consecutively with standard 3/16" characters. Markers shall be installed on metal grid of layin ceilings and located within 24" of valve above ceiling. Markers shall be Markserv, Seton or equal.
- B. Plastic Nameplates (Equipment): Laminated three-layer plastic with engraved white letters on black background color.
- C. Metal Tags: Brass with 1/2 inch high black filled numbers and/or letters, minimum 1-1/2 inch diameter, brass link chain and hooks.
- D. Interior of building pipe markers: Seton Economy Self-Adhesive Pipe Markers: Color coded background, color of legend letter size and length of letter size and length of color field shall conform completely with the latest edition of ANSI A13.1. Markers shall indicate direction of flow. Legends shall be alternately reversed and repeated for viewing from any angle. Markers shall be by Seton, Kolbi, Brady, or approved equal or approved equal.
- E. Exterior and Limited Interior pipe markers: Snap/Strap-Around Markers: Outdoor grade acrylic plastic with UV inhibitors. Color coded background, color of legend letter size and length of letter size and length of color field shall conform completely with the latest edition of ANSI A13.1 markers shall indicate direction of flow. Legends shall be alternately reversed and repeated for viewing from any angle. Markers shall be factory formed for the installed diameter. Markers less than 6 inch diameter shall snap-on. Markers 6 inch diameter and larger shall be secured with stainless steel spring fasteners provided by the marker manufacturer. Markers shall be Set Mark pipe markers by Seton or approved equal.

22 05 53 - 2 PLUMBING IDENTIFICATION

PART 3 EXECUTION

3.01 GENERAL

A. Degrease and clean surfaces to receive adhesive for roll form pipe identification markers. These markers shall be installed on piping above ceilings.

3.02 PIPING

- A. Piping shall be identified at maximum 10 feet intervals, at each side of wall penetration, and at each valve. Piping in exposed areas may be identified at maximum 20' intervals. Piping identification shall include type of service and direction of flow.
- B. Piping above ceiling shall be marked by the following schedule:
 - 1. Domestic Cold Water White letters on Green, Seton Style No. 29958.
 - 2. Domestic Hot Water Black letters on Yellow, Seton Style No. 99368.
 - 3. Hot Water Return Black letters on Yellow, Seton Style No. 99288.

3.03 VALVES

- A. Valves in main and branch piping shall be identified with metal tags chained to the valve.
- B. Provide valve chart and schedule in aluminum frame with clear plastic shield. Install at location as directed.
- C. All valves locations shall be marked below the ceiling with color coded markers i.e. color dot on ceiling grid. Colored marker shall be submitted for approval.

3.04 EQUIPMENT

- A. Large equipment such as water heaters and pumps, etc., shall be identified with plastic laminated nameplates.
- B. Control panels and major control components not located at control panels shall be identified with plastic nameplates.

END OF SECTION

22 05 60 - 1 PLUMBING THROUGH PENETRATION FIRE STOPPING

SECTION 22 05 60

PLUMBING THROUGH PENETRATION FIRE STOPPING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide fire stopping for ALL through penetrations.

1.02 REFERENCES

- A. Underwriters Laboratories (UL)
- B. American Society for Testing and Materials (ASTM)

1.03 CONTRACTOR REQUIREMENTS

A. This work shall be performed by a contractor trained in the installation or application of systems similar in complexity to those required for this project. The contractor shall have at least 2 years experience with through penetration fire stopping systems and shall have completed a least 5 comparable scale projects using these systems.

1.04 SUBMITTALS

- A. Product data including the following:
 - 1. Manufacturers specifications and technical data
 - 2. Detailed specification of construction and fabrication installation instructions
- B. Shop drawings
 - 1. For each standard application of penetration item and surface being penetrated provide a manufacturers UL approved system cut sheet identifying the UL system number, UL classified devices or materials to be used, other materials to be used, anchorages, sleeves, annular space requirements and sizes, dimensions and locations of all items.
 - 2. For each non-standard application, provide a manufacturer's qualified engineering judgment and drawing. The drawing shall indicate those items specified in "A" above.
 - 3. All UL approved systems shall be selected based on their "F" rating. All systems shall provide the same ratings as the rating of the floor or wall being penetrated, as shown on the plans.

22 05 60 - 2 PLUMBING THROUGH PENETRATION FIRE STOPPING

C. Qualifications

- 1. Provide list of past projects indicating past experience.
- 2. Provide statement from manufacturer that installer has to be trained in the proper method of installing fire stop systems.

D. Guarantee

1. Submit copies of written guarantee agreeing to repair or replace joint sealers which fail in joint adhesion, co-adhesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability or appear to deteriorate in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated. The guarantee period shall be one year from date of substantial completion.

1.05 STORAGE

A. Coordinate delivery with scheduled installation date, comply with manufacturers maximum storage requirements. Store materials in a clean, dry, ventilated location. Protect from soiling, abuse, moisture and freezing.

1.06 **PROJECT CONDITIONS**

- A. Contractor shall visit the job site prior to bid, to verify wall and floor types to be penetrated. Fire ratings of walls are indicated on the plans. Ratings of the floors are assumed to be two (2) hours unless otherwise indicated on the Architectural Plans.
- B. Contractor shall coordinate with the other trades for any penetrating items (pipe, conduit, etc.) that have to be routed differently than shown on the plans. Contractor shall provide fire stopping for all rerouted items whether different UL approved systems or additional materials are required.

PART 2 PRODUCTS

2.01 THROUGH PENETRATION FIRE STOPPING

- A. Acceptable manufacturers and products shall be those listed in the UL fire resistance directory for the UL system involved.
- B. All systems and devices shall be asbestos free.
- C. Systems or devices listed in the UL. Fire resistance directory under categories XHCR and XHEZ may be used, providing that it conforms to the construction type, penetration type, annular space requirements and fire rating involved in each separate instance and that the system be symmetrical for wall applications.
- D. Fill, void or cavity materials shall be as classified under category XHHW in the UL fire resistance directory.

22 05 60 - 3 PLUMBING THROUGH PENETRATION FIRE STOPPING

- E. Forming materials shall be as classified under category XHKU in the UL fire resistance directory.
- F. All fire-stopping products shall be from a single manufacturer.

PART 3 EXECUTION

3.01 GENERAL

- A. Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
- B. Verify barrier penetrations are properly sized and in suitable condition for application of materials.
- C. Do not proceed until unsatisfactory conditions have been corrected.
- D. Clean surfaces to be in contact with penetration seal materials, of dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting, adhesion, or the required fire resistance.

3.02 INSTALLATION

- A. Install penetration seal materials in accordance with printed instructions of the U.L. Fire Resistance Directory and in accordance with manufacturer's instruction.
- B. Where floor openings without penetrating items are more than four inches in width and subject to traffic or loading, install fire stopping materials capable of supporting same loading as floor.
- C. Protect materials from damage on surfaces subject to traffic.
- D. Place rock wool or other approved non-flammable material in annular space around fire dampers before installation of damper's anchoring flanges, which are installed in accordance with fire damper manufacturers' recommendations.
- E. Where large openings are created in walls or floors to permit installation of pipes, ducts, cable tray, bus duct or other items, close unused portions of opening with fire stopping material tested for the application. See U.L. Fire Resistance Directory and Section 3.06 of this document.
- F. Where rated walls are constructed with horizontally continuous air space, double width masonry, or double stud frame construction, provide vertical, 12 inch wide fiber dams for full thickness and height of air cavity at maximum 15 foot intervals.

22 05 60 - 4 PLUMBING THROUGH PENETRATION FIRE STOPPING

3.03 ADJUSTING AND CLEANING

- A. Clean up spills of liquid components.
- B. Neatly cut and trim materials as required.
- C. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

3.04 FIELD QUALITY CONTROL

- A. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.
- C. Perform under this section patching and repairing of fire stopping caused by cutting or penetration by other trades.

END OF SECTION

22 07 10 - 1 INSULATION FOR PLUMBING SYSTEMS

SECTION 22 07 10

INSULATION FOR PLUMBING SYSTEMS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Work of this section shall include the thermal insulation for the following plumbing systems that may or may not be present on this project: NOTE: Items not applicable noted as (N/A)
 - 1. Rain Leaders and/or Emergency Rain Leaders (N/A)
 - 2. Traps, trap arms, cold and hot water supplies
 - 3. Traps on condensate receiving floor drains above grade (N/A)
 - 4. Equipment (N/A)
 - 5. Hot water piping below grade (N/A)
 - 6. Domestic cold water, domestic hot water, hot water recirculating and non-potable water
- B. This work shall be performed by a competent insulation contractor whose primary business is the installation of insulation systems and who has been in this business for a minimum of five years. The Insulation Contractor shall be independent of the Plumbing Contractor.

1.02 SUBMITTALS

- A. Provide submittals consisting of product literature for each insulation type, finish type and equipment served. Provide submittals on method of installation for each type of insulation used.
- B. Product samples and installation samples are required and shall be provided at the discretion of the engineer. Samples may include but are not limited to, 90° Ells, 45° Ells, valves and sections of pipe.
- C. Provide submittals consisting of Insulation Contractor's qualifications
- D. Mockups: Before installing insulation, build mockups for each type of insulation and finish listed below to demonstrate quality of insulation application and finishes. Build mockups in the location indicated or, if not indicated, as directed by Engineer. Use materials indicated for the completed Work. Piping Mockups:
 - 1. One 3 foot section of NPS 2 straight pipe with a joint.
 - 2. One each of a 90-degree threaded, flanged, & sweat elbow.
 - 3. One NPS 2 or smaller valve and one NPS 2-1/2 or larger valve.
 - 4. Each type of support hanger to be used including hanger saddle and rigid insulation as specified.
 - 5. One threaded strainer and one flanged strainer with removable portion of insulation.

PART 2 PRODUCTS

2.01 THERMAL INSULATION

A. All insulating systems shall be tested on a composite basis in accordance with ASTM E-84, NFPA 255 and UL 723. All material shall be finished with surfaces having a maximum flame spread rating of 25 and a maximum smoke developed rating of 50 and under ASTM E-84.

22 07 10 - 2 INSULATION FOR PLUMBING SYSTEMS

- B. Interior piping Rigid Fiberglass .23K Factor, 3.5 To 5.5 PCF size dependent density, minimum 4.3 R value, 0°F to 1000°F operating temperature, flame spread rating 25, maximum smoke developed rating 50 & fungi resistant jacket. Insulation shall be Owens Corning Fiberglass ASJ/SSL-II with positive closure system, or prior approval.
- C. Interior fittings on 1/2 and 3/4 inch pipes and accessories may use job built mitered fittings of similar material as piping. Fittings 1 inch and up will use molded preformed fiberglass fittings sized for the fitting or device being insulated. All fittings and devices being insulated shall be covered with a preformed, white, snap-on type, molded PVC jacket cover. Stainless steel tack fasteners hold the cover together at the overlapping throat seam. Matching white, pressure sensitive tape seals and finishes the fitting and adjacent pipe insulation joint. Molded covers shall be equal to Certainteed Snap Form Fitting System. Fittings and accessories to be covered include, but not limited to, 45 and 90-degree elbows, tees, reducers, increasers, valves, check valves & unions.
- Above ground exterior piping shall be equal to Foamglass .33K factor suitable for 900°F, 8.5 # density per square foot. Equal to Pittsburgh Corning - Strata - Fab system with ASJ jacket.
- E. Fittings for above ground exterior piping shall be machine formed, routed and fitted for specific size fitting and of same material as in D.
- F. Below ground exterior piping shall be of same materials as D except without ASJ jacket.
- G. Below ground exterior fittings shall be of same material as in D except without ASJ jacket.
- H. Closed cell, flexible elastomeric thermal insulation, black in color, supplied in unslit tubing, equal to Armaflex AP 2000.
- I Closed cell, flexible elastomeric thermal sheet insulation, 1/2 inch thick, black in color.
- J. Semi-rigid fiberglass board, 3 lb density, thermal conductivity compliance ASTM C 165, 650°F temperature limit, 1 1/2" thick. High temperature fiberglass bonded to a flexible jacketing. Jacketing is to be laminated of white Kraft and aluminum foil, reinforced with fiberglass, chemically treated for fire and smoke safety. Equal to Manville Pipe and Tank insulation.

2.02 INSULATION FINISH MATERIALS

- A. White all Service Jacket(ASJ).
- B. Glass fabric equal to Foster Mast-A-Fab.
- C. Smooth Aluminum 0.016-inch thickness and 0.032 inch thickness for exterior use. Equal to Pabco.
- D. Aluminum fittings for elbows, tees and devices, precision formed, smooth and mar-free finish, 0.024 inches thick. Equal to Pabco.
- E. Roofing Felt, 15 lb.
- F. Black asphaltic cutback mastic for underground or outdoor use. Equal to Foster C.I. Mastic 60-25.

22 07 10 - 3 INSULATION FOR PLUMBING SYSTEMS

2.03 ADHESIVES

A. An air-drying contact adhesive specifically designed for joining seams and ends of Armaflex AP-2000 in Specification Section 2-2.1 I. Equal to Armstrong 520 Adhesive.

2.04 FINISHES

A. A white elastomeric, UL classified outdoor grade, vinyl mastic for finished outdoor insulation. Water based latex enamel; equal to WB Armaflex Finish.

PART 3 EXECUTION

3.01 WORKMANSHIP

- A. All materials shall be applied by workmen skilled in this trade. Unsightly work shall be cause for rejection.
- B. Mechanical fasteners shall be used whenever possible to assure permanent construction.
- C. Materials shall be applied only after systems have been tested and all surfaces are clean and dry.
- D. Cellular glass block supports or other suitable non-compressible insulation material equal in thickness to the insulation and 12 inches in length shall be installed at hangers to eliminate through-metal conductance. Provide 16 GA, 180 degree, galvanized sheet metal saddles in lengths as detailed on the drawings.
- E. All insulation shall be vapor sealed. All joints, laps, breaks, and faults in vapor barriers of insulations covering cold surfaces, shall be thoroughly sealed.
- F. Insulation that becomes wet for any reason shall be removed, replaced and resealed at the expense of this Contractor.
- G. Piping systems requiring testing to be witnessed by the Engineer shall not be insulated until such systems have been tested and approved.
- H. Do not insulate any moving parts; valve handles, expansion tanks or backflow preventers.

3.02 APPLICATION

A. Insulation application schedule

NOMINAL PIPE SIZE	INTERIOR	EXTERIOR ABOVE GRADE	BELOW GRADE/SLAB
1/2" - 1"	1"	1"	1"
1 1/4" - 2 1/2"	1"	1 1/2"	1"

1.

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	3" and above	1 1/2"	2"	1 1/2"
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B. Rigid Fiberglass Insulation For interior domestic cold, hot & recirculating,

> Piping All insulation shall be butted together and securely stapled in place with outward clinching staples on 3" centers on the lapping seams. Factory provided laps of ASJ tape of same type as jacket on insulation shall be used on butt joints as per (Part 2-2.01-B).

- Fittings
 Fittings shall be molded fiberglass with snap on PVC jacket and matching white tape on adjacent pipe insulation as per (Part 2-01-C).
- 3. Piping in concrete masonry walls (CMU): All insulation shall be as per (Part 2.01-H) with Armacell fabricated fittings. Provide AP Armaflex Insulation tape and/or Armaflex adhesives as required for joints and fittings as recommended by manufacturer. Provide Armaflex pipe hangers when required for supports.
- C. Rain Leaders and/or Emergency Rain Leaders

NOMINAL PIPE SIZE	EXPOSED CONDITIONED SPACE	EXPOSED NON- CONDITIONED SPACE	CONCEALED WITHIN BLDG. INSULATION	CONCEALED OUTSIDE BUILDING INSULATION
3" and 4"	1"	1 1/2"	1"	2"
6" to 10"	1"	1 1/2"	1"	2"
12" to 16"	1 1/2"	2"	1 1/2"	2 1/2"
18" to 24"	2"	2 1/2"	2"	2 1/2"

1. Insulation Thickness Schedule

- 2. Rain leaders and emergency rain leaders are to be completely insulated including all portions of horizontal and 24" vertically beyond last elbow where piping transitions downward. Insulation will continue up to the roof drain hub joint. The roof drain hub and pan and any area surrounding the roof drain exposed shall be insulated by this contractor.
- 3. Piping

All insulation shall be butted together and securely stapled in place with outward clinching staples on 3" centers on lapping seams. Factory provided laps of ASJ tape of same type as jacket on insulation shall be used on butt joints as per (Part 2.01-B).

4. Fittings Fittings shall be molded fiberglass with snap on PVC jacket and matching white tape

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on adjacent pipe insulation as per (Part 2.01-C).

- 5. Roof drain hubs and pans to be insulated per (Part 2.01-I) Miter cut the insulation to fit and glue into place.
- 6. At ends of pipe insulation, bevel the insulation 30 degrees and seal with two coats Childers CP-30.
- D. Traps on condensate receiving floor drains above grade.
 - 1. Wrap traps on hub and floor drains per (Part 2.01-I). Insulation shall be cut and formed to the contours of the hub and wrapped around pipe. Factory adhesive shall be used to seal the mitered joints and connection.
- E. Storage tanks
 - 1. Hot water storage tanks shall be wrapped with semi-rigid fiberglass board as per (Part 2.01-J). Wrap the insulation around the tank to verify the length to be joined for an overlap. Cut the insulation and strip off a 3" wide strip for the overlap. Wrap the insulation around the tank and verify that the insulation is butted. Attach the 3" wide overlap with outward clinching staples spaced 3 inches O.C. Cut neatly for all penetrations and seal off any tears, joints or staples with ASJ jacket tape of same materials.
- F. Hot water piping below grade
 - 1. Underground hot water pipe and fitting shall use the following schedule of sizes (see Part 3.02-A).
 - 2. Provide Foamglass insulation for underground hot water piping as per (Part 2.01-F). Underground piping insulation shall be applied over a clean dry surface. Provide 22 gage galvanized wire at 12" O.C. Cover impregnated felt and stagger joints at midpoint. Apply sealant at joints, laps and seams. Secure felt with wire at 12" O.C. with 22 gage galvanized wire. Apply tack coat over felt at not less than 4 gal. per 100 square feet. Embed cloth membrane into wet tack coat. Smooth membrane to avoid wrinkles and overlap seams at least 2". Apply a finish coat at 8 gallons per 100 square feet making certain that membrane is fully covered. Allow 8 hours of drying time before any piping is covered.
 - 3. Underground fittings shall be installed as described above. Provide materials as per (Part 2.01-G).
- G. Cold, hot water, hot water re-circulating and non-potable water piping above exterior grade exposed and concealed.
 - 1. Above grade exterior cold and hot water shall be insulated with Foamglass as per (Part 2.01-D). Fittings shall be as in (Part 2.01-E).
 - 2. Piping

All insulation shall be applied over a clean dry surface. Factory provided laps of ASJ tape of same type as jacket on insulation shall be used on butt joints. All laps and penetrations shall be sealed with a vapor barrier mastic finish.

- 3. Fittings Fitting insulation shall be covered with two coats of vapor barrier mastic with an intermediate layer of glass fabric.
- 4. All above grade exterior piping shall be covered with aluminum jacketing. Aluminum shall be applied to a clean dry surface. Overlap butt joints 4" and apply 1/2" wide bands of aluminum on 8" O.C. and at each end of fittings. On exterior piping, the longitudinal seam shall be located at the bottom center of piping and turned 1/4" down for a drip edge. All joints on exterior piping shall be made water tight with suitable silicone caulking. Caulking is to be applied to joints prior to bands being installed.
- H. All interior exposed piping and fittings located in manufacturing areas, mechanical rooms, etc. below 8'0" AFF shall be wrapped with aluminum jacketing as per (Part 2.02-C and D). Provide 1/2" wide aluminum bands located at a maximum of 8" O.C.

3.03 MISCELLANEOUS

- A. This contractor will contact the engineer prior to start of all phases of work as follows:
 - 1. Installation of underground insulation.
 - 2. Exterior above grade installation.
 - 3. Interior insulation installation.
- B. The engineer will ascertain the continuation of work subject to the requirements aforementioned.

END OF SECTION

22 11 10 - 1 DOMESTIC WATER PIPING

SECTION 22 11 10

DOMESTIC WATER PIPING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. The following described work, materials and equipment shall be furnished and installed as shown on the Drawings and as herein specified.
 - 1. All domestic water service and piping to all fixtures and equipment.

1.02 REFERENCES

A. All plumbing installation and fabrication shall be in accordance with applicable State and Local Plumbing Codes.

1.03 SUBMITTALS

- A. Submit catalog data for all materials listed under this section and per basic mechanical requirements. Include submittal data on related specifications also.
- B. Materials installed without review or after rejection shall be replaced by this contractor with acceptable items at the Engineer's direction.
- C. All materials shall be new, without defect, first line quality unless specifically noted or specified otherwise.
- D. The supplier, by submitting, certifies the materials and equipment to be satisfactory for the application involved.
- E. Contractor further agrees that if deviations, discrepancies or conflicts between submittals and specifications are discovered either prior to or after submittals are processed by the engineer, the design drawings and specifications shall control and be followed.

PART 2 PRODUCTS

2.01 DOMESTIC WATER PIPING SYSTEM

- A. Above Grade:
 - 1. Copper Pipe: Type L hard drawn copper per ASTM B-88. Fittings: Wrought copper or cast brass. Joints: Lead-free, tin-silver solder. Pipes greater than 3" shall have flanged connections at ALL valves and equipment.

Notes:

1. Mechanically formed and brazed TEE connections will not be allowed on copper water piping.

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- 2. Copper press fittings on above grade copper piping will be allowed. System shall be Rigid Tool Company "Viega Pro-Press" system ProPress Fittings: Bronze or copper shall conform to the material requirements of ASME B16.18 or ASME B16.22, NSF/ANSI 61-G when used in a potable water systems and ICC LC-1002. Pro-Press fittings shall have either an EPDM, FKM, or HNBR sealing element and Smart Connect (SC) feature. ½-inch thru 2" shall have a press on each side of the sealing element identified by the double press. 2-1/2-inch thru 4-inch shall have a 420 stainless steel grip ring, PBT separator ring, and either EPDM, or FKM sealing element. Sealing elements shall be verified for the intended uses.
- 3. Pro-Press fittings shall not be exposed on finish side of wall.
- D. All solder joints shall be soldered with an approved listed solder. Acid core solder shall not be used.

2.02 DOMESTIC WATER SPECIALTIES

<u>NOTE ALL SPECIALTIES & VLAVES SHALL BE 100% LEAD FREE (regardless of model</u> <u>number indicated).</u>

- A. SA: Water Hammer Arrestors, ANSI A112.26.1; sized in accordance with PDI WH-201, pre-charged suitable for operation in temperature range -100 to 300°F and maximum 250 psig working pressure; Model Z-1700 manufactured by Zurn or approved equal. Replace existing copper air chambers with SA as indicated on plans.
- B. TMV-1: Leonard Model 270-LF-BRKT or 370-LF-BRKT lead free mixing valve with integral check and mounting bracket installed above the lay-in ceiling when available or below sink when lay-in ceiling is not available, below cabinet when cabinet is available, rough bronze finish. Discharge temperature shall be 109°F. Provided at all lavatories and sinks. Model shall be based on quantity of fixtures.
- C. WHB: Narrow Wall Hydrant Box: Woodford model B75, Finish (Chrome, Brass or Polished Brass) to be selected by Architect, all bronze interior parts, replaceable seat washer, vacuum breaker, screwdriver operated stop valve in supply, loose key operated control valve, tamper resistant box and hinged cover, 3/4" inlet connection capable of rotating 360° and 3/4" male hose connection. Install tight to wall and caulk watertight. Coordinate exact location with Architect before installation.
- D. Service valves 1/2" thru 4" shall be full port ¼ turn brass ball valves, two-piece construction, soldered end connection, with PTFE seats and seals, adjustable stem packing gland, stem o-ring and steel handle with vinyl sleeve. 1/2"thru 2" valves shall be pressure rated at 600 psi WOG and 150 psi WSP. 2 1/2" thru 4" valves shall be pressure rated at 600 psi WOG and 125 WSP.

Valves shall be Kitz series AKSZA (code #59), Nibco model S-FP-600 or Stockham model S-255-FB-R-UL-EL.

All ball valves shall be furnished with valve handle extensions.

- E. Valves installed underground for service, isolation or valved and capped pipes for future extension shall be made accessible with a valve box. Install with cast iron valve box with adjustable sleeve and flanged gate as detailed on plans.
- D. Piping inside chase areas shall be supported with bracketing system equal to Sioux Chief Grid Iron series. System shall include but not be limited to a center span bracket, two end bracket clamps and necessary retaining brackets to support the copper piping. Where piping is supported off the vent system, the vent piping shall be bracketed to the inside chase wall. Stainless steel clamps shall be incorporated into the support system when connections are made to the PVC piping.
- E. AP: The Contractor shall furnish access panels not smaller than 8" X 8" for access to concealed valves, traps, dampers, etc. where no other means of access is provided. Access panels shall be all steel construction with no. 16 gauge wall or ceiling and no. 14 gauge panel door with not less than 1/8" insulation secured to inside of the door. Doors shall be supported with concealed hinges and secured with suitable clips and countersunk flush screws. Outside of access panels shall be flush with finished wall or ceilings, except that where panels are located in acoustic tile or paneling, the door shall be recessed to receive adjacent finish material. The Contractor shall determine the final position of each access door and the size to be used. Access panels shall be as manufactured by MILCOR. Fire ratings of access door shall not be less than the surface on which the door is installed. Where locking access doors are required by specifications, doors shall be fitted with a cylinder key lock. Stainless steel is to be used at exterior locations and areas than cannot be painted to match adjacent surface. Finish for other than stainless steel shall be prime coat white, for final paint to be by others. All access panel doors shall have vandal proof hardware. Size of the door to be sufficient for access and service of the trap primer, water hammer arrestor, or other valve access. Access door panel shall be Mifab series UA-A-VP-C or prior approved equal.

PART 3 EXECUTION

3.01 GENERAL

A. Obtain exact centerline rough-in dimensions between partitions or walls from the Architectural Drawings. Work shall be roughed-in so that all exposed piping will be straight and true without bends or off-sets. Water supplies shall connect through walls with stops and chrome plated escutcheons with setscrews.

3.02 DOMESTIC WATER PIPING SYSTEM

- A. Provide a complete system of domestic water piping including interior and exterior work as indicated.
- B. Piping shall be accurately cut to measurements established at the project site, worked into place without springing or forcing, run as directly as possible, run parallel or perpendicular to building lines, located as indicated on the Drawings and supported as specified elsewhere. Parallel piping shall be grouped together as much as practical. Piping shall be supported as high as practical. Piping not located in mechanical rooms shall be concealed unless noted otherwise.
- C. Piping shall be run as directly as possible, avoiding all unnecessary fittings and joints.

Changes in routing of piping due to field conditions shall be at the expense of this Contractor.

- D. Contractor shall provide for expansion and contraction of piping systems. Expansion and contraction of piping shall not impart excess stress or strain on the building, pipe fittings, joints or connections to equipment.
- E. Piping shall be installed with sufficient spacing between fittings, valves, flanges, etc. so as to allow insulation fittings to be installed without trimming or modification.
- F. Provide sleeves for all piping penetrations of grade beams, floors above grade and walls. Sleeves for insulated piping above grade shall be sized for the insulation diameter. Annular space between the insulation and sleeve shall be sealed or fire caulked as detailed on the drawings. Sleeves for piping through walls below grade shall be sized for use of compressible rubber link seals unless noted otherwise.
- G. Piping thru slabs on grade shall be protected with 1/2" thick closed cell flexible foam insulation minimum 6 inches above and below slab. Wrap all pipes below slab in an approved poly jacketing material.
- H. Piping installed below grade shall have a minimum of 24" cover. Pipes shall be coated with two coats of bituminous paint.
- I. Provide solid type stainless steel escutcheon plates at each exposed piping penetration of walls and ceilings and inside cabinets at water and waste penetrations. Escutcheon plates for insulated piping shall be sized for the insulation diameter. Split ring escutcheons will not be allowed. Waste escutcheons inside cabinets or exposed below sinks or lavatories shall be bell type escutcheons sized to cover the hub and fit flush with wall.
- J. All piping shall be installed to allow complete draining, slope as required. Provide drain valves at all low points where fixtures cannot be used to drain piping. Provide hose bibb with 3/4" hose connection, vacuum breaker/backflow preventer and service valve at the water main entrance.
- K. Provide shutoff valves at each branch from main. Provide shutoff valves for each fixture group to minimize interruption of service for maintenance and repair. Provide an exterior main shutoff valve and valve box as indicated on drawings. Provide area shut-off valves as necessary to facilitate testing and isolation of piping where tested and approved pipes are put into service.
- L. Piping thru metal studs shall be isolated from metal to metal contact with plastic bushings specifically designed for the application.
- M. Provide water hammer arrestors on all hot and cold water branch lines. Arrestors shall be sized for the fixture unit load installed on the branch line and shall be accessible for inspection and/or replacement, provide access panels as required. Water hammer arrestors shall be located at the end of the branch line between the last two fixtures served. When the branch line exceeds 20' in length, an additional water hammer arrestor shall be used. Each water hammer arrestor in this case shall be sized for half the total fixture unit load on the branch line and the location of the second water hammer arrestor shall be midway along the branch line. On a branch

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line that serves a single piece of equipment, the water hammer arrestor shall be located as close to equipment as possible.

- N. All stubouts and exposed piping shall be rigidly supported to eliminate movement.
- O. This Contractor shall complete all equipment connections to the domestic water piping system. Provide shutoff valves and unions for each connection.
- P. Connections to water heaters and connections between ferrous and copper pipe shall be made with dielectric unions or flanges. Joints between plastic and metallic pipe shall be made with transition fittings for the specified purpose.

3.03 TESTING

- A. All piping shall be tested before being insulated or concealed in any manner. Where leaks or defects develop, required corrections shall be made and tests repeated until systems are proven satisfactory.
- B. Water piping systems shall be subjected to a hydrostatic test of one hundred twenty five pounds minimum or 1 1/2 times operating pressure whichever is greater. The system shall be proven tight after a twenty-four (24) hour test.
- C. All rainwater leaders, soil waste and vent piping shall be subjected to a hydrostatic test of not less than a 10-foot head. Piping shall be tested for not less than 4 hours, prior to installing fixtures. Underground piping shall be tested before backfilling.
- D. Provide test report in booklet form showing all field test performed to prove compliance with the specified performance criteria. Booklet shall be submitted prior to submitting for final payment. Booklet shall include the following
 - 1. SYSTEM TESTED (sanitary) (domestic water) (rain leaders)
 - 2. Date of test
 - 3. Test medium
 - 4. Persons present
 - 5. Pressure tested
 - 6. Lines tested and location
 - 7. Length of time test pressure was held
 - 8. Pressure drop
 - 9. Water pressure at most remote and highest location
 - 10. Residual chlorine
- E. This Contractor shall conduct all specified tests until approved by the Engineer. All tests shall be repeated until approved by the Engineer. Piping systems shall not be covered or otherwise concealed until tests inspections have been made and approvals obtained. This Contractor shall notify the Engineer four days prior to testing to allow for scheduling.

3.04 STERILIZATION OF DOMESTIC WATER PIPING SYSTEM

A. Thoroughly flush for a minimum of two hours and then drain the domestic water piping prior to sterilizing by the following method or other methods satisfactory to the Engineer and the Authority Having Jurisdiction.
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22 11 10 - 6 DOMESTIC WATER PIPING

- B. Fill piping with a solution containing 50 ppm of available chlorine. Open and close all valves to thoroughly distribute solution thru all piping. Allow solution to stand for 24 hours then test for residual chlorine at the ends of the lines. If less than 25 ppm is indicated, repeat the sterilization process. When tests show at least 25 ppm of residual chlorine, flush out the system until all traces of chlorine are removed. Open and close all valves in system several times during flushing period.
- C. The Engineer reserves the right to test the water again at any time prior to final acceptance of the work and if found to be unsafe bacteriologically, to require the Contractor to rechlorinate the system until the water is proven equal to that supplied by the public system.
- D. Contractor shall arrange for laboratory testing for a bacteriological examination of potable water system at various locations. The samples shall be tested to meet requirement of city and shall not be of less quality than provided by city. Submit copy from testing agency prior to submitting for final payment.
- E. Minor work such as repairs or replacement of single fitting or valve, pre-clean and disinfect by immersion in solution of 300 ppm chlorine for 1 hour.

3.05 FINAL ACCEPTANCE

A. Before final acceptance, the Plumbing Contractor shall furnish a certificate of inspection and final approval from the plumbing Inspector to the Owner and be in accordance with the latest revisions of the applicable codes and the Approved Plumbing Drawings and Specifications. Contractor shall also furnish booklet of test, sterilization compliance and backflow devices certificates.

END OF SECTION

22 13 10 - 1 SANITARY SEWER PIPING SYSTEM

SECTION 22 13 10

SANITARY SEWER PIPING SYSTEM

PART 1 GENERAL

1.01 WORK INCLUDED

- A. The following described work, materials and equipment shall be furnished and installed as shown on the Drawings and as herein specified.
 - 1. All sanitary sewer piping and equipment shown throughout the building and extension of the sanitary sewer to the indicated termination point.

1.02 REFERENCES

A. All plumbing installation and fabrication shall be in accordance with applicable State and Local Plumbing Codes.

1.03 SUBMITTALS

- A. Submit catalog data and shop drawings for all materials and equipment listed under this section and per basic mechanical requirements. Include submittal data on related specifications also.
- B. Materials or equipment installed without review or after rejection shall be replaced by this contractor with acceptable items at the Engineer's direction.
- C. All materials and equipment shall be new, without defect, first line quality unless specifically noted or specified otherwise.
- D. The supplier, by submitting, certifies the materials and equipment to be satisfactory for the application involved.
- E. Contractor further agrees that if deviations, discrepancies or conflicts between submittals and specifications are discovered either prior to or after submittals are processed by the engineer, the design drawings and specifications shall control and be followed.

PART 2 PRODUCTS

2.01 SANITARY SEWER PIPING SYSTEM

Notes:

1. This contractor shall provide/install cast iron pipe at all fire rated assemblies, return air plenums, and ALL kitchen areas below slab grease waste as depicted on drawings, this includes exterior piping extended to grease interceptors, and where indicated on the drawings for sound purposes. All waste piping serving mechanical boilers shall be as cast iron to exterior or as indicated on plans. All grease waste vent piping shall be PVC as specified below unless located in rated walls. This contractor shall coordinate with Architectural and Mechanical drawings.

22 13 10 - 2 SANITARY SEWER PIPING SYSTEM

2. Waste and vent piping installed inside a turned down slab condition at the building perimeter, at column footings, through or under footings or foundation walls shall be

sleeved with schedule 40 cast iron pipe, 2 pipe sizes larger than the sized waste / vent pipe. Coordinate with the Architectural and Structural drawings for locations. Provide relieving arch as detailed on plans, provide 1 inch thick Armaflex insulation around pipe at wall where vent extends up thru CMU to allow for settlement. This shall be provided at ALL wall/foundation penetrations.

- A. Buried, Exterior & Below Slab:
 - 1. Cast Iron Pipe: ASTM A-74 spun service weight. Fittings: Cast iron. Joints: Hub-and-spigot, compression type with ASTM C-564 neoprene gaskets. Piping and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute and listed by NSF International.
 - 2. PVC Pipe and Fittings: Schedule 40 per ASTM D-1785 / ASTM D-2665. Joints: Solvent weld per ASTM D-2855 with solvent per ASTM D-2564. Foam Core will not be allowed on drain, waste and vent systems.
- B. Above Slab, Interior:
 - 1. Cast Iron Pipe: ASTM A-888 spun service weight and Cispi Standard 301. Cast iron fittings and joints shall be no hub. Piping and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute and listed by NSF International. Cast Iron Piping Coupling: Shall be with a type 304 stainless steel shield 28 ga., stainless steel retaining bands with 3/8" worm gear hex head socket and molded one-piece sealing sleeve. Coupling for 1 ½" to 4" pipes shall be 3" width with 4 retaining bands. Couplings for 5" and larger shall be 4" width with 6 retaining bands. Couplings shall be Husky type SD4000, MG Couplings Heavy Duty series or approved equal.

2.02 SANITARY SEWER SPECIALTIES

- A. FD1: Floor Drain: Zurn no. ZN-415B, two-piece cast iron threaded fully adjustable 4" drain body with flashing collar. Install with 7" diameter polished nickel bronze, heel proof strainer, and deep seal trap. Floor drain shall be furnished with a trap primer connection (plugged) and ProSet Systems Trap Guard.B.
- B. WCO: Wall cleanouts: Cast iron piping shall be cast iron ferrules with no-hub joints, cadmium plated cast iron counter sunk plugs and stainless steel or paintable access cover per general notes on drawings. Access panels are only required when labeled WCO/AP on plans.
- C. Trap guard (see floor drains under sanitary specialties): ProSet Systems, Inc, flexible elastomeric PVC material molded into shape of duck's bill, open on top with curl closure at bottom. Compliance: ASME A112.6.3, NSF/ANSI 14, CSA B 79. Coordinate with floor/hub drain being specified and size of throat. Install per manufacturers recommendations.

22 13 10 - 3 SANITARY SEWER PIPING SYSTEM

PART 3 EXECUTION

3.01 GENERAL

- A. Obtain exact centerline rough-in dimensions between partitions or walls from the Architectural Drawings. Work shall be roughed-in so that all exposed piping will be straight and true without bends or off-sets.
- B. All rough-in sanitary sewer piping shall be properly plugged or capped in a manner approved by the Engineer.

3.02 SANITARY SEWER PIPING SYSTEM

- A. Provide a complete system of sanitary sewer drain, waste and vent piping including interior and exterior work as indicated.
- B. Piping up to 2" shall be sloped at least ¼" inch per foot. Piping 3" thru 6" shall be sloped at least 1/8 inch per foot. Piping 8" and larger shall be sloped at least 1/16

inch per foot. Piping below slabs shall not be sloped less than 1/8" per foot regardless of size.

- C. Buried piping below slab and exterior of building perimeter shall be laid in minimum 4 inches of bedding below and 6" above pipe and sloped as specified herein. Bedding shall be accurately and uniformly graded. Bedding shall be crushed stone equal to Alabama Highway Department #9 crushed stone. Bedding shall be free of organic material. Backfill below floor slabs shall be No. 57 crushed stone full depth from top of bedding to bottom of slab.
- D. Provide cleanouts as required by Code and as indicated on the Drawings. Cleanouts for piping 4" and smaller shall be line size. Cleanouts for piping 6" and larger shall be 4". Provide dual exterior cleanouts within 5 feet of building. Interior cleanouts in floors shall be flush with finished floors. Interior cleanouts in walls shall be above the flood level of plumbing fixtures. Exterior cleanouts in unpaved areas and areas paved with other than concrete shall be set in concrete pads flush with finished grade as detailed on the drawings.
- E. Vents through roof shall be a minimum of 3 inches in diameter and shall terminate at least 12 inches above the roof. See plans for other sizes.
- F. This Contractor shall be responsible for locating vents at least 10 feet from Outside Air intakes, offset vents as required.
- G. Drainage piping shall be installed with hubs upstream of each pipe section. Provide reducing fittings where different sizes of pipe are to be connected. Bushings shall not be used. Provide longsweep fittings, sanitary tees and combination wyes with 1/8 bends as applicable.
- G. All rough-in soil, waste, vent and storm piping shall be properly plugged or capped in a manner approved by the Engineer.
- I. Escutcheons shall be provided on wall penetrations as indicated in Section 221110, Domestic Water Piping System.

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- J. Interior wall cleanouts shall have stainless steel wall covers sized for the cleanout and covering the wall opening. Cleanout covers shall be installed flush with the wall.
- K. Back to back water closets shall be installed with double combination wye with 1/8 bend. Double sanitary tees and double fixture fitting shall not be used.

3.03 TESTING

- A. All piping shall be tested before being insulated or concealed in any manner. Where leaks or defects develop, required corrections shall be made and tests repeated until systems are proven satisfactory.
- B. All soil waste and vent piping shall be subjected to a hydrostatic test of not less than a 10-foot head. Piping shall be tested for not less than 4 hours, prior to installing fixtures. Underground piping shall be tested before backfilling.
- C. VENT TEST as required by Engineer:
 - The final test of the completed drainage and vent system shall be visual and in sufficient detail to determine compliance with the provisions of this code except that the plumbing shall be subjected to a smoke test. Where the smoke test is utilized, it shall be made by filling all traps with water and then introducing into the entire system a pungent, thick smoke produced by one or more smoke machines or introducing a white/gray non-toxic smoke emitter. When the smoke appears at stack openings on the roof, the stack openings shall be closed and a pressure equivalent to a 1-inch water column shall be held for a test period of not less than 15 minutes. This method may be used at rough-in prior to gyp board installation for testing vents in lieu of hydrostatic testing at Engineers discretion, except that plugs will be used at stacks to isolate system where traps have not been installed. Contractor should follow Inspection Department required methods and/or procedures should they differ.

3.04 CLEANING

A. At completion of all work, fixtures, exposed materials and equipment shall be thoroughly cleaned.

3.05 FINAL ACCEPTANCE

- A. Before final acceptance, the Plumbing Contractor shall furnish a certificate of inspection and final approval from the plumbing Inspector to the Owner and be in accordance with the latest revisions of the applicable codes and the Approved Plumbing Drawings and Specifications. Contractor shall also furnish booklet of test and backflow devices certificates.
- B. Provide test report in booklet form showing all field test performed to prove compliance with the specified performance criteria. Booklet shall be submitted prior to submitting for final payment. Booklet shall include the following
 - 1. SYSTEM TESTED (sanitary)

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- 2. Date of test
- 3. Test medium
- 4. Persons present
- 5. Pressure tested
- 6. Lines tested and location
- 7. Length of time test pressure was held
- 8. Pressure drop
- 9. TVI per 22 05 00 General Provisions
- 10. Sump pump tested at rated flow
- C. This Contractor shall conduct all specified tests until approved by the Engineer. All tests shall be repeated until approved by the Engineer. Piping systems shall not be covered or otherwise concealed until tests inspections have been made and approvals obtained. This Contractor shall notify the Engineer four days prior to testing to allow for scheduling.

END OF SECTION

SECTION 22 42 10

PLUMBING FIXTURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

Provide all labor, materials, equipment and services required for complete installation of all plumbing fixtures indicated on Drawings and specified herein.

A. All plumbing fixtures, accessories and trims as shown on the Drawings and as herein specified.

1.03 REFERENCES

A. All plumbing installation and fabrication shall be in accordance with applicable State and Local Plumbing Codes.

1.04 SUBMITTALS

- A. Submit catalog data and shop drawings for all materials and equipment listed under this section and per basic mechanical requirements. Include submittal data on related specifications also.
- B. Materials, fixtures, or equipment installed without review or after rejection shall be replaced by this contractor with acceptable items at the Engineer's direction.
- C. All materials, equipment, and appliances shall be new, without defect, first line quality unless specifically noted or specified otherwise.
- D. The supplier, by submitting, certifies the materials and equipment to be satisfactory for the application involved.
- E. Contractor further agrees that if deviations, discrepancies or conflicts between submittals and specifications are discovered either prior to or after submittals are processed by the engineer, the design drawings and specifications shall control and be followed.

PART 2 PRODUCTS

2.01 PLUMBING FIXTURES – GENERAL

A. Provide all plumbing fixtures complete with trim required, and connect in a manner conforming to the Local, State, International Building Codes, and manufacturers recommendations. Certain fixtures may be furnished by others under other sections of these Specifications. Provide rough-in and final connections including all valves, traps, specialties, etc. required.

B. Provide traps for all waste connections where not furnished with the equipment and stop cocks or valved shut-offs for all water connections to all sinks and other items of equipment. All exposed pipe and metal, including that within cabinets, shall be chrome plated cast brass

with the same gauge thickness as the specified trap. Stainless steel bell escutcheons shall be installed covering the hub connections below sinks and lavatories and extend to the wall or back of cabinet for a tight fit.

- C. Quality and Type of Fixtures
 - 1. Plumbing fixtures, carriers, etc. are specified by manufacture and model numbers for the purpose of establishing type and quality. Equals must be pre-approved by the Engineer. Pre-approval submittals must be received by this office no later than 10 working days before the job bids. (The following additional item/manufacturers are approved:

2.02 FIXTURE SCHEDULE

- P1 Water Closet (ADA Accessible): Kohler Highcrest K-4302, 16-1/2" high, 1.60 gal/flush, white, floor mounted, elongated, top spud, 2-1/4" fully glazed trap-way & bolt caps. Install with Olsonite model 95SSCT solid plastic open front seat with stainless steel self-sustaining check hinge. Flush valve shall be Sloan Royal model 8111-1.60 GPF manual flush valve, cast wall flange with set screw, and solid ring pipe support. Mount the flush valve handle/operator with the supply for a manual operator on the wide side of the room or stall. Provide Urethane reinforced wax bowl ring with sleeve. Provide offset closet flange where required with adjustable stainless-steel ring. Confirm/adjust rough-in dimensions as required per Architectural drawings and elevations.
- P2 Water Closet: Kohler Highcrest K-4406, 15" high, 1.28 gal/flush, white, floor mounted, elongated, top spud, 2-1/4" fully glazed trap-way & bolt caps. Install with Olsonite model 95SSCT solid plastic open front seat with stainless steel self-sustaining check hinge. Flush valve shall be Sloan Royal model 8111-1.60 GPF manual flush valve, cast wall flange with set screw, and solid ring pipe support. Mount the flush valve handle/operator with the supply for a manual operator on the wide side of the room or stall. Provide Urethane reinforced wax bowl ring with sleeve. Provide offset closet flange where required with adjustable stainless-steel ring. Confirm/adjust rough-in dimensions as required per Architectural drawings and elevations.
- P3 Urinal (ADA Accessible): Kohler model K-5016-ET, 0.5 gpf, white, vitreous china, wall hung siphon jet action with bolt caps. Install with Sloan Royal model 186-0.5-YK manual flush valve, cast wall flange with set screw, and solid ring pipe support. Fixture carrier shall be Zurn Z1222 dual plate carrier. Rim of urinal shall be 17" maximum above floor. Confirm/adjust rough-in dimensions as required per Architectural drawings and elevations.
- P4 Urinal: Kohler model K-5016-ET, .5 gpf, white, vitreous china, wall hung siphon jet action with bolt caps. Install with Sloan Royal model 186-0.5-YK manual flush valve, cast wall flange with set screw, and solid ring pipe support. Fixture carrier shall be Zurn Z1222 dual plate carrier. Rim of urinal shall be 22" maximum above floor. Confirm/adjust rough-in dimensions as required per Architectural drawings and elevations.
- P5 Lavatory: (ADA Accessible): (ADA Accessible): Kohler Caxton Oval K-2209, white vitreous china, undermount, 17"x14"" with overflow drain. Provide faucet & trim, faucet

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shall be Kohler K-7515 electronic faucet with mixer, single hole, vandal resistant aerator, 0.50 GPM, polished chrome finish. McGuire grid drain, 17 gauge cast brass chrome plated trap with cleanout & McGuire 2165LK supplies with stops. Provide a TMV-1 Powers LM495-LF mixing valve below counter/apron when available. Discharge temperature shall be 109°F. Insulate the water and waste pipes below the lavatory with Plumberex Pro-Extreme series molded vinyl covering, white finish with reusable snap clip fasteners. Mounting height shall be as directed by the Architect. Mounting height shall be as directed by the Architect.

P6 Existing Electric Water Cooler, Remove, protect, and reinstall existing water cooler as required to meet ADA requirements. Provide Install with 17-gauge cast brass chrome plated trap and Zurn model Z8802-LR-PC supply and stop. Anchor the cooler firmly to the wall at top and bottom with anchor bolts. Confirm/adjust rough-in dimensions as required per Architectural drawings and elevations.

PART 3 EXECUTION

3.01 GENERAL

- A. Obtain exact centerline rough-in dimensions between partitions or walls from the Architectural Drawings. Work shall be roughed-in so that all exposed piping will be straight and true without bends or off-sets. Water supplies shall connect through walls with stops and chrome plated escutcheons with setscrews. Where fixtures are without supporting legs or carriers secure wall hangers to bolts welded to 3/16" steel plates, mounted against walls within chases.
- B. Where backs of fixtures join wainscoting or tile, they shall be ground flat and the joints made close. Run bead of white caulking compound around back of fixture at outside edge before final setting. When fixture is set, wipe compound so that joint is sealed. Remove excess compound with solvent. Caulking compound shall be Porter "Brilliant White", Pittsburgh Glass, Sherwin-Williams, or equal.
- C. All rough-in sanitary sewer piping shall be properly plugged or capped in a manner approved by the Engineer.
- D. Mount fixtures to the heights above finished floor as indicated on the Architectural drawings.

3.02 ADJUSTING

- A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.
- B. Operate and adjust disposers, hot-water dispensers and controls. Replace damaged and malfunctioning units and controls.
- C. Adjust water pressure at faucets and flushometer valves to produce proper flow and stream.
- D. Replace washers and seals of leaking and dripping faucets and stops.
- E. Install fresh batteries in sensor-operated mechanisms.

3.03 CLEANING

- A. At completion of all work, fixtures, exposed materials and equipment shall be cleaned with manufacturers' recommended cleaning methods and materials. Perform the following:
- B. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.
- C. Remove sediment and debris from drains.
- D. After completing installation of exposed, factory-finished fixtures, faucets, and fittings, inspect exposed finishes and repair damaged finishes.

3.04 **PROTECTION**

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Architect/Engineer.

3.05 FINAL ACCEPTANCE

A. Before final acceptance, the Plumbing Contractor shall furnish a certificate of inspection and final approval from the plumbing Inspector to the Owner and be in accordance with the latest revisions of the applicable codes and the Approved Plumbing Drawings and Specifications. Contractor shall also furnish booklet of test, sterilization compliance and backflow devices certificates.

END OF SECTION

SECTION 23 05 00

GENERAL PROVISIONS FOR MECHANICAL

PART 1 GENERAL

1.01 DESCRIPTION

A. The other Contract Documents complement the requirements of this Section. The General Requirements apply to the work of this Section.

1.02 SCOPE OF WORK

- A. The Work shall include the furnishings of systems, equipment, and materials specified in this Division and as required by Contract Documents to include: supervision, operation, methods, and labor for the fabrication, installation, start-up, and tests for the complete mechanical installation.
- B. Work shall include all additional worked required to drain existing hydronic systems as well as all valves, piping and chemicals required to isolate existing system from required system being installed to flush and clean hydronic piping. Any temporary pumping systems will be included in contractor bid price as well.
- C. Drawings for the Work are diagrammatic, intended to convey the scope of the Work and to indicate the general arrangement and locations of the Work. Because of the scale of the Drawings, certain basic items such as pipe fittings, access panels, and sleeves may not be shown. This Contractor shall be responsible for selecting the equipment to fit the space provided. The location and sizes for ductwork, pipe fittings, sleeves, inserts, and other basic items required by code and other sections shall be coordinated and included for the proper installation of the work.
- D. Equipment Specification may not deal individually with minute items required such as components, parts, controls, and devices which may be required to produce the equipment performance specified or as required to meet the equipment warranties. Where such items are required, they shall be included by the supplier of the equipment, whether or not specifically called for in the Contract Documents.
- E. Where the words "provide", "furnish", "include", or "install" are used in the Specification or on the Drawings, it shall mean to furnish, install, and test complete and ready for operation, the items mentioned. If an item is indicated in the Contract Documents, it shall be considered sufficient for including same in the work.
- F. Where noted on the Drawings or where called for in other Sections of the Project Manual, the Contractor for this Division shall install equipment furnished by Others, and shall make required service connections. Contractor shall verify with the supplier of the equipment the requirements for the installation.
- G. Coordinate with all trades in submittal of shop drawings. Shop drawings shall be prepared clearly indicating all applicable components. Space conditions shall be detailed to the satisfaction of all concerned trades, subject to review and final acceptance by the Engineer. In the event that the Contractor installs his work before coordinating with other trades or so as to

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cause any interference with work of other trades, the necessary changes shall be made in the work to correct the condition, at no additional cost to the Owner.

1.03 CODES AND STANDARDS

A. Conform to latest edition of governing codes, ordinances, or regulations of city, county, state, or utility company having jurisdiction. Where local codes are not applicable, conform to current International Plumbing Code; International Mechanical Code; International Fire Code, NFPA and International Electrical Code.

1.04 CONTRACTOR'S QUALIFICATIONS

- A. The qualifications of the Contractor for this project shall be as follows:
 - 1. The Contractor shall have been in the contracting business for the last five (5) consecutive years and under their current corporation name with 75% of the same corporate officers.
 - 2. The Contractor shall have successfully completed at least two projects of comparable size and scope within the past five (5) years.
 - 3. The Contractor's main office shall be located within 100 miles driving distance of the project. If the Contractor's office is located more than 100 miles from job site, the Contractor shall submit for approval, 10 working days prior to bidding the job, the name of the service company within a 100 mile radius of the job site, who will be responsible for any/all service required during the warranty period. In either case, the Contractor shall be responsible for having a qualified technician on the job site within 4 hours after receiving a service call.
 - 4. Contractor must provide a performance and payment bond for their portion of the work.
 - 5. When requested, the Contractor shall provide substantiating proof of these requirements.

1.05 FEES, PERMITS, AND INSPECTIONS

- A. Secure all permits and pay all fees required, including aid to construction, in connection with the Work.
- B. If there is a boiler included as a part of the project, the contractor shall obtain a State Boiler Permit. The permit application form may be obtained on line at http://www.alalabor.state.al.us/PDFs/11-07_Revised/Boiler_Install_Permit_Rev_112807.pdf.
- C. Coordinate and provide such inspections as are required by the Authorities with jurisdiction over the site.
- **D.** Where applications are required for procuring of services to the building, prepare and file such application with the Utility Company. Furnish all information required in connection with the application in the form required by the Utility Company.

1.06 ACTIVE SERVICES

A. Existing active services; water, gas, sewer, electric, are to be located and shall be protected against damage. Do not prevent or disturb operation of active services which are to remain. If

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active services are encountered which require relocation, make request to authorities with jurisdiction for determination of procedures. Where existing services are to be abandoned, they shall be terminated in conformance with requirements of the Utility or Municipality having jurisdiction.

1.07 SITE INSPECTION

- A. Contractor shall inspect the site to familiarize himself with conditions of the site which will affect his work and shall verify points of connection with utilities, routing of outside piping to include required clearances from any existing structures, trees or other obstacles.
- B. Extra payment will not be allowed for changes in the Work required because of Contractor's failure to make this inspection.

1.08 OPENINGS, CUTTING, AND PATCHING

- A. Coordinate the placing of openings in the new structure as required for the installation of the Mechanical Work.
- B. When additional patching is required due to failure to inspect work; then provide the patching required to properly close the openings, to include patch painting.
- C. When cutting and patching of the structure is made necessary due to failure to install piping, ducts, sleeves, or equipment on schedule, or due to failure to furnish, on schedule, the information required for the leaving of openings, then provide the cutting and patching as required.

1.09 WIRING FOR EQUIPMENT

- A. Division 26 shall provide power services for motors and equipment furnished by this Contractor to include safety disconnect switches, starters and final connections.
- B. Division 23 shall provide all motors and contactors for equipment furnished under this Division, except where they are an integral part of a motor control center which is provided under another Division.
- C. Provide internal wiring, alarm wiring including for fire protection and/or security, control wiring, and interlock wiring for equipment furnished, to include temperature control wiring.
- D. Coordinate with Division 26 all motors and other mechanical equipment which require electrical services. Provide schedule which shall include the exact location for rough-in, electrical load, size, and electrical characteristics for all services required.
- E. Where motors or equipment furnished require larger services or services of different electrical characteristics than those called for on the Electrical Drawings, this contractor shall coordinate with the electrical contractor and the Electrical Engineer to provide a larger service as required, the cost of which shall be the responsibility of this contractor.
- F. Electrical work provided under Division 23 shall conform to the requirements of Division 26.

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1.10 SUBSTITUTIONS

- A. Any equipment submitted as "equal" to the basis of design shall be accompanied with a comparison letter from the vendor stating any differences from the equipment being submitted and the basis of design. A letter is also to be submitted from the vendor, on the vendor's letterhead, stating that the vendor has received a copy of the job specifications, all addendums and any necessary drawings.
- B. Substitutions for the scheduled and specified equipment shall only be done with the prior approval of the engineer, and shall be obtained in writing. Prior approvals shall be obtained no less than ten working days prior to the bid date. Prior approval shall not relieve the contractor of supplying equipment that meets the specifications, capacities, efficiencies, physical dimensions, etc.

1.11 PROTECTION

- A. Special care shall be taken for the protection of equipment furnished. Equipment and material shall be completely protected from weather elements, painting, plaster, etc. until the project is completed. Damage from rust, paint, scratches, etc. shall be repaired as required to restore equipment to original condition.
- B. Where the installation or connection of equipment requires work in areas previously finished by other Contractors, the area shall be protected and not marred, soiled, or otherwise damaged during the course of such work. Contractor shall arrange with the other Contractors for repairing and refinishing of such areas which may be damaged.
- C. When welding is required inside the building, provide one man for a fire watch. Fire watch shall require adequate protection of existing surfaces and observance of lower floors where penetrations exist.

1.12 SUBMITTALS

- A. General
 - 1. Submit to Engineer shop drawings and product data required by the drawings and specifications.
 - 2. Contractor shall compile all data including but not limited to ductwork materials and construction details, ductwork layout, manufacturers catalog and product data, controls wiring diagrams and material data, piping, insulation, water treatment, and test and balance.
 - 3. Submit a minimum of 7 copies of data, more if required by the Architect.
- B. Submittal Requirements
 - 1. Prepare submittals compiled in a 3 ring, hard bound, loose leaf binder. The face of the binder shall be clearly marked with the project title and number, the name of the Owner, Architect, Engineer, General Contractor and this contractor.
 - 2. The first page inside the binder shall provide an index, numerically indicating all sections applicable to this submittal.

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- 3. Separate binders shall be provided for HVAC.
- 4. Provide tab dividers for each section submitted. In the event an item appears on the drawings not specifically covered by the specifications, provide an additional numeric tab at the end of the index detailing the item and include the submittal data in the binder.
- 5. All equipment included on the submittal sheets shall be marked to indicate the "Tag" name or number of the equipment as shown on the drawings. The equipment shall be high-lighted, where necessary, to clarify which items are being submitted.
- 6. For the ductwork submittals, the contractor will be provided with an electronic copy of the mechanical floor plans. Ductwork layout submittals shall consist of one digital copy in .dwg format. The drawing's layout sheet sizes shall be formatted to 24" x 36" or 30" x 42". A digital copy in PDF format shall be returned to the contractor with the Engineer's approval stamp and comments.
- 7. Submit only complete project submittals. Partial submittals or submittals not complying with the above requirements shall be returned to the contractor un-marked and rejected.
- 8. In the interest of project expediency the contractor may pre-submit long lead items for pre-approval. However, the contractor shall not be relieved of including the same data as required by submittal binder and shall be included therein.
- 9. The Contractor may turn in submittals without control drawings if they require a longer production time. All other items shall be included.
- 10. Provide a tab for items not included and include an explanation of why item is not included in the submittal and the expected submittal date.
- 11. Review shop drawings and product data prior to submission to Engineer.
- 12. Verify field measurements, field construction criteria, catalog numbers, and similar data.
- 13. Coordinate each submittal with work of the project and Contract Documents.
- 14. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Engineer's review of submittals, unless Engineer gives written acceptance of specific deviations.
- 15. Notify Engineer in writing of deviations from requirements of Contract Documents at time submittals are made. A "deviation" shall be construed to mean a minor change to the sequence indicated on drawings or specification. A "deviation" is not intended to allow substitutions or product options.
- 16. Do not begin work which requires submittals until submittals have been returned with Engineer's stamp and initials or signature indicating review and approval. Materials and equipment that were installed prior to being not approved shall be removed and replaced with approved items at no additional cost to other parties.
- 17. Shop Drawings and/or submittals requiring resubmission to the Engineer due to noncompliance with the Contract Documents and/or incompleteness shall be thoroughly reviewed by the Contractor prior to delivery to the Engineer for review. The Contractor shall ensure the completeness and compliance of the submittal materials and shall

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reimburse the Engineer at their standard hourly billing rates for review of submittals/shop drawings beyond the second submission.

- 18. Attention is directed to the fact that Engineer's review is only to check for general conformance with the design concept of the project and general compliance with Contract Documents. No responsibility is assumed by Engineer for correctness of dimensions, details, quantities, procedures shown on shop drawings or submittals.
- 19. Omission in shop drawings of any materials indicated in Contract Drawings, mentioned in Specifications, or required for proper execution and completion of Work, does not relieve the Contractor from responsibility for providing such materials.
- 20. Approval of a separate or specified item does not necessarily constitute approval of an assembly in which item functions.

1.13 OPERATING AND MAINTENANCE MANUALS

- A. General
 - 1. Provide searchable CD in PDF format of all product data, and other information described in this Section for use in compiling operating and maintenance manuals.
- B. Compilation
 - 1. The Contractor will receive shop drawings, brochures, materials lists, technical data of all types, warranties, guarantees, and other pertinent information and will assemble, catalog, and file information in loose-leaf, hardback three-ring binders.
 - 2. Submittal Format: (Provide each of the following items, as applicable, for each required item or system. Requirements will vary, depending on the equipment. Refer to specific Specification section requirements.)
 - a. Item: (Use appropriate Section title.)
 - b. System Description: (Provide a detailed narrative description of each system, describing function, components, capacities, controls and other data specified, and including the following:
 - (1.) Number of.
 - (2.) Sizes.
 - (3.) Type of operation.
 - (4.) Detailed operating instructions, including start-up and shut-down of each system, with indications for position of all controls, as applicable.
 - (5.) Wiring Diagrams: (Complete wiring diagrams for internally wired components including controls.)
 - (6.) Operating Sequence: (Describe in detail.)

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- (7.) Manufacturers Data: (Provide catalog data sheets, specifications, nameplate data and parts list.)
- (8.) Preventative Maintenance: (Provide manufacturer's detailed maintenance recommendations.)
- (9.) Trouble Shooting: (Provide manufacturer's sequence for trouble-shooting procedures for operational problems.)
- (10.) Extra Parts: (Provide a listing of extra stock parts furnished as part of the Contract.)
- (11.) Warranties: (Provide specific manufacturer's warranty. List each component and control covered, with day and date warranty begins, date of expiration, and name, address and telephone number of person to contact regarding problems during warranty period.)
- (12.) Directory: (Provide names, addresses and telephone numbers of Contractor, its subcontractors, suppliers, installers and authorized service and parts suppliers. Format as follows:)
 - Contractor: Address: Telephone No.: Person to Contact:
 - Subcontractor: Address: Telephone No.: Person to Contact:
 - Installer: Address: Telephone No.: Person to Contact:

Manufacturer: Address: Telephone No.: Person to Contact:

Local Service Representative: Address: Telephone No.: Person to Contact:

1.14 RECORD DRAWINGS

- A. Detailed Requirements for Record Drawings
 - 1. During the progress of the work, the Contractor shall require the job superintendent for the air conditioning, heating, and ventilating subcontractors to record on their field sets of

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drawings the exact locations, as installed, of all conduits, pipes, and ducts whether concealed or exposed which were not installed exactly as shown on the contract drawings.

- 2. Upon completion of the work this data shall be recorded to scale, by a competent CAD operator in an electronic drawing file in DWG format of no more than two versions past current. Electronic drawings in DWG format will be furnished to the Contractor by the Architect/Engineer. Where the work was installed exactly as shown on the contract drawings the DWG file shall not be disturbed other than being marked "As-Built". In showing the changes the same legend shall be used to identify piping, etc., as was used on the contract drawings. Separate electronic drawings shall be prepared for heating, air conditioning, and ventilating work unless two or more divisions are shown on the same sheets of the contract drawings, in which case the various subcontractors shall also show their changes on the same sheets. Each sheet shall bear the date and name of the subcontractor submitting the drawings.
- 3. The Contractor shall review the completed As-Built drawings and ascertain that all data furnished on the DWG files are accurate and truly represent the work as actually installed. Where hot or chilled water pipes, inverts etc., are involved as part of the work, the Contractor shall furnish true elevations and locations, all properly referenced by using the original bench mark used for the institution or for this project. The DWG files, including those unchanged and changed, shall be submitted to the Engineer on a CD-R disc.
- 4. The Contractor shall submit as-built drawings to the Engineer for review.
- 3. The Engineer shall authorize the Contractor to produce and distribute the as-built drawings as follows:
 - a. One (1) Computer Disc (CD) to the Engineer.
 - b. One (1) CD to the Architect.
 - c. Three (3) hard copies full size
 - d. Two (2) CD to the Owner.

1.15 SUBSTITUTIONS AND PRODUCT OPTIONS

- A. For products specified only by reference standard, select product meeting that standard, by any manufacturer.
- B. For products specified by naming several products or manufacturers, select any one of products and manufacturers named which complies with specifications.
- C. For products specified by naming several products or manufacturers and stating "or equivalent", "or equal", or "or Engineer approved equivalent", or similar wording, submit a request for proposed substitutions for any product or manufacturer which is not specifically named; for review and approval by the Engineer.
- D. For products specified by naming only one product and manufacturer, there may be an option of an Engineer approval of a product of equal or greater quality or size.

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1.16 SUBSTITUTION SUBMISSIONS

- A. Contractor's Base Bid shall be per contract documents.
- B. Submit separate request for each substitution. Support each request with:
 - 1. Complete data substantiating compliance of proposed substitution with requirements stated in contract documents:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature; identify:
 - (1.) Product description.
 - (2.) Reference standards.
 - (3.) Performance and test data.
 - c. Name and address of at least two similar projects on which product has been used, and date of each installation.
 - d. Itemized comparison of the proposed substitution with product specified; list significant variations.
 - e. Data relating to changes in construction schedule.
 - f. Any effect of substitution on separate contracts.
 - g. List of changes required in other work or products.
 - h. Designation of availability of maintenance services, sources of replacement materials.
 - i. Provide certification of product compatibility with adjacent materials.
- C. Substitutions will not be considered for acceptance when:
 - 1. They are indicated or implied on shop drawings or product data submittals without a formal request from Contractor or his supplier prior to bid.
 - 2. Acceptance will require substantial revision of contract documents.
 - 3. In judgment of Engineer, do not include adequate information necessary for a complete evaluation.
 - 4. Substitute products shall not be ordered or installed without written acceptance of Engineer.
 - 5. Engineer will determine acceptability of proposed substitutions.

1.17 CONTRACTOR'S SUBSTITUTION RESPONSIBILITIES

- A. In making formal request for substitution, Contractor represents that:
 - 1. He has investigated proposed product and has determined that it is equivalent to or superior in all respects to that specified.
 - 2. He will provide same warranties or bonds for substitution as for product specified.
 - i. He will coordinate installation of accepted substitution into the work, and will make such changes as may be required for the work to be complete in all respects. This includes revisions due to changes in electrical characteristics, physical size and weight, service requirements, service clearances, etc.
 - 3. He waives claims for additional costs caused by substitution which may subsequently become apparent.
- B. The contractor shall have included all costs associated with the substitution for the specified products or materials, and that no additional cost will be incurred by any other party in order to fully incorporate the substituted item(s).
- C. The contractor agrees to reimburse the Architect/Engineer for any architectural or engineering re-design that is required by the substitution to be fully incorporated. The reimbursement shall be at the Architect/Engineer's standard billing rate.

1.18 ENGINEER DUTIES

- A. Review Contractor's requests for substitutions with reasonable promptness.
- B. Notify Contractor in writing of decision to accept or reject requested substitution.

1.19 CONTRACTOR DUTIES

A. When the Contractor schedules an inspection for the Engineer, all work for that inspection, i.e., above ceiling, shall be completed. If the work is not complete and not ready for inspection, the Engineer will notify the Contractor that the inspection was not performed. The Contractor shall complete the work, and then re-schedule the inspection for the Engineer, for which the Contractor shall reimburse the Engineer at their normal hourly billing rates.

1.20 FINISHING

- A. General: Prior to acceptance of the installation and final payment of the Contract, the Contractor shall perform the work outlined herein.
- B. Cleaning: At the conclusion of the construction, the site and structure shall be cleaned thoroughly of all debris and unused materials remaining from the mechanical construction. All closed off spaces shall be cleaned of all packing boxes, wood frame members, and other waste materials used in the mechanical construction.
- C. The entire system of piping and equipment shall be cleaned internally. The Contractor shall open all dirt pockets and strainers, completely blowing down as required and clean strainer screens of all accumulated debris.

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- D. All tanks, fixtures, and pumps shall be drained and proven free of sludge and accumulated matter.
- E. All temporary labels, stickers, etc., shall be removed from all fixtures and equipment. (Do not remove permanent name plates, equipment model numbers, ratings, etc.). All HVAC equipment shall have affixed adjacent to the permanent nameplate, the unit identification on an engraved label with permanent adhesive.
- F. Heating and air conditioning equipment, tanks, pumps, etc., shall be thoroughly cleaned and new filters or filter media installed.

1.21 TEST AND DEMONSTRATIONS

- A. Systems shall be tested and placed in proper working order prior to demonstrating systems to Owner.
- B. Prior to acceptance of the mechanical installation, demonstrate to the Owner or his designated representatives all essential features and functions of all systems installed, and instruct the Owner in the proper operation and maintenance of such systems. The contract shall allow for five (5) working days to perform the demonstrations.
- C. Provide necessary trained personnel to perform the demonstrations and instructions. Provide manufacturer's representatives for systems as required to assist with the demonstrations.
- D. Dates and times for performing the demonstrations shall be coordinated with the Owner.
- E. Upon completion of demonstrations, provide a certificate testifying that demonstrations have been completed. Certificate shall list each system demonstrated, dates demonstrations were performed, names of parties in attendance, and shall bear signatures of contractor and owner.
- F. Training shall include audio/video recording in DVD format turned over to the owner as part of closeout documents.

1.22 PAINTING AND IDENTIFICATION

- A. Touch-up paint where damaged on equipment furnished with factory applied finish, to match original finish.
- B. Provide engraved, laminated plastic tags for all equipment. Tags shall be attached with permanent adhesive.

1.23 EXCAVATING, TRENCHING, AND BACKFILLING

A. Provide excavation necessary for underground water piping, etc., and backfill such trenches and excavations after work has been installed and tested. Care shall be taken in excavating, that walls and footings and adjacent load bearing soils are not disturbed, except where lines must cross under a wall footing. Where a line must pass under footing, the crossing shall be made by the smallest possible trench to accommodate the pipe. Excavation shall be kept free from water by pumping if necessary. No greater length of trench shall be left open, in advance of pipe and utility laying, than that which is authorized.

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- B. Trenches for piping and utilities located inside foundation walls and to point five (5) feet outside of the wall shall be not less than sixteen (16) inches or more than twenty-four (24) inches wider than the outside diameter of the pipe to be laid. The widths of trenches for piping and utilities located more than five (5) feet outside of building foundation walls, other than for sewers, shall be governed by conditions found at the site.
- C. Bottoms of trenches shall be so shaped that when pipe is in place the lower fourth of the circumference for the full length of the barrel will be supported on compacted fill. Bell holes shall be dug so that no part of the weight of the pipe is supported by the bell but shall be no larger than necessary for proper jointing. All sewers and piping required for the structure shall be excavated to at least (6) inches below pipe invert.
- D. Immediately after testing and/or inspection, the trench shall be carefully backfilled with earth free from clods, brick, etc., to a depth one-half the pipe diameter and then firmly puddled and tamped in such a manner as not to disturb the alignment or joints of the pipe. Thereafter, the backfill shall be puddled and tamped every vertical foot.

1.24 CONCRETE WORK

- A. Provide concrete bases and housekeeping pads for mechanical equipment unless indicated otherwise. Concrete work shall be as specified in the applicable Civil/Site and Structural Sections. Vibration pads, equipment bases, pipe supports and thrust blocks shall be provided by this Contractor.
- B. Provide equipment anchor bolts and coordinate their proper installation and accurate location.

1.25 ACCESS PANELS

A. Provide access panels where required and not shown on the drawings for installation by the drywall or masonry Contractor. Access panels shall be as specified in the applicable architectural section. All access panel locations which allow access to mechanical equipment shall be approved by the Architect/Engineer.

1.26 SLEEVES

- A. Sleeves passing through non-fire rated walls and partitions shall be Schedule 10 black steel.
- B. Sleeves passing through load bearing walls, concrete beams, foundations, footings, and waterproof floors shall be Schedule 40 galvanized steel pipe or cast iron pipe.
- C. Sleeves passing through non-load bearing walls, concrete beams, foundations, footings, and waterproof floors shall be Schedule 40 PVC or cast iron.
- D. Sleeves for insulated piping shall be of sufficient internal diameter to take pipe and insulation and to allow for free movement of pipe. Waterproof sleeves shall be of sufficient internal diameter to take pipe and waterproofing material.
- E. In finished areas where pipes are exposed, sleeves shall be terminated flush with wall, partitions, and ceilings, and shall extend 1/2" above finished floors. Extend sleeves 1" above finished floors in areas likely to entrap water.

F. Pipe to wall penetration closures for underground pipe penetrations of walls shall be "Link-Seal" as manufactured by Thunderline Corporation, or equal.

1.27 ESCUTCHEONS

A. Provide chrome plated escutcheons at each sleeved opening into finished and stainless steel to exposed exterior spaces. Escutcheons shall fit around insulation or around pipe when not insulated; outside diameter shall cover sleeve. Where sleeve extends above finished floor, escutcheon shall be high cap type and shall clear sleeve extension. Secure escutcheons or plates to sleeve but not to insulation with set screws or other approved devices.

1.28 INSULATION PROTECTION

A. Where exposed insulated piping extends to floor, provide an aluminum sheet metal guard around insulation.

1.29 ANCHORING OF EQUIPMENT

A. All equipment located on floor slab, that is not mounted on wheels and is capable of being moved shall be secured to the floor with anchor bolts. A minimum of two bolts are required per each piece of equipment and bolts shall be of sufficient size to prevent equipment from overturning.

1.30 PROTECTION OF ELECTRICAL EQUIPMENT

A. Water piping shall not be installed in electrical rooms, communication rooms or directly above electrical equipment.

1.31 CONNECTIONS FOR FIXTURES AND EQUIPMENT UNDER ANOTHER SECTION OR BY OWNER

- A. Rough all equipment requiring connection to systems provided under this Division. Verify requirements and current locations before proceeding with work.
- B. Make all connections to equipment furnished under another Section or by owner as required to obtain complete and working systems.

1.32 SYSTEM GUARANTEE

- A. Work required under this Division shall include one-year guarantee from substantial completion of all parts and labor. Guarantee by Contractor to Owner to replace for Owner any defective workmanship or material which has been furnished under contract at no cost to the Owner for a period of one year from date of substantial completion. Guarantee shall also include all reasonable adjustments of system required for proper operation during guarantee period. Guarantee shall <u>not</u> include normal preventative maintenance services or filters.
- B. At "Demonstration", one-year guarantee provision by Contractor shall be explained to Owner.
- C. All sealed hermetic refrigeration systems shall be provided with five-year factory warranty from date of substantial completion.

END OF SECTION

SECTION 23 05 05

MECHANICAL DEMOLITION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Remove: Equipment, piping, insulation, controls, ductwork, etc. as indicated on the drawings.

1.02 EXISTING CONDITIONS

- A. Contractor shall visit site prior to bidding; the contractor shall become familiar with the requirements and intent of the drawings.
- B. There will be no allowances made for failure of the contractor to familiarize themselves with the extent of work required under the specifications or drawings.

1.03 SALVAGED MATERIALS OR EQUIPMENT

- A. Equipment and materials shall be removed from the jobsite at no additional expense to the owner.
- B. All equipment indicated on the drawings shall be turned over to the owner.
- C. Any material posing a hazard shall be removed from the jobsite immediately.

PART 2 - EXECUTION

2.01 GENERAL

- A. Contractor shall submit a plan for approval by the Architect for phasing of demolition to minimize utility outages and interference with other trades and occupied portions of the building.
- B. Contractor shall coordinate utility outages with the General Contractor, Owner and Architect by providing three days written notice of times and locations of utility outages and anticipated time of restoration.

2.02 PROTECTION OF EXISTING TO REMAIN

- A. Provide tarps, plywood, and any other protectionary devices to protect existing finishes, furniture, appliances, equipment, etc.
- B. Damages to any afore mentioned shall be replaced by this contractor at no cost to the owner.

2.03 PROHIBITED METHODS

A. Jack Hammers shall not be used without the written approval of the Architect. The Architect reserves the right to withdraw approval for the use of jack hammers at any time if their use create excessive noise and/or vibration as deemed by the Architect.

- B. Explosives of any type shall not be used.
- C. Burning shall not be used as a means of demolition and/or disposal. Cutting torches shall not be considered as burning.

2.04 DUST CONTROL

A. Provide tarps, temporary walls, etc. as required to prevent the spread of dust through the building unnecessarily.

END OF SECTION

SECTION 23 05 32

SUPPORTS AND ANCHORS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Pipe, duct, and equipment hangers, supports, and associated anchors.
- B. Equipment bases and supports.
- C. Sleeves and seals.
- D. Flashing and sealing equipment and pipe stacks.

1.02 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

A. Furnish hanger and support inserts sleeves to Section for placement into formwork.

1.03 SUBMITTALS

- A. Submit shop drawings and product data for all items listed under this section.
- B. Indicate hanger and support framing and attachment methods.

PART 2 PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

- A. Hangers for Pipe Sizes 1/2 to 4 inches: Carbon steel, adjustable, clevis type with galvanized plating.
- B. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods; cast iron roll and stand for hot pipe sizes 6 inches and over.
- C. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
- D. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp; adjustable steel yoke and cast iron roll for hot pipe sizes 6 inches and over.
- E. Vertical Support: Steel riser clamp with galvanized plating.
- F. Floor Support for Pipe Sizes to 4 Inches and All Cold Pipe Sizes: Cast iron adjustable pipe saddle, locknut nipple, floor flange, and concrete pier or steel support anchored to floor.
- G. Un-insulated Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- H. Shield for Insulated Piping 1 1/4 Inches and Smaller: 18 gage galvanized steel saddle over insulation in 180 degree segments, minimum 12 inches long per pipe support.
- I. Shield for Insulated Water Piping 1 1/2 Inches and Larger: Rigid non-conducting insulation in 180 degree segments, 16 inch minimum length with block thickness the same as insulation thickness and with an inner contour of the supporting pipe. Install with 16 gage galvanized steel saddle per pipe support. See Detail for additional requirements. Wood is not an acceptable blocking material.
- K. Shields for Vertical Copper Pipe Risers: Sheet lead.

2.02 HANGER RODS

A. Steel Hanger Rods: Galvanized threaded both ends, threaded one end, or continuously threaded.

2.03 FLASHING

- A. Metal Flashing: galvanized steel.
- B. Lead Flashing: 5 lb/sq ft sheet lead for waterproofing; one lb/sq ft sheet lead for soundproofing.
- C. Flexible Flashing: 47 mil thick sheet butyl; compatible with roofing.
- D. Caps: Steel, 20 gage minimum; 16 gage at fire resistant elements.

2.04 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: Form with schedule 80 PVC or Schedule 10 steel pipe.
- B. Sleeves for Pipes Through Non-fire Rated Walls, Footings, and Potentially Wet Floors: Form with schedule 10 steel pipe.
- C. Sleeves through beams shall be Schedule 40 steel; only in locations approved by the Structural Engineer.
- D. Sleeves for Round Ductwork: Form with galvanized steel. Size shall include an allowance for the insulation.
- E. Sleeves for Rectangular Ductwork: Formed or framed for the duct penetration including scheduled/specified insulation. See Detail for packing insulation and metal flashing
- F. Flanges shall be 20 gage galvanized steel.
- G. Sleeves for floor or wall penetrations at rated assemblies shall conform to Specifications Section 23 05 60.

2.05 FABRICATION

- A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- B. Design hangers without disengagement of supported pipe.

2.06 FINISH

- A. Prime coat steel hangers and supports at interior spaces. Exterior supports shall be galvanized or primed and painted as directed by Engineer and Architect.
- B. Finish coat in exposed areas and exterior shall be selected by Architect.

PART 3 EXECUTION

3.01 PIPE HANGERS AND SUPPORTS

A. Support horizontal piping as follows:

PIPE SUPPORT SCHEDULE					
Pipe	Support Spacing				Hanger Rod
Size	Sched 40	Copper	PVC	Cast Iron	Diameter
	Black Steel			Soil Pipe	
1/2"	-	5'-0"	4'-0"	-	3/8"
3/4"	7'-0"	5'-0"	4'-0"	-	3/8"
1"	7'-0"	6'-0"	4'-0"	-	3/8"
1-1/4"	7'-0"	7'-0"	4'-0"	-	3/8"
1-1/2"	9'-0"	8'-0"	4'-0"	-	3/8"
2"	10'-0"	8'-0"	4'-0"	5'-0"	3/8"
2-1/2"	10'-0"	9'-0"	4'-0"	5'-0"	1/2"
3"	10'-0"	10'-0"	4'-0"	5'-0"	1/2"
4"	10'-0"	10'-0"	4'-0"	5'-0"	5/8"
6"	10'-0"	10'-0"	4'-0"	5'-0"	3/4"
8"	10'-0"	10'-0"	4'-0"	5'-0"	7/8"
10"	10'-0"	10'-0"	4'-0"	5'-0"	7/8"

Note: Rods may be reduced one size for double rod hangers, with 3/8" being the minimum diameter.

- B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- C. Place a hanger within 12 inches of each horizontal elbow.
- D. Use hangers with 1-1/2 inch minimum vertical adjustment.
- E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
- G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- H. Support riser piping independently of connected horizontal piping.
- I. All hangers, hanger rods, supports, etc. shall be double nutted.

3.02 EQUIPMENT BASES AND SUPPORTS

- A. Provide equipment bases of concrete type.
- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct support of steel members. Brace and fasten with flanges bolted to structure.
- D. Provide rigid anchors for pipes after vibration isolation components are installed.

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3.03 FLASHING

- A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Flash vent and soil pipes projecting 3 inches minimum above finished roof surface with lead worked one inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counterflash and seal. Coordinate with Roofing Contractor PRIOR to any work as required to ensure roof warranty as roof systems may vary.
- C. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp device.
- D. Seal floor, and mop sink drains watertight to adjacent materials.
- E. Provide acoustical lead flashing around ducts and pipes penetrating equipment rooms, installed in accordance with manufacturer's instructions for sound control.

3.04 SLEEVES

- A. In finished areas where pipes are exposed, sleeves shall be terminated flush with wall, partitions, and ceilings, and shall extend 1/2" above finished floors. Extend sleeves 1" above finished floors in areas likely to entrap water. Caulk sleeves full depth and provide floor plate.
- B. Install chrome plated steel escutcheons at finished surfaces.
- C. Install stainless steel escutcheons at finished exterior surfaces.

END OF SECTION

SECTION 23 05 60

THROUGH PENETRATION FIRE STOPPING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Provide fire stopping for the ALL through penetrations:
 - 1. Hydronic piping
 - 2. Refrigerant piping
 - 3. Conduit for wiring and controls
 - 4. Ductwork, except where not required to meet UL listing due to fire damper.

1.02 REFERENCES

- A. Underwriters Laboratories (UL)
- B. American Society for Testing and Materials (ASTM)

1.03 CONTRACTOR REQUIREMENTS

A. This work shall be performed by a contractor trained in the installation or application of systems similar in complexity to those required for this project. The contractor shall have at least 2 years experience with through penetration fire stopping systems and shall have completed a least 5 comparable scale projects using these systems.

1.04 SUBMITTALS

- A. Product data including the following:
 - 1. Manufacturers specifications and technical data
 - 2. Detailed specification of construction and fabrication installation instructions
- B. Shop drawings
 - 1. For each standard application of penetration item and surface being penetrated provide a manufacturers UL approved system cut sheet identifying the UL system number, UL classified devices or materials to be used, other materials to be used, anchorages, sleeves, annular space requirements and sizes, dimensions and locations of all items.
 - 2. For each non-standard application, provide a manufacturer's qualified engineering judgment and drawing. The drawing shall indicate those items specified in "1.1A" above.
 - 3. All UL approved systems shall be selected based on their "F" rating. All systems shall provide the same ratings as the rating of the floor or wall being penetrated, as shown on the plans.
- C. Qualifications
 - 1. Provide list of past projects indicating past experience.

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2. Provide statement from manufacturer that installer has to be trained in the proper method of installing fire stop systems.

D. Guarantee

Submit copies of written guarantee agreeing to repair or replace joint sealers which fail in joint adhesion, co-adhesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability or appear to deteriorate in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated. The guarantee period shall be one year from date of substantial completion.

1.05 STORAGE

A. Coordinate delivery with scheduled installation date, comply with manufacturers maximum storage requirements. Store materials in a clean, dry, ventilated location. Protect from soiling, abuse, moisture and freezing.

1.06 PROJECT CONDITIONS

- A. Contractor shall review Architectural plans prior to bid, to verify wall and floor types to be penetrated. Fire ratings of walls are indicated on the plans. Ratings of the floors are assumed to be two (2) hours unless otherwise indicated on the Architectural Plans.
- B. Contractor shall coordinate with the other trades for any penetrating items (pipe, conduit, etc.) that have to be routed differently than shown on the plans. Contractor shall provide fire stopping for all rerouted items whether different UL approved systems or additional materials are required.

PART 2 PRODUCTS

2.01 THROUGH PENETRATION FIRE STOPPING

- A. Acceptable manufacturers and products shall be those listed in the UL fire resistance directory for the UL system involved.
- B. All systems and devices shall be asbestos free.
- C. Systems or devices listed in the UL. Fire resistance directory under categories XHCR and XHEZ may be used, providing that it conforms to the construction type, penetration type, annular space requirements and fire rating involved in each separate instance and that the system be symmetrical for wall applications.
- D. Fill, void or cavity materials shall be as classified under category XHHW in the UL fire resistance directory.
- E. Forming materials shall be as classified under category XHKU in the UL fire resistance directory.
- F. All fire-stopping products shall be from a single manufacturer.

PART 3 EXECUTION

3.01 GENERAL

A. Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

23 05 60 - 3 THROUGH PENETRATION FIRE STOPPING

- B. Verify barrier penetrations are properly sized and in suitable condition for application of materials.
- C. Do not proceed until unsatisfactory conditions have been corrected.
- D. Clean surfaces to be in contact with penetration seal materials, of dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting, adhesion, or the required fire resistance.

3.02 INSTALLATION

- A. Install penetration seal materials in accordance with printed instructions of the U.L. Fire Resistance Directory and in accordance with manufacturer's instruction.
- B. Where floor openings without penetrating items are more than four inches in width and subject to traffic or loading, install fire stopping materials capable of supporting same loading as floor.
- C. Protect materials from damage on surfaces subject to traffic.
- D. Place rock wool or other approved non-flammable material in annular space around fire dampers before installation of damper's anchoring flanges, which are installed in accordance with fire damper manufacturers' recommendations.
- E. Where large openings are created in walls or floors to permit installation of pipes, ducts, cable tray, bus duct or other items, close unused portions of opening with fire stopping material tested for the application. See U.L. Fire Resistance Directory and Section 2.01 of this document.
- F. Where rated walls are constructed with horizontally continuous air space, double width masonry, or double stud frame construction, provide vertical, 12 inch wide fiber dams for full thickness and height of air cavity at maximum 15 foot intervals.

3.03 ADJUSTING AND CLEANING

- A. Clean up spills of liquid components.
- B. Neatly cut and trim materials as required.
- C. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

3.04 FIELD QUALITY CONTROL

- A. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.
- C. Perform under this section patching and repairing of fire stopping caused by cutting or penetration by other trades.

END OF SECTION

SECTION 23 05 90

TESTING, ADJUSTING AND BALANCING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Provide all labor, equipment and instrumentation necessary to perform the testing, adjusting and balancing (TAB) of heating, ventilating and air conditioning (HVAC) systems which shall include, but not be limited to:
 - 1. Chilled water supply and return systems
 - 2. Hot water supply and return systems
 - 3. Condenser water supply and return systems
 - 4. Glycol-water systems
 - 5. Supply air systems
 - 6. Return air systems
 - 7. Exhaust air systems
 - 8. Outside air
 - 9. Mixed air
 - 10. Adjustment of controls and equipment as required for proper operation of systems
 - 11. Air leakage testing of ductwork
 - 12. Heat transfer equipment
 - 13. Adjust all systems to maintain building pressure design

1.02 REFERENCES

- A. Associated Air Balance Council (AABC)
- B. National Environmental Balancing Bureau (NEBB)
- C. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
- D. Sheet Metal and Air Conditioning Contractor's Association (SMACNA)

1.03 CONTRACTOR'S QUALIFICATIONS

- A. The TAB Contractor shall be an independent contractor from the Mechanical Contractor.
- B. The TAB Contractor shall be certified by either AABC or NEBB.

1.04 THE TAB AGENDA

- A. The TAB Contractor shall prepare a TAB agenda for review and approval by the Engineer. The TAB Agenda shall be provided during the submittal process. The TAB Contractor shall not commence work until the TAB Agenda has been approved by the Engineer.
- B. The Agenda shall include the following detailed narrative procedures, system diagrams and

forms for test results.

- 1. Specific standard procedures required and proposed for each system. Additional procedures for variable flow systems shall be developed by the TAB Contractor and included for review and approval.
- 2. Specific test forms for recording each TAB procedure and additional test forms for any variable flow systems shall be developed by the TAB Contractor and submitted for review and approval.
- 3. System diagrams for each air and water system. Diagrams may be single line. In addition to the information recorded for standard AABC or NEBB procedures, report the following information:
 - a. Air handling units: Prepare profile and show design and actual CFM (outside air, return air, supply air). Measure and record each mode (minimum OA and 100% OA) where economizer cycle is specified. Record pressure drops of all components (coils, heat recovery devices, filters, sound attenuators, louvers, dampers, fans) and compare with design values. Pressure profile and component pressure drops are performance indicators and are not to be used for flow measurements. Set and record purge air flow for heat recovery wheels. Record temperatures of outside air, return air, mixed air and supply air.
 - b. Duct distribution systems: Prepare pressure profiles from the air handling units to the extremities of the system. As a minimum, show pressures at each floor, main branch, and air flow-measuring device. Make pitot tube traverses of all trunk lines and major branch lines where required for analysis of distribution system. Air flow measuring devices installed in ductwork may be utilized. Record residual pressures at inlet of volume controlled terminals at ends of system. Show actual pressures at all static pressure control points utilized for constant or variable flow systems.
 - c. Variable flow systems (air and water): Include specific test forms provisions for measuring and reporting CFM (supply, return, exhaust, outside), GPM (primary, secondary), system pressures, motor loads, other pertinent data, at full unthrottled capacity and at design (100 percent) flows. Record additional flow, pressure, and motor loads for supply and return/exhaust system capacities in 10 percent increments down to a minimum attainable by the system to verify fan tracking and control. Modulate Systems by varying the supply temperature of the medium or other approved means.
 - d. Water systems: Record system fill pressures and expansion tank (level, pressure, and temperature) conditions. Record shut-off heads for all pumps and compare with pump curves to determine if correct pump impellers have been installed. Record entering and leaving water temperatures for all coils, chillers, boilers, heat exchangers, cooling towers, etc., and the ambient temperatures for all chillers, boilers, cooling towers, etc.
- 4. Specific test forms for recording sound and vibration measurements.

1.05 SUBMITTALS

A. The TAB Contractor shall submit the following items prior to commencing work. All submittals shall be bound in a binder complete with cover sheet, index, and tabs separating specific sections of the submittal.

- 1. The TAB agenda as detailed in paragraph 1.03-A
- 2. Warranty information
- 3. TAB Contractor qualifications including TAB Engineer and company experience on similar projects
- 4. Submit project supervisor and qualifications
- 5. Submit TAB equipment and last date of calibration
- B. After completion of all TAB procedures and before warranty period commences, submit complete test reports as provided for by the prior approved TAB agenda, for Engineer review and approval. Where test results differ from specified design conditions, indicating a contract deficiency, include explanatory comments and possible resolutions in the report. After review by the Engineer, the TAB Contractor shall make any adjustments deemed necessary by the Engineer.
- C. Final report shall be submitted for acceptance and record. Submit six (6) copies of final reports.

1.06 WARRANTY

- A. For a period of one year after substantial completion, the TAB Contractor shall, at the request of the Engineer, return to the project to retest and/or rebalance any problem areas. This shall be done within ten (10) working days at no additional expense to the Owner or the Engineer. The purpose of this is to correct a problem, not to retest/rebalance revisions made by the Owner.
- B. During the first year after acceptance by the Owner, the TAB Contractor shall return to the project during the peak heating and cooling seasons to rebalance the applicable hydronic systems to maintain the required discharge air and water temperatures. The TAB report shall be amended to reflect the results.

1.07 COMMISSIONING

A. TAB will be responsible to carry out the commissioning requirements specified in Section 23 99 50, Section 01 91 13 and other sections referenced in 01 91 13.

PART 2 EQUIPMENT (NOT APPLICABLE)

PART 3 EXECUTION

3.01 GENERAL

- A. The TAB Contractor shall review and become thoroughly familiar with the job site when the erection of the building is in the early stages. An additional visit shall be made when the rough-in is complete. Prior to any closing in of ductwork and piping, verify that all fittings, dampers, control devices, test devices and valves are properly located and installed.
- B. The TAB Contractor shall examine each air and hydronic distribution system to verify that it is free from obstructions. The TAB Contractor shall determine that all dampers, registers and valves are in a set or full open position; that strainers are clean; that moving equipment is lubricated; and that the required filters are clean and functioning. The TAB Contractor shall request that the installing contractor perform air adjustments necessary for proper functioning of the system.

- C. The TAB Contractor shall use test instruments that have been calibrated within a time period recommended by the manufacturer (no more than 6 months) and have been checked for accuracy prior to the start of the testing, adjusting and balancing.
- D. The TAB Contractor shall verify that all equipment performs as designed and specified. The TAB Contractor shall adjust all variable type drives, volume dampers, control dampers, balancing valves, control valves, etc., as required by the TAB work.
- E. Coordinate TAB procedures with all construction requirements for the project so that usable increments of finished work may be accepted for beneficial occupancy. Systems serving partially occupied phases of the project may require balancing for each phase prior to final balancing.
- F. Allow sufficient time in construction schedule for TAB prior to final inspection for the project.
- G. Conduct final TAB after system has been completed and is in full working order. Put all HVAC systems into full operation and continue operation of the systems during each working day of TAB. Accomplish TAB in accordance with the Agenda approved by the Engineer.

3.02 AIR BALANCE

- A. Place all interactive systems in operation with all filters installed and automatic control systems completed and operating. Artificially load air filters by partial blanking or other means to produce air pressure drop midway between the clean and dirty condition. Set/reset room thermostats as necessary to check heating and cooling function, and maximum/minimum flow rates for factory set air terminal units and adjust units if not correct.
- B. Balance systems to design ratings. Adjust fan speeds to provide design flows, including system diversities, at actual system pressures. Coordinate with mechanical contractor to provide additional sheaves and belts as required to achieve design CFM. Coordinate VAV balancing, including supply and return fan volume controls, with the controls Contractor and set supply fan static pressure control as low as practicable and still maintain required pressure at the remote terminal units.
- C. Make pitot tube traverses of all trunk lines and major branches when required to determine proper proportioning of air flows. Air flow measuring devices, where installed, may be utilized for this purpose.
- D. Record pressure drop readings across all major system components and significant drops within duct systems.
- E. Adjust air systems with doors leading outside closed. Balance individual rooms simulating occupied conditions. (Windows and doors closed, etc.)
- F. Log air flows for occupied and unoccupied conditions.
- G. Make flow and pressure measurements at each terminal device, and each supply, return, or exhaust diffuser. Adjust each air outlet unit within plus or minus 10 percent of design requirements, but total air for each system shall be not less than shown. Adjust grilles and diffusers to minimize drafts in all areas. Maintain the building pressure relationships between different zones.
- H. Adjust outside air and return air quantities for all systems to within plus or minus 10 percent. Total supply air quantity for any system shall be not less than shown.
- I. Adjust exhaust systems to CFM requirements.
- J. Test function of automatic dampers and operation of air terminal units. Check all controls for proper operation.
23 05 90 - 5 TESTING, ADJUSTING, AND BALANCING

3.03 HEAT TRANSFER EQUIPMENT DATA

A. For all heat transfer equipment, which for the purposes of this specification section shall include coils, chillers, boilers, heat exchangers, cooling towers, evaporative coolers, humidifiers, etc.

The following data shall be measured and included in the TAB report:

- 1. Ambient conditions, dry bulb, wet bulb, relative humidity
- 2. Entering air wet bulb and dry bulb
- 3. Entering relative humidity
- 4. Leaving air wet bulb and dry bulb
- 5. Leaving air relative humidity
- 6. Entering water temperature
- 7. Leaving water temperature
- 8. Water flow
- 9. Air pressure drops (inches) and water pressure drops (feet)

3.04 AIR LEAKAGE TESTING OF DUCTWORK

A. Ductwork leakage shall be tested in accordance with SMACNA manual, "HVAC Air Duct Leakage Test Manual", latest edition.

3.05 HYDRONIC BALANCE

- A. Perform final hydronic balance after all systems have been flushed, cleaned, and filled.
- B. Hydronic balance includes performance readings on all pumps, coils, heat exchangers, and flow measuring devices. Adjust pump flows to actual system heads by adjustment of balancing valves. Flow measuring devices take precedence over pump head readings. Record discrepancies for evaluation.
- C. Report pressure drop readings across all major system components both for flow determination and deviations between actual and design values.
- D. Record on flow diagrams the flows and pressures obtained in each of the various circuits and modes of operation. Designate the manual rebalancing effort that is necessary for optimum operations. Measure flows in primary and secondary pumping systems when operating independently and jointly. Measure and record flows and power consumption of variable flow systems at maximum flow conditions and in increments of 10 percent reductions to a minimum system condition.

END OF SECTION

SECTION 23 07 10

DUCTWORK INSULATION

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Work of this section shall include providing the thermal insulation for mechanical systems and shall include the following principal items:
 - 1. Supply, Return, Outside, and Relief Air ductwork concealed.
 - 2. Supply, Return, Outside, and Relief Air ductwork exposed.
 - 3. Supply, Return, Outside, and Relief Air ductwork concealed outside of building insulation envelope attic/crawlspace.
 - 4. Exhaust Air ductwork concealed.
 - 5. Exhaust Air ductwork exposed.
 - 6. Lined ductwork.
 - 7. Exterior exposed ductwork.
- B. Not all of the insulation types specified herein may be required on this project. The contractor is only to provide those insulation types required for the applications on this project.
- C. This work shall be performed by a competent insulation contractor whose primary business is the installation of insulation systems and who has been in this business for a minimum of five years.

1.02 SUBMITTALS

A. Submittals and product literature for each insulation type, finish type, and equipment served. Provide submittals on method of installation for each type of insulation used.

1.03 DEFINITIONS

- A. The following definitions apply to this specification section only and are intended to help clarify insulation applications:
 - 1. Concealed: above ceilings, in attics or crawlspaces and in spaces not accessed easily through a door.
 - 2. Exposed: visible from an occupiable space that is easily accessible through a door. This would include mechanical rooms.
 - 3. Interior: inside the exterior building skin, not exposed to weather.

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- 4. Exterior: outside of the exterior building skin, exposed to weather.
- 5. Outside of building insulation: inside of the exterior building skin, protected from the weather, but in an un-insulated space that is not heated or cooled.

PART 2 PRODUCTS

2.01 THERMAL INSULATION

- A. All insulating systems shall be tested on a composite basis in accordance with NFPA and UL 723 and shall have a maximum flame spread rating of 25 and a maximum smoke developed rating of 50 under ASTM E-84.
- B. Insulation Types:
 - 1. FIBERGLASS BLANKET

Made of flame - attenuated glass fibers, bonded with a thermosetting resin. Reinforced with fiberglass scrim facing laminated to UL rated kraft. FSK facing, .02 perms, .00035" foil thickness per ASTM E-96, procedure A. 2" thick, 0.75 PCF, 6.9 R value. Equal to CertainTeed SoftTouch Type 75.

2. RIGID FIBERGLASS

3 lb. density, .23 k factor. Inorganic glass fibers bonded by a thermosetting resin with an FSK jacket in compliance with NFPA 90A AND 90B standards. Equal to CertainTeed CertaPro CB300, 3 lb density, 8.7 R value, 2" thick with FSK jacket.

3. FIBERGLASS BLANKET

Made of flame - attenuated glass fibers, bonded with a thermosetting resin. Reinforced with fiberglass scrim facing laminated to UL rated kraft. FSK facing, .02 perms, .00035" foil thickness per ASTM E-96, procedure A. 3" thick, 3/4 lb., 10.4 R value. Equal to CertainTeed SoftTouch Type 75.

4. SEMI RIGID FIBERGLASS BOARD

2-1/2 lb. density, thermal conductivity compliance ASTM C 518, 850 degrees F temperature limit, 1 1/2" thick. High temperature fiberglass bonded to a flexible jacketing. Jacketing is a laminate of white kraft and aluminum foil, reinforced with fiberglass, chemically treated for fire and smoke safety. Equal to Certainteed CrimpWrap.

5. DUCT LINER

Acoustical and thermal insulation manufactured from long textile, type glass fibers firmly bonded together with a thermosetting resin. Air stream surface is coated to protect against air erosion. Up to 250 degrees F (ASTM C 411), NFPA 90A and 90B, ASTM C 1071. Air stream surface to contain an EPA registered antimicrobial agent to aid in the prevention of fungal and bacterial growth and shall not promote or support the growth of mold, fungi or bacteria. Equal to Certainteed ToughGard Duct Liner, Type 150, 1" thick, 0.28 K value for up to 6,000 FPM velocity.

23 07 10 - 3 DUCTWORK INSULATION

6. RIGID FIBERGLASS

3 lb. density, .23 k factor. Inorganic glass fibers bonded by a thermosetting resin with a white ASJ jacket in compliance with NFPA 90A AND 90B standards. Equal to CertainTeed CertaPro CB300, 3 lb density, 1" thick.

C. Aluminum Jacket

1. Embossed aluminum, 0.016 inch thickness, equal to Pabco.

D. Duct Tape

- 1. FSK, glass fiber impregnated with foil facing, 4"wide, 25/50, ASTM E-84.
- 2. Same as number 1 except with a white ASJ jacket.

E. Adhesives

- Water based adhesives for attaching low density fibrous insulation and duct liner to metal. Service temperature limits-20 degrees F to 250 degrees F, UL MJAT-2, ASTM C 916, type 11, NFPA 90A and 90B. Equal to Foster Quick Tack Adhesive 85-60. Adhesive not to support mold or mildew growth.
- 2. Spray adhesive for attaching embossed aluminum jacket to exterior applied insulation.

F. Caulking

1. Caulking shall be 100% silicone color matched to embossed aluminum jacket.

PART 3 EXECUTION

3.01 WORKMANSHIP

- A. All materials shall be applied by Workmen skilled in this trade. Unsightly work shall be cause for rejection.
- B. Mechanical fasteners shall be used whenever possible to assure permanent construction.
- C. Materials shall be applied only after systems have been tested and all surfaces are clean and dry.
- D. All insulation of cold surfaces shall be vapor sealed. All joints, laps, breaks and faults in vapor barriers of insulation covering cold surfaces shall be thoroughly sealed.
- E. Insulation that becomes wet for any reason shall be removed, replaced and resealed at the expense of this Contractor.

3.02 APPLICATION

A. Interior, Concealed Square or Round Ductwork

23 07 10 - 4 DUCTWORK INSULATION

Use FIBERGLASS BLANKET as per Part 2, 2.1, B-1. For square ducts with any one dimension not greater than 24". Insulation shall be wrapped around ducts and secured with outward clinching staples at 4 inches o.c. Ducts 24 inches and greater shall have insulation additionally secured with stick clips on 18 inch centers or with 4 inch wide bands of adhesive applied on 18 inch centers. Insulation shall be lapped a minimum of 4" and all seams and penetrations shall be sealed with FSK Duct tape as per Part 2, 2.1, D-1.

B. Rectangular, Interior Supply, Return, Outside Relief and Exhaust Air Ductwork, Exposed.

Use FIBERGLASS BOARD insulation as per Part 2, 2.1, B-6, and shall be applied to ducts with mechanical fasteners such as stick cups or weld pins at 12 inch centers. Install fiberglass board in full pieces. Joints and seams shall be covered with 4" tape as per Part 2, 2.1, D-1. Where standing seams or angle supports exceed insulation thickness an additional layer of board will be used.

C. Round, Interior Supply, Return, Outside, Exhaust and Relief Ductwork Exposed.

Round ductwork use SEMI RIGID FIBERGLASS BOARD as per Part 2, 2.1, B-4. Flexible fiberboard shall be applied to ducts with outward clinching staples. Make any fabrication cuts to accommodate the proper fitting of the insulation before stapling. Joints, seams and any penetrations shall be sealed with matching tape.

D. Exterior, Exposed Ductwork

Use RIGID FIBERGLASS BOARD as per Part 2, 2.1, B-2.

- 1. Apply board with mechanical fasteners such as stick clips or weld pins with retainers spaced as required to assure contact between insulation and metal.
- 2. Cover Insulation with embossed aluminum jacket. Attach jacket to insulation using spray adhesive.
- 3. For ducts smaller that 24", joints in the jacket shall occur at the corners of the duct. Screws shall be installed at the edge of the jacket and installed thru the insulation to the duct.
- 4. On ducts 24" and greater provide "Z" strips between adjacent insulation sections to attach the jacket to using short screws.
- 5. On transverse jacket seams the jacket shall be overlapped a minimum of 2" and screwed together using short screws.
- 6. Jackets located higher on the ducts shall overlap the lower jackets.
- 7. Provide corner flashing fabricated out of the same aluminum material to cover corner joints and screws. Corner flashings shall be broken.
- 8. Caulk all seams, joints and overlaps.
- E. Supply, Return, Outside, Relief or Exhaust Ductwork Outside of Building Insulation

Use FLEXIBLE FIBERGLASS INSULATION as per Part 2, 2.1, B-3. Ductwork shall be wrapped and secured with outward clinching staples at 4 inches o.c.. Ducts 24" and wider shall have the insulation additionally secured with stick on clips on 18" centers. Insulation shall be lapped 4" and all seams and penetrations shall be vapor sealed with FSK tape (Part 2, 2.1, D-1).

F. Supply, Return, Outside, Relief and Exhaust Ductwork Indicated on the Plans to be Lined.

Use DUCT LINER (Part 2, 2.1, B-5), and (Part 2, 2.1, E-1). Liner shall be attached to metal using adhesive covering 90% of the metal. All edges of liner facing the direction of airflow

23 07 10 - 5 DUCTWORK INSULATION

and not receiving metal nosing shall be coated with adhesive. Liner shall be neatly butted without gaps at transverse joints and shall be coated with adhesive at such joints.

Liner shall be folded and compressed in the corners of rectangular duct sections or shall be cut and fit to assure butted edge overlapping. Longitudinal joints in duct liner shall not occur except at the corners of ducts unless the size of the duct and standard liner product dimensions make such necessary.

Interior widths of duct not exceeding 8" do not require mechanical fasteners in addition to adhesive.

Interior widths of duct exceeding 8" will require mechanical fasteners as follows:

	Transversely Around	
<u>Velocity</u> 2500 fpm & below	Perimeter At 4" from corners and at intervals not exceeding 12"	Longitudinally At 3" from transverse joints and at intervals not exceeding 18"
2501 fpm to 6000 fpm	At 3"from corners and at intervals not exceeding 6"	At 3" from transverse joints and at intervals not exceeding 16"

Mechanical fasteners will be applied with an approved mechanical fastening system. Hand driven pins with hammers will not be approved. Weld pins or "Grip Nails" or equal.

Longitudinal joints in liner shall be coated with adhesive at velocities over 2500 fpm.

Metal nosing that is either channel or zee profile or is integrally-formed from the duct wall shall be securely installed over transversely oriented liner edges facing the air stream at fan discharge and at any interval of lined duct preceded by unlined duct. In addition, where velocities exceed 4000 fpm metal nosing shall be used on upstream edges of liner at every transverse joint.

Where dampers, turning vane assemblies or other devices are placed inside of lined duct or fittings, the installation must not damage the liner or cause erosion of the liner. The use of metal hat sections or other buildout means is optional; when used, buildouts shall be secured to the duct wall with bolts, screws, rivets or welds.

3.03 MISCELLANEOUS

- A. Ductwork indicated on the drawings to be internally lined shall not be insulated externally unless the ductwork is outside of the building insulation envelope.
- B. All insulating systems described herein shall conform to the latest edition of SMACNA and will comply with NFPA-90A, 90B, 30; TIMA AHC-101; ASTM C390, C167, C553, E84, C177, C423, C411, C916, D903, D93, D1151; ASHRAE; ACGIH; Tested for UL 181.

23 07 10 - 6 DUCTWORK INSULATION

- C. The engineer will reserve the right to accept or reject any and all work not in compliance with the aforementioned. The engineer will be contacted for inspection during any of the following operations:
 - 1. During installation of any ductwork wrapping.
 - 2. During the installation of ductwork that has been lined.

END OF SECTION

23 31 10 - 1 GALVANIZED SHEET METAL DUCTWORK

SECTION 23 31 10

GALVANIZED SHEET METAL DUCTWORK

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide a galvanized sheet metal ductwork system as indicated on the drawings, complete with all accessories specified herein and as required for proper system operation and balance.

1.02 REFERENCES

Air Diffusion Council (ADC)

Air Movement and Control Association (AMCA)

American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE)

National Fire Protection Association (NFPA)

Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

Underwriters Laboratories, Inc. (UL)

1.03 SUBMITTALS

A. Submit catalogue data and shop drawings for all materials and equipment listed under this section.

PART 2 PRODUCTS

2.01 GENERAL

A. All sheet metal ductwork shall be fabricated and installed in accordance SMACNA standards unless more stringent requirements are stated herein.

2.02 GALVANIZED SHEET METAL DUCTWORK

- A. Sheet Metal Ductwork
 - 1. Galvanized steel ductwork shall be carbon steel, of lock-forming quality, hot dip galvanized, with regular spangle-type zinc coating, conforming to ASTM A-527/A527M-G90.
 - 2. In addition to the above, all rectangular ductwork exposed in occupied areas shall also have a paint grip finish that will readily accept a field painted finish. This also applies to all fabricated sheet metal accessories including hangers, drives, etc.
 - 3. Sheet metal gauges and reinforcement shall conform to the latest edition SMACNA HVAC duct construction standards, with the exception that 26 gauge will be the lightest gauge allowed for rectangular ductwork.

4. Round sheet metal ducts shall use the gauges recommended by SMACNA in Tables 3-2A and 3-2B, HVAC Duct Construction Standards, 1998 edition, with the exception that 26 gauge duct shall be the lightest gauge allowed.

2.03 DUCTWORK SEALANT

- A. Sealant shall be non-flammable when wet, fire resistive when dry, and suitable for use in high velocity ductwork. Shall meet NFPA 90A and 90B and be UL classified. Sealant shall have a maximum 25 flame spread and 50 smoke developed (dry state) compound specifically for sealing ductwork.
- B. Tape for use with duct sealant shall be specifically designated by the manufacturer for ductwork sealing.

2.04 DUCTWORK ACCESSORIES

A. General

Provide duct accessories as indicated on the drawings and as required for proper system operation and balance.

B. Flexible Duct Connections

Flexible duct connections shall be UL listed fire retardant neoprene coated woven glass fiber fabric connections, shall conform to NFPA 90A and 90B and have a maximum flame spread rating of 25 and a maximum smoke development rating of 50.

- 1. For static pressures up to 3", flexible connection fabric shall be 22 oz./sq. yard and 3" wide with 3" metal on either side of fabric. Equal to Duro Dyne #10105.
- 2. For static pressures 3" or greater, flexible connection fabric shall be 30 oz./sq. yard and 3" wide with 3" wide metal on either side of fabric. Equal to Duro Dyne #10003.
- C. Manual Balancing Dampers
 - 1. Dampers in round ductwork (low pressure) shall be single blade type with a 20 gauge beaded frame. The blade is to be two layers of galvanized steel with the equivalent thickness of 14 gauge. A neoprene seal shall be sandwiched between the two blades. The damper axle shall be ½" diameter and extend 6" beyond the frame for the damper quadrant or motorized operator and shall be installed in stainless steel or oil impregnated bronze bearings.

The damper shall be Ruskin model CDRS25, American Warming and Ventilating model VC-25 or Air Balance Inc. Model AC-530.

2. Dampers in rectangular ductwork greater than 8" x 10" shall be the opposed blade type, complete with concealed linkage and extended shaft for the damper quadrant or motorized operator, 16 gauge frame and double skin airfoil blades with the equivalent thickness of 14 gauge. The axle is to be ½" plated hex steel with stainless steel or oil impregnated bearings. The blades shall have neoprene edge seals and compression jamb seals.

The damper shall be Ruskin model CD-60, American Warming model VC-27 with optional bronze bearings or Air Balance Inc. Model AC-516 with optional bronze bearings. Dampers listed as $8^{\circ} \times 10^{\circ}$ or smaller shall be single blade.

- 3. All dampers shall have an operable blade area equal to the duct net area. No blank off plates will be allowed in place of non-standard blade widths.
- D. Damper Quadrants

Damper Quadrants shall have indicators showing open and closed positions, and shall be Ventfabrics, "Ventlock", as follows:

- 1. Dampers with shaft length 12" or less No. 620 for base ductwork and No. 637 for insulated ductwork.
- 2. Dampers with shaft length longer than 12" No. 637.
- E. Motorized Dampers
 - 1. Motorized Dampers: Motorized dampers shall be the same as the manual dampers with the addition of a motorized operator, specified as follows:
 - a) Two Position Motorized dampers shall be controlled with Belimo model NF24-S-US, direct coupled, 24 volt, 60 in-lb torque with 75 second run time, spring return and built in auxiliary switch. Actuators shall be factory mounted to the dampers.
 - b) Fully Modulating Motorized dampers shall be controlled with Belimo model NF24-SR-S-US, direct coupled, 24 volt, 60 in-lb torque, spring return and built in auxiliary switch. Actuators shall be factory mounted to the dampers.
- F. Splitter Dampers and Adjustable Volume extractors

Rectangular duct mounted splitter dampers and adjustable volume extractors shall be fabricated form 16-gauge steel with a hemmed leading edge. The trailing edge shall be pivoted on a rod or hinges. Install in accordance with the latest edition of SMACNA's Low Velocity Manual and as detailed on the drawings. Secure rod to leading edge of damper and extend rod through side of ductwork using Ventlock #603 ball joint bracket with set screw.

- G. Turning Vanes
 - 1. All turning vanes shall be double thickness with a 2" radius, installed on runners with 2-1/8" blade spacing. Blades shall be 26 gauge.
- H. Access Doors
 - 1. Duct Access Doors shall be UL labeled, galvanized steel, double panel construction, internally insulated with minimum 1-inch thick fiberglass insulation complete with gaskets.
 - 2. Access doors held in place with sheet metal screws are not acceptable.
 - 3. The location of the access doors shall be coordinated for easy access to the fire damper fusible links.

- 4. The following access doors are specified to establish the quality of the products. Other products by prior approved manufacturers will be considered.
 - Rectangular, low pressure duct.
 United Air, Series ADH, 24 gauge with hinged frame connection and cam lock closures. Doors shall be 16" x 16" or large as possible.
 - b. Rectangular, high pressure duct. Kees Incorporated, Series ADC-HP, 24 gauge galvanized panel, 22 gauge frame with camlock closures on all sides. Provide safety chain.
 - c. Round, low pressure duct. United Air, Series ADC, 22 gauge, spiral compression with conical springs and hand knobs.
 - d. Round, high pressure duct. Ductmate Industries, Inc., sandwich access doors with conical springs and hand wheels.

2.05 45 DEGREE, SQUARE-TO-ROUND TAKEOFF FITTINGS

- A. All branch duct takeoffs to a single air distribution device, shall be made using a rectangular,
 45 degree takeoff that transitions to the round duct size shown on the plans.
- B. The takeoff shall be fabricated from hot dipped galvanized steel sheets of lock forming quality per ASTM-A653. The longitudinal seam shall have a continuous weld for no air leakage at 2" W.G. static pressure.
- C. Takeoff shall have a 1" wide gasketed flange with pre-drilled screw holes.
- D. Sizes 4" through 12" to have a reinforced damper axis with 1/4" regulator. Sizes 14" through 20" to have a 3/8" continuous rod axis.
- E. All sizes shall be fabricated with a damper handle insulation standoff.
- F. Crown Model 3300DS is specified to establish the product quality, equals will be considered.

2.06 INSULATED FLEXIBLE DUCTWORK

- A. Insulated flexible duct shall be listed under UL standard 181 as class 1 air duct and shall comply with NFPA standards 90A and 90B. The duct shall be 25/50 rated for flame spread/smoke developed.
- B. The duct shall be constructed with an acoustically transparent CPE film mechanically locked to a corrosion resistant galvanized steel wire helix.
- C. The duct shall be insulated with a factory applied fiberglass blanket.
 - 1. Insulation R value for duct inside the building insulation envelope shall be R-5.0.
 - 2. Insulation R value for duct outside the building insulation envelope shall be R-8.0.

- D. The vapor barrier shall be a fire retardant, reinforced, metalized outer jacket with a permeance of 0.05 perm.
- E. Flexible ductwork shall be rated for 6 inches W.G. positive pressure and 1 inches W.G. negative pressure through 16" diameter. Flexible duct on sizes greater than 16" shall not be used. The rated temperature range shall be –20 to +200 degrees F. The UL rated velocity shall be 5000 fpm.
- F. Insulated flexible duct shall be Thermaflex Type M-KE, Flexmaster Type 8M or ATCO #039.

2.07 DUCT SUPPORTS

- A. General
 - 1. Duct supports shall be placed within two feet on either side of each elbow.
 - 2. Duct supports shall be placed within four feet on every side of each branch intersection.
 - 3. If spacing of the building structure components is greater than the maximum allowed for duct supports, additional structural members (unistrut, steel angles, etc.) shall be placed to span the building components to provide support points for the ducts.
- B. Rectangular ductwork
 - 1. Rectangular ductwork shall be supported at a maximum of every five (5) feet using a pair of 1" straps fabricated from 20 gauge sheet metal or two-3/8" rods. The supports shall be attached to the duct and the building in accordance with SMACNA standards. This shall apply to all rectangular ducts up to a maximum half of duct perimeter of 120".
 - 2. For ducts with a half of duct perimeter greater than 120", the gauge of the support straps and size of the rods shall be in accordance with SMACNA standards.
- C. Round ductwork
 - 1. Round ductwork up to 36" diameter shall be supported at a maximum of every eight (8) feet using a single 1" strap fabricated from 20 gauge sheet metal or 3/8" rod. The supports shall be attached to the duct and the building in accordance with SMACNA standards.
 - 2. Round ducts greater than 36" diameter, shall be supported by straps or rods sized in accordance with SMACNA standards.
- D. Flexible ductwork
 - 1. Flexible duct shall be supported by materials in accordance with SMACNA or the Flex duct manufacturer's recommendations. Where 90 degree bends occur for duct or diffuser connections are made, the bend shall be reinforced with a Flex Flow Elbow as manufactured by Titus Flex Right Duct accessory or prior approved equal.

23 31 10 - 6 GALVANIZED SHEET METAL DUCTWORK

PART 3 EXECUTION

3.01 GALVANIZED SHEET METAL DUCTWORK

- A. Sheet Metal Ductwork shall be fabricated and installed per the latest edition of the SMACNA HVAC duct construction standards and ASHRAE Handbook.
- B. All ductwork shall be supported in accordance with SMACNA standards. All threaded rod supports shall be double nutted.
- C. Duct transitions shall be gradual, the angle of the side of the transition piece shall not exceed 15 degrees form the straight run of duct extended.
- D. All rectangular duct elbows shall be fabricated in accordance with either of the following:
 - 1. Radius Elbow All radius elbows shall have a centerline radius equal to 1.5 times the width of the duct. This results in an inside radius equal to the width of the duct. Under no circumstances will radius elbows with a centerline radius of 0.5 times the duct width and an inside radius of 0.0 (90 degrees angle throat and radius heel) be allowed.
 - 2. Mitered Elbow (Square Throat Square Heel) All mitered elbows with an angle over 45 degrees shall be provided with turning valves.
- E. All duct sizes shown on plans are net free area.
- F. All duct sections and fittings shall be fabricated with the ASTM stamp side of the sheets used for the exterior surfaces.

3.02 DUCT SEALANT

A. All duct systems shall be sealed to meet SMACNA Seal Class B. Seal per SMCNA recommended methods with sealant or sealant plus tape as appropriate. All transverse and longitudinal seams in all positive pressure and negative pressure ducts shall be sealed.

3.03 DUCTWORK ACCESSORIES

- A. Flexible duct connection shall be installed on all ductwork required to be attached to motor driven equipment.
 - The ends of the flexible connection shall be overlapped and sealed, to prevent air leakage, per the manufacturer's recommendations. If manufacturer does not have recommended method of sealing, the following method shall be used. Both ends of the flexible connection shall be extended three inches and turned inward (into air stream). Silicone caulking shall be applied between the overlap and outward clinching staples shall be used to fasten the lap.
- B. Manual Balancing Dampers, Splitter Dampers, Quadrant Dampers
 - 1. All damper shall be installed so that damper blades have a full range of movement without interference or binding. Damper quadrant shall be located to provide easy access.

23 31 10 - 7 GALVANIZED SHEET METAL DUCTWORK

- C. Turning Vanes
 - 1. Turning vanes shall be installed in all mitered (Square Toe-Square Heel) elbows with an angle greater than 45 degrees. This shall include all supply, return, exhaust, transfer, etc. ducts.
 - 2. The trailing edge of the turning vanes shall be installed tangent to the air stream.
 - 3. All individual vanes shall be installed on the vane rails, i.e., omitting every other blade will not be allowed.

3.04 RECTANGULAR TO ROUND TAKE-OFFS

- A. Rectangular to round take-offs shall be installed in accurately cut openings in the sheet metal duct work.
- B. Rectangular to round take-offs shall be suitably sealed for the pressure class required.
- C. The quadrant damper shall be checked for free movement and left in the full open position after the take-off and insulation is installed.

3.05 INSULATED FLEXIBLE DUCTWORK

- A. For run outs to air distribution devices, the length of flexible duct work shall not exceed 5 feet. For lengths of duct required over 5 feet, the remainder shall be galvanized steel round duct. All other aspects of the installation of flexible ductwork shall follow SMACNA guidelines.
- B. Bends in flexible duct shall be made with not less than 1 duct diameter centerline radius. Extend flexible duct a few inches beyond end of sheet metal connection before bending.
- C. Flexible duct shall be secured to sheet metal duct with a draw band and be independent of flexible duct insulation. The insulation shall be secured with a separate draw band. A band of tape shall be applied to the end of the outer jacket and the sheet metal duct or air distribution device.

END OF SECTION

SECTION 23 34 10

CEILING AND CABINET FANS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide fans as indicated on the drawings and as specified herein with all accessories required for proper system balance.

1.02 REFERENCES

Air Diffusion Council (ADC)

Air Movement and Control Association (AMCA)

American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)

National Fire Protection Association (NFPA)

Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)

Underwriters Laboratories, Inc. (UL)

1.03 SUBMITTALS

A. Submit catalog data and shop drawings for all materials and equipment listed under the section.

PART 2 - PRODUCTS

2.01 CEILING AND CABINET FANS

- A. Cabinet Mounted Centrifugal Fans shall be UL listed and bear the AMCA Seal for air and sound performance. Housings shall have an integral backdraft damper, be acoustically insulated, convertible to either horizontal or vertical discharge and equipped with a white intake grille. Fan wheel shall be direct driven, dynamically balanced, forward curved type. Motors shall have internal thermal overload protection, be compatible with speed controllers, mounted on vibration isolators and factory wired for easy disconnect for inspection and service.
- B. Fans shall be equipped with mounting brackets readily adapted to various mountings.
- C. The following accessories shall be provided when indicated in the fan schedule:
 - 1. Vibration Isolation
 - 2. Speed Control mounted to fan
 - 3. Deluxe aluminum architectural grille
- D. Cook units are specified to establish quality of equipment. Equals by Penn, Twin City and Greenheck will be considered.

23 34 10 - 2 CEILING AND CABINET FANS

2.02 GENERAL

- A. Provide and install fans and accessories as scheduled on the Drawings and specified in this Section.
- B. Fan air performance ratings shall be in accordance with AMCA Standard 210.
- C. Fan sound performance ratings shall be in accordance with AMCA Standard 300. Sound levels shall not exceed specified level at specified air delivery conditions.
- D. Fan performance based on sea level conditions.
- E. Equivalent fan selections shall not decrease motor horsepower wattage), increase noise level, increase tip speed by more than 10 percent, or increase inlet air velocity by more than 10 percent, from that specified.
- F. Provide fans capable of accommodating static pressure variations of plus or minus 10 percent.
- G. Statically and dynamically balance fans to eliminate vibration or noise transmission to occupied areas of the building.
- H. Fan wheels and housings not of aluminum or stainless steel shall be factory primed inside and outside.

PART 3 - EXECUTION

3.01 CEILING AND CABINET FANS

- A. Set and install in line fans as specified and indicated on the drawings.
- B. Equipment installation shall be such that filters, motors, bearings can be easily serviced.
- C. Provide flexible connectors (specified in 23 31 10) at inlet and outlet of in line fans.
- D. All fans shall be checked for proper rotation and be lubricated before start-up.

END OF SECTION

SECTION 23 34 12

CENTRIFUGAL EXHAUST FANS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide fans as indicated on the drawings and as specified herein with all accessories required for proper system balance.

1.02 REFERENCES

Air Diffusion Council (ADC)

Air Movement and Control Association (AMCA)

American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)

National Fire Protection Association (NFPA)

Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)

Underwriters' Laboratories, Inc. (UL)

1.03 SUBMITTALS

A. Submit catalog data and shop drawings for all materials and equipment listed under this section.

PART 2 - PRODUCTS

2.01 CENTRIFUGAL EXHAUST FANS

A. Centrifugal Exhaust Fans

Centrifugal Exhaust Fans shall be UL Listed and bear the AMCA Seal for air and sound performance. Housings shall be constructed of heavy gauge, spun aluminum with a rolled bead. Curb cap shall be one piece, aluminum with deep spun venturi inlet and pre-punched mounting holes. Motor and drive housings shall be constructed of aluminum, provide easy access to motors and drives, be isolated from fan discharge air and be positively ventilated with fresh air. Fan wheels shall be constructed of aluminum, be statically and dynamically balanced and backward curved, non-overloading type. Drives of belt drive fans shall have shafts mounted with heavy duty, permanently lubricated, sealed ball bearings and be equipped with variable pitch, cast iron pulleys. Drives shall be sized for a minimum of 150 percent of driven power. Motors shall have permanently lubricated, sealed ball bearings and be factory wired with disconnect switches in the motor compartment. Motor and drive assemblies shall be mounted on vibration isolators.

B. Low Silhouette Centrifugal Exhaust Fans

Low Silhouette Centrifugal Exhaust Fans shall be UL Listed and bear the AMCA Seal for air and sound performance. Fans shall have fabricated hoods constructed of heavy gauge aluminum with roll formed stiffening ribs or louvered penthouse hoods constructed of heavy gauge extruded aluminum. Hoods shall be hinged for easy access to motor, drive and fan. Curb cap shall be one piece, aluminum with deep spun venturi inlet and pre-punched

23 34 12-2 CENTRIFUGAL EXHAUST FANS

mounting holes. Fan wheels shall be constructed of aluminum, be statically and dynamically balanced and backward curved, non-overloading type. Drives of belt drive fans shall have shafts mounted with heavy duty, permanently lubricated, sealed ball bearings and be equipped with variable pitch, cast iron pulleys. Drives shall be sized for a minimum of 150 percent of driven power. Motors shall have permanently lubricated, sealed ball bearings and be factory wired with disconnect switches in the motor compartment. Motor and drive assemblies shall be mounted on vibration isolators.

- C. The following accessories shall be provided when indicated in the fan schedule:
 - 1. Backdraft Dampers shall be heavy duty box type, blades of aluminum with felt edges, linked together with a counterbalanced adjustable spring.
 - 2. Roof curbs shall be of welded construction, G-90 galvanized steel with 3# density rigid, 1" insulation with FSK jacket. Minimum curb height to be 12". Roof curves to be canted with a wood nailer. Curbs shall be sloped for a true level surface for the equipment to rest on .
 - 3. Provide mounting frame for wall mounted exhaust fans
 - 4. Speed controls for direct drive fans.
 - 5. Protective coating.
 - 6. Service switch.
- D. Cook units are specified to establish quality of equipment. Equals by Greenheck, Penn and Twin City will be considered.

2.02 GENERAL

- A. Provide and install fans and accessories as scheduled on the Drawings and specified in this section.
- B. Fan air performance ratings shall be in accordance with AMCA Standard 210.
- C. Fan sound performance ratings shall be in accordance with AMC Standard 300. Sound levels shall not exceed specified level at specified air delivery conditions.
- D. Fan performance based on sea level conditions.
- E. Equivalent fan selections shall not decrease motor horsepower (wattage), increase noise level, increase tip speed by more than 10 percent, or increase inlet air velocity by more than 10 percent, from that specified.
- F. Provide fans capable of accommodating static pressure variations of plus or minus 10 percent.
- G. Provide balanced variable sheaves for all motors with the size selected at midpoint in the adjustment.
- H. Statically and dynamically balance fans to eliminate vibration or noise transmission to occupied areas of the building.
- I. Provide belt guards on belt driven fans and safety screens where inlet or outlet is exposed.
- J. Fan wheels and housings not of aluminum or stainless steel shall be factory primed inside and outside.

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PART 3 - EXECUTION

3.01 CENTRIFUGAL EXHAUST FANS

- A. Set and install roof mounted fans on curbs and structural steel frame.
- B. Equipment installation shall be such that filters, motors, bearings, and belts can be easily serviced.
- C. Provide flexible connections at inlet ducts of roof mounted fans per 233110.
- D. All fans shall be checked for proper direction of rotation and be lubricated before start-up.
- E. Set wall mounted exhaust fan on angle iron frame (2 x 2 x 1/4) angle minimum. anchor frame to wall with a minimum of 3 anchors per side. Anchors shall be 3/8" diameter butterfly bolts.

END OF SECTION

SECTION 26 01 01

BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL REQUIREMENTS

1.1 RELATED DOCUMENTS

- A. The following codes and standards are referenced in this document.
 - 1. NFPA 70, National Electrical Code, 2017
 - 2. ASHRAE 90.1, Energy Standard for Buildings, 2013
 - 3. International Fire Code (IFC) 2015
 - 4. International Building Code (IBC) 2015
 - 5. Americans with Disabilities Act Accessibility Guidelines (ADAAG) 2010
- B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division1 Specification Sections, apply to this Section.

1.2 SCOPE OF WORK

- A. Arrange with the local utility companies for providing such electrical services as shown on drawings or herein specified. Coordinate all requirements for the electrical services shown on the plans with the utility engineering and construction supervisors prior to bidding and/or roughing. NOTIFY ENGINEER IN WRITING OF DISCREAPANCIES BETWEEN PLANS AND UTILITY REQUIREMENTS FOR RESOLUTION PRIOR TO BIDDING.
- B. Furnish and install complete temporary electrical light and power system during construction period. The required temporary lighting required during finish work shall be sufficient so as to facilitate other trades (finishes). Coordinate lighting requirements where interior finishes are being applied with the general contractor and/or painting subcontractor.
- C. Furnish and install complete electrical light and power systems.
- D. Provide and install required electrical service (normal and emergency generator) for required fire pump. Coordinate all electrical requirements with approved fire pump equipment submittals prior to any roughing. Notify engineer in writing of discrepancies between plans and submitted equipment for resolution prior to any roughing.
- E. Provide and install diesel fired generator set and transfer switches as shown on the plans.
- F. Connect all meters, switchboards, panelboards, dry type transformers, circuit breakers, power outlets, convenience outlets, switches and/or other equipment forming part of the system.
- G. Furnish and install complete system of outlet boxes, faceplates, conduit raceways, cables and terminal cabinets for IT and security systems system.
- H. Connect all electrical equipment noted in this Section or noted on Drawings, whether furnished by Electrical Contractor or by others.
- I. The electrical contractor shall review <u>all</u> sections of the contract documents (Plans and Specifications) and shall endeavor to determine all equipment requiring electrical power whether shown on the electrical plans or not. Notify the Electrical Engineer in writing prior to the bid with any discrepancies with mechanical and/or plumbing plans. Include in bid price all required materials and labor required for a full functioning system/building.

- J. Connect all mechanical and plumbing equipment as required to provide a full functioning system as specified by the Mechanical Engineer. Verify locations for all dampers (control dampers and fire/smoke dampers), circulating pumps, fans, boilers, water heaters and other loads with the mechanical and plumbing plans prior to bidding.
- K. Install all starters as shown on plans or as called for in these Specifications. All starters shall be NEMA rated. All VF drives for mechanical equipment shall be furnished and installed by mechanical contractor with power feeder and final connections to the VF drive by the electrical contractor.
- L. Furnish and install all disconnect switches.
- M. Furnish and install power wiring and connection for starters and motors. Furnish and install all control wiring specifically shown on drawings or as required to make the system operational as designed.
- N. Furnish and install Auxiliary Systems as shown on the Drawings and as required.
- O. Procure and pay for permits and certificates as required by local and state ordinances and Fire Underwriters Certificate of Inspection.
- P. Submit to Architect, a certificate of Final Inspection from local inspection department.
- Q. Work noted "NIC" (Not in Contract) shall be excluded from the work to be done by this trade, as follows:
 - 1. A complete System of Control Wiring for the Mechanical System (unless specifically shown on Drawings).
 - 2. Motors in place by others, connection for correct rotation by this trade.
- R. <u>Division 26 will be responsible to support the commissioning requirements specified in section</u> 01 91 13 and other sections referenced in 01 91 13.

1.3 DRAWINGS AND SPECIFICATIONS

- A. Electrical work shown on drawings inclusive. Follow any supplementary drawings as though listed above.
- B. Drawings and Specifications are complementary. Work called for by one is binding as if called for by both.
- C. Drawings show general run of circuits and approximate location of equipment. Right is reserved to change location of equipment and devices and routing of conduits to a reasonable extent, without extra cost to Owner.
- D. Refer conflicts between drawings and specifications describing electrical work and work under other Sections to Architect for remedial action.
- E. Use dimensions in figures in preference to scaled dimensions. Do not scale drawings for exact sizes or locations.
- F. Execution of Contract is evidence that Contractor has examined all drawings and specifications related to work, and is informed to extent and character of work. Later claims for labor and materials required due to difficulties encountered, which should have been foreseen had examination been made, will not be recognized.

1.4 **PROJECT COORDINATION MEETINGS**

A. Promptly after award of the Contract, and prior to commencing any project related activities. The Successful Electrical Contractor shall contact the Electrical Engineer to schedule an

acceptable date and time for the initial project coordination meeting. This meeting will be held at the Electrical Engineer's office at the scheduled time to discuss any/all issues related to the electrical aspects of the Project. The Contractor, as well as the contractor's job foreman/superintendent for the project is required to attend this meeting. The contractor shall furnish a complete set of Plans and Specifications at this meeting.

1.5 EXISTING CONDITIONS

A. The Contractor shall visit the site and determine all conditions that affect this Contract. Contractor shall include in bid price cost of relocating any electrical or auxiliary lines and/or equipment as required whether shown or not. Failure to do so will not relieve Contractor of his/her responsibility under this contract.

1.6 DEMOLITION

- A. Where electrical work to remain is damaged or disturbed in the course of the work, remove damaged portions and install new products of equal capacity, quality, and functionality.
- B. Accessible Work Indicated to Be Demolished: Remove exposed electrical installation in its entirety.
- C. Abandoned Work: Cut and remove buried raceway and wiring shown to be abandoned in place, 2 inches below the surface of adjacent construction. Cap and patch surface to match existing finish.
- D. Removal: All electrical equipment not specifically noted for re-use/connection shall remain property of the Owner. Store as directed by Architect/Owner.
- E. Temporary Disconnection: Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.
- F. Locate and protect all existing underground utilities located within the project limits as required during demolition and new construction. All circuits (to remain) that are interrupted as a result of the required demolition shall be repaired/extended as required without additional charges to owner.

1.7 TEMPORARY SYSTEMS

- A. The Contractor shall be responsible for the furnishing and installation of all equipment and materials necessary for providing electrical power and lighting to the <u>new</u> building during construction. All temporary wiring shall be made in a safe and approved manner.
- B. It shall be the responsibility of the electrical contractor to visit the site prior to submitting bid and thoroughly review all existing conditions affecting the temporary systems requirements.
- C. The contractor shall provide temporary lighting levels as necessary where interior finishes are being applied. Coordinate with general contractor for required lighting.

1.8 CONTRACTOR QUALIFICATIONS

A. <u>Qualified electrical contractors shall have been prequalified by the Architect and Owner</u> to bid this project.

- B. If the electrical contractor proposes to use any other subcontractor for the installation of any auxiliary system, etc., these Subcontractors shall be a factory-authorized distributor of the specified system and shall also meet the above qualifications before bid is acceptable.
- C. The Electrical Contractor shall use State of Alabama licensed masters and journeymen electricians as job superintendents. The Electrical Contractors superintendent (Journeyman or Master Electrician) shall be on site when electrical work is being performed. The Electrical

Contractor shall have on Journeyman or Master Electrical on site for every eight (8) apprentices.

1.9 QUALITY ASSURANCE

- A. All work shall be in accordance with the NFPA 70 National Electrical Code NEC 2017 and the rules and regulations of the local bodies having jurisdiction.
- B. The published standards and requirements of the National Electrical Manufacturers Association, the American National Standard Institute, the Institute of Electrical and Electronic Engineers, and the American Society of Testing Materials, are made a part of these specifications and shall apply wherever applicable.
- C. Work under this Section shall be first class with emphasis on neatness and workmanship.
- D. Install work using competent mechanics under supervision of foreman, all duly certified by local authorities. Installation subject to Architect's constant observation, final approval, and acceptance. Architect may reject unsuitable work.
- E. Furnish Architect written guarantee, stating that if workmanship and/or material executed under this Section is proven to be defective within one (1) year after final acceptance, such defects and other work damaged will be repaired and/or replaced.
- F. Listing and Labeling: Provide products specified in this Section that are listed and labeled. The Terms "Listed and Labeled": As defined in the National Electrical Code, Article 100.

1.10 ON-SITE OBSERVATIONS AND DEMONSTRATION OF FUNCTIONALITY

- A. Contractor shall notify Engineer at least three (3) days prior to covering any underground feeders, pouring slab, installing ceiling systems in order to allow time for on-site observations.
- B. <u>At all observations of work</u>, open panel covers, junction box covers, pull box covers, device covers, and other equipment with removable plates for check. Provide sufficient personnel to expedite cover removal and replacement.
- C. Contractor to assist Architect in demonstration of operation of new systems to satisfaction of Owner. Contractor to have manufacturer available for demonstration of systems where requested by Owner or as called for in other sections of this specification. Contractor shall notify Engineer and Architect two (2) weeks prior to demonstration of systems where manufacturer assistance is required.
- D. Perform test required by Architect to indicate compliance with specifications, drawings and applicable codes. Provide instruments, labor and materials for tests.

1.11 PROTECTION OF PERSONS AND PROPERTY DURING CONSTRUCTION

- A. Take all precautions to provide safety and protection to persons and protection of materials and property as necessary, including protection from injury from rotating or moving equipment, tools, hot surfaces, holes, shafts, falling objects, electrical energy and all other potential hazards. Erect sign, barricades, warning lights, instruct workmen and others who may be subject to construction hazards.
- B. Protect items of equipment from stain, corrosion, scratches and any other damage or dirt, whether in storage at job site or installed. No damaged or dirty equipment, lenses or reflectors will be accepted.

1.12 CLEARANCE WITH UTILITIES

A. Before submitting a proposal, check with all authorities or utilities concerned as to points of connection with power and telephone lines, installation of transformers, location of service cut-in

and metering, requirements as to any additional service equipment, and other details of the installation. If their requirements are at variance with these specifications or drawings and involve extra expense, these requirements shall be included in bid and the contract price shall include all costs necessary to meet those requirements without extra cost to the Owner after a contract is entered into.

1.13 CHANGES ORDERS AND ADDITONAL WORK

A. No change shall be made from the work as called for by these specifications and drawings except on written order of the Architect. Deviations from drawings and specifications shall be made in submittal form and shall include all information for approval including drawings where required. No change for extra work will be allowed unless such extra work has been duly authorized by a written order of the Architect stating the change to be made.

1.14 SEQUENCING AND SCHEDULING

- A. Coordinate electrical equipment installation with other building components.
- B. Arrange for chases, slots, and openings in building structure during progress of construction to allow for electrical installations.
- C. Coordinate installing required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
- D. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning prior to closing in the building.
- E. Coordinate connecting electrical service to components furnished under other Sections.
- F. Coordinate connecting electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.
- G. Coordinate installing electrical identification after completion of finishing where identification is applied to field-finished surfaces.
- H. Coordinate installing electrical identifying devices and markings prior to installing acoustical ceilings and similar finishes that conceal such items.

1.15 AS-BUILT DRAWINGS

- A. Contractor to provide to owner at project completion the following:
 - 1. Two (2) compact disc/DVD volumes with color pdf files showing any/all deviations to the contract documents.
 - 2. One each set of electrical plans on reproducible media indicating any/all deviations to contract documents.

1.16 COORDINATION WITH OTHER TRADES

- A. Review all specification sections and drawings including HVAC, plumbing and other equipment drawings and other divisions of the specifications for equipment requiring electrical service. Provide service to and make connections to all such equipment requiring electrical service.
- B. Contractor to coordinate all aspects of mechanical equipment furnished and installed by others with approved equipment submittals prior to any roughing. It is the responsibility of this contractor to coordinate phase, voltage, minimum circuit amps and maximum over-current protective devices with approved submittals prior to roughing. Coordinate exact connection

locations with the mechanical contractor prior to any roughing. Notify engineer in writing of discrepancies between the plans and the approved equipment data.

- C. Contractor to coordinate all aspects of plumbing equipment furnished and installed by others with approved equipment submittals prior to any roughing. It is the responsibility of this contractor to coordinate phase, voltage, minimum circuit amps and maximum over-current protective devices with approved equipment submittals prior to roughing. Coordinate exact connection locations with plumbing contractor prior to any roughing. Notify engineer in writing of discrepancies between the plans and the approved equipment data.
- D. Coordination Shop Drawings: Electrical contractor shall coordinate with other trades (structural, mechanical, plumbing, and fire protection) to determine the space required, and the routing and locations of their respective trades. Prepare shop drawings at ¼" = 1'-0" scale for all electrical rooms and rooms with electrical panels, main data frame room (MDF), intermediate data frame rooms (IDF), and corridors showing electrical, fire protection, mechanical, and plumbing work with elevations to equipment, conduit routing, and clearances for equipment noted. Failure to coordinate does not constitute a change order when components will not fit within the allocated space and may result in installed equipment and materials being removed at the contractor's expense.

PART 2 - ELECTRICAL PRODUCT REQUIREMENTS

2.1 SUBMITTALS AND MATERIALS DATA

A. For this project - all submittals under this division shall be provided in searchable PDF file format. All warranty materials and O&M manuals shall be provided in searchable PDF file format.

- B. The approval of shop drawing shall not be interpreted as a complete check by the Engineer, but will indicate only that the general specifications for the equipment to be provided is satisfactory. Approval of such drawings does not relieve the contractor of responsibility of coordination of components, auxiliary equipment, accessories or special conditions required for satisfactory operation of the completed system.
- C. All shop drawings for a specific item shall be made in one submittal. No submittals will be checked until <u>all</u> required submittals are received by the Engineer. All submittals must be approved prior to commencing any work on this project.
- D. The electrical contractor shall check all suppliers' submittals regarding measurements, capacity, performance, and details to satisfy him/herself that they conform to the intent of the contract drawings and specifications. Shop drawings and submittals shall bear the stamp of approval of the Contractor as evidence that the drawings have been checked by him. <u>Drawings submitted without this stamp of approval will not be considered and will be returned for contractor approval and stamp.</u> A minimum of ten (10) working days shall be allowed for checking for submittals.
- E. Any materials and equipment listed which are not in accordance with specification requirements may be rejected.
- F. All submittals shall clearly identify the item submitted. Standard catalog sheets shall be marked, in ink to identify which item is to be considered. <u>All drawings submitted must be by factory as field drawings will not be accepted</u>.

2.2 ELECTRICAL PRODUCT SUBSTITUTIONS

A. Any proposed substitution of equipment or materials from that specified must be submitted in writing to the Engineer within ten (10) days prior to the bid date. The Engineer will respond in writing as to the acceptance/rejection of the proposed product. Faxed transmittals, e-mails and verbal requests will not be considered.

- B. All proposed substitutions shall clearly identify the item submitted as well as the technical information that is called for in other portions of the Electrical Divisions of this Specification. Standard catalog sheets shall be marked, in ink to identify which item is to be considered. All drawings submitted must be by prepared by the factory as field/distributor-prepared drawings will not be accepted.
- C. It is the contractor's sole responsibility to insure that any/ all costs associated with additional materials, labor, setup, programming and coordination required for, or associated with, the inclusion of any products/ systems specified as an equal or pre-approved equal to the product/ system specified in his/ her bid are included in the bid price. No change order will be accepted on the basis of additional work or materials required as a result of a product substitution.

PART 3 - EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

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. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.3 **DEFINITIONS**

A. VFC: Variable frequency controller.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Alcan Products Corporation; Alcan Cable Division.
 - 2. Encore Wire Corporation.
 - 3. General Cable Technologies Corporation.
 - 4. Southwire Incorporated.
- B. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.
- C. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN-2-THWN-2, Type XHHW-2, and Type SO.

D. VFC Cable:

- 1. Comply with UL 1277, UL 1685, and NFPA 70 for Type TC-ER cable.
- 2. Type TC-ER with oversized crosslinked polyethylene insulation, dual spirally wrapped copper tape shields and three bare symmetrically applied ground wires, and sunlight- and oil-resistant outer PVC jacket.
- 3. Comply with UL requirements for cables in Classes I and II, Division 2 hazardous location applications as required.

2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Hubbell Power Systems, Inc.
 - 3. Ideal Industries, Inc.
 - 4. O-Z/Gedney; a brand of the EGS Electrical Group.
 - 5. 3M; Electrical Markets Division.
 - 6. Tyco Electronics.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger, except VFC cable, which shall be extra flexible stranded.

3.2 CONDUCTOR INSULATION AND WIRING METHODS

A. Service Entrance: Type XHHW-2, single conductors in raceway (Southwire SIMPull or approved equal). Cross-linked polyethylene (XLP) insulation.

- B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway (Southwire SIMPull or approved equal).
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN/THWN-2, single conductors in raceway (Southwire SIMPull or approved equal).
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway (Southwire SIMPull or approved equal). Cross-linked polyethylene (XLP) insulation.
- E. Exposed Branch Circuits, Including in Crawlspaces: Type THHN-2-THWN-2, single conductors in raceway.
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-2-THWN-2, single conductors in raceway.
- G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-2-THWN-2, single conductors in raceway.
- H. Branch Circuits Installed below Raised Flooring: Type THHN-2-THWN-2, single conductors in raceway.
- I. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainlesssteel, wire-mesh, strain relief device at terminations to suit application.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 26 05 33 "Raceways and Boxes" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.
- F. Support cables according to Section 26 05 29 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torquetightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 26 05 53 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 05 44 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to IBC 711 and 712, latest revision."

3.8 FIELD QUALITY CONTROL

- A. Provide third party, NETA certified technician to perform the following tests and inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance conductors, all panelboard feeder conductors and conductors feeding the following critical equipment and services for compliance with requirements.
 - a. Generator Set.
 - b. Uninterruptible Power Supplies.
 - c. Chillers.
 - d. Dimming Racks
 - e. Cooling Towers.
 - 2. Perform each visual and mechanical inspection and <u>electrical</u> test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 3. Perform electrical test.
- B. Test and Inspection Reports: Prepare a written report to record the following:
 - 1. Procedures used.
 - 2. Results that comply with requirements.

- 3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- C. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

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: Grounding systems and equipment.
- B. Section includes grounding systems and equipment.

1.3 ACTION SUBMITTALS

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

1.4 INFORMATIONAL SUBMITTALS

- A. Informational Submittals: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:
 - 1. Test wells.
 - 2. Ground rods.
 - 3. Ground rings.
 - 4. Grounding arrangements and connections for separately derived systems.
 - 5. Grounding for sensitive electronic equipment.
 - 6. Grounding equipment enclosures.
- B. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.
- C. Comply with NFPA 70, Section 250 (National Electrical Code) for grounding and bonding.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:

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- 1. Solid Conductors: ASTM B 3.
- 2. Stranded Conductors: ASTM B 8.
- 3. Tinned Conductors: ASTM B 33.
- 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
- 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
- 6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- 7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 12 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.

2.2 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, pressure type with at least two bolts.
 - 1. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- D. Bus-bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, 3/4 inch diameter by 10 feet in length.
- B. Chemical-Enhanced Grounding Electrodes (where required to achieve specified grounding system resistance values): Copper tube, straight or L-shaped, charged with nonhazardous electrolytic chemical salts.
 - 1. Termination: Factory-attached No. 4/0 AWG bare conductor at least 48 inches long.
 - 2. Backfill Material: Electrode manufacturer's recommended material.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum.
 - 1. Bury at least 24 inches below grade.

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- C. Grounding Bus: Install in electrical and telephone/IT equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
 - 1. Install bus on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
 - 2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down to specified height above floor; connect to horizontal bus.
- D. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
 - 3. Connections to Ground Rods at Test Wells: Bolted connectors.
 - 4. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 - 1. Feeders and branch circuits.
 - 2. Lighting circuits.
 - 3. Receptacle circuits.
 - 4. Single-phase motor and appliance branch circuits.
 - 5. Three-phase motor and appliance branch circuits.
 - 6. Flexible raceway runs.
 - 7. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
 - 8. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.
- C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- D. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- E. Signal and Communication Equipment: In addition to grounding and bonding required by NFPA 70, provide a separate grounding system complying with requirements in TIA/ATIS J-STD-607-A.
 - 1. For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

- 2. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-4-by-12-inch grounding bus.
- 3. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
- F. Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install at least three rods spaced at least two-rod lengths from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- D. Grounding and Bonding for Piping:
 - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
 - 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 - 3. Bond each above-ground portion of gas piping system downstream from equipment shutoff valve.
- E. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.
- F. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart.

- G. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70; use a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.
 - 1. If concrete foundation is less than 20 feet long, coil excess conductor within base of foundation.
 - 2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building's grounding grid or to grounding electrode external to concrete.

3.4 LABELING

- A. Comply with requirements in Section 26 05 53 "Identification for Electrical Systemws" for instruction signs. The label or its text shall be green.
- B. Install labels at the telecommunications bonding conductor and grounding equalizer and at the grounding electrode conductor where exposed.
 - 1. Label Text: "If this connector or cable is loose or if it must be removed for any reason, notify the facility manager."

3.5 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 - 3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells , and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
 - 4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Report measured ground resistances that exceed the following values:
 - 1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
 - 2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
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- 3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
- 4. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).
- F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- 1.2 SUMMARY
 - A. This Section includes the following:
 - 1. Hangers and supports for electrical equipment and systems.
 - 2. Construction requirements for concrete bases.

1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.
- 1.4 PERFORMANCE REQUIREMENTS
 - A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
 - B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
 - C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
 - D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.
- 1.5 ACTION SUBMITTALS
 - A. Product Data: For the following:
 - 1. Steel slotted support systems.
 - 2. Nonmetallic slotted support systems.

- B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following:
 - 1. Trapeze hangers. Include Product Data for components.
 - 2. Steel slotted channel systems. Include Product Data for components.
 - 3. Nonmetallic slotted channel systems. Include Product Data for components.
 - 4. Equipment supports.
 - 5.
- 1.6 QUALITY ASSURANCE
 - A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code Steel."
 - B. Comply with NFPA 70.
- 1.7 COORDINATION
 - A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified together with concrete Specifications.
 - B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in architectural specifications

PART 2 - PRODUCTS

- 2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS
 - A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.; a division of Cooper Industries.
 - c. ERICO International Corporation.
 - d. GS Metals Corp.
 - e. Thomas & Betts Corporation.
 - f. Unistrut; Tyco International, Ltd.
 - g. Wesanco, Inc.
 - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 3. Channel Dimensions: Selected for applicable load criteria.
 - B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
 - C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
 - D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) Hilti Inc.
 - 4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 5) MKT Fastening, LLC.
 - 2. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
 - 3. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
 - 4. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
 - 5. Toggle Bolts: All-steel springhead type.
 - 6. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements specified elsewhere "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as scheduled in NECA 1, where its Table 1 lists maximum spacings less than stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - 1. Secure raceways and cables to these supports with two-bolt conduit clamps.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

- E. All cable trays to be grounded per NFPA 70, Article 392 as required for conductor enclosure in accordance with NFPA 70 article 250. Provide bonding jumpers (#8 AWG) between each section. Provide bonding jumper (#4 AWG) from tray system to system ground. Bond all conduits terminated at cable tray.
- 3.2 SUPPORT INSTALLATION
 - A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
 - B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
 - C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.
 - 5. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
 - 6. To Light Steel: Sheet metal screws.
 - 7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
 - D. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements specified elsewhere "Metal Fabrications" for sitefabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi, 28-day compressive-strength concrete unless otherwise shown. Concrete materials, reinforcement, and placement requirements are specified elsewhere.

- C. Anchor equipment to concrete base.
 - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Comply with requirements specified elsewhere in these specifications for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

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. Metal conduits, tubing, and fittings.
 - 2. Non-metal conduits, tubing, and fittings.
 - 3. Metal wireways and auxiliary gutters.
 - 4. Non-metal wireways and auxiliary gutters.
 - 5. Surface raceways.
 - 6. Boxes, enclosures, and cabinets.
 - 7. Hand holes and boxes for exterior underground cabling.

1.3 **DEFINITIONS**

- A. ARC: Aluminum rigid conduit.
- B. GRC: Galvanized rigid steel conduit.
- C. IMC: Intermediate metal conduit.

1.4 ACTION SUBMITTALS

- A. Product Data: For all products specified in this section.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.
- C. Samples: For wireways and/or nonmetallic wireways and surface raceways and for each color and texture specified, 12 inches long.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
 - 1. Structural members in paths of conduit groups with common supports.
 - 2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.
- B. Qualification Data: For professional engineer.
- C. Seismic Qualification Certificates: For enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.

- 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
- 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
- 3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- 4. Detailed description of conduit support devices and interconnections on which the certification is based and their installation requirements.
- D. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. <u>Manufacturers</u>: Subject to compliance with requirements, provide products by one of the following:
 - 1. AFC Cable Systems, Inc.
 - 2. <u>Allied Tube & Conduit; a Tyco International Ltd. Co.</u>
 - 3. <u>Anamet Electrical, Inc</u>.
 - 4. <u>Electri-Flex Company</u>.
 - 5. O-Z/Gedney; a brand of EGS Electrical Group.
 - 6. <u>Picoma Industries, a subsidiary of Mueller Water Products, Inc.</u>
 - 7. <u>Republic Conduit</u>.
 - 8. <u>Robroy Industries</u>.
 - 9. <u>Southwire Company</u>.
 - 10. Thomas & Betts Corporation.
 - 11. Western Tube and Conduit Corporation.
 - 12. Wheatland Tube Company; a division of John Maneely Company.
- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. GRC: Comply with ANSI C80.1 and UL 6.
- D. ARC: Comply with ANSI C80.5 and UL 6A.
- E. IMC: Comply with ANSI C80.6 and UL 1242.
- F. EMT: Comply with ANSI C80.3 and UL 797.
- G. FMC: Comply with UL 1; zinc-coated steel.
- H. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- I. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
 - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
 - 2. Fittings for EMT:
 - a. Material: Steel.
 - b. Type: Setscrew or compression.

- 3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
- J. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. <u>Manufacturers</u>: Subject to compliance with requirements, provide products by one of the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Anamet Electrical, Inc.
 - 3. Arnco Corporation.
 - 4. CANTEX Inc.
 - 5. CertainTeed Corp.
 - 6. <u>Condux International, Inc</u>.
 - 7. Electri-Flex Company.
 - 8. Kraloy.
 - 9. Lamson & Sessions; Carlon Electrical Products.
 - 10. <u>Niedax-Kleinhuis USA, Inc</u>.
 - 11. RACO; a Hubbell company.
 - 12. Thomas & Betts Corporation.
- B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- D. LFNC: Comply with UL 1660.
- E. RTRC: Comply with UL 1684A and NEMA TC 14.
- F. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
- G. Fittings for LFNC: Comply with UL 514B.
- H. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. <u>Manufacturers</u>: Subject to compliance with requirements, provide products by one of the following:
 - 1. <u>Cooper B-Line, Inc</u>.
 - 2. <u>Hoffman; a Pentair company</u>.
 - 3. Mono-Systems, Inc.
 - 4. <u>Square D; a brand of Schneider Electric</u>.

- B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 unless otherwise indicated, and sized according to NFPA 70.
 - 1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Screw-cover type unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

2.4 BOXES, ENCLOSURES, AND CABINETS

- A. <u>Manufacturers</u>: Subject to compliance with requirements, provide products by one of the following:
 - 1. <u>Adalet</u>.
 - 2. Cooper Technologies Company; Cooper Crouse-Hinds.
 - 3. <u>EGS/Appleton Electric</u>.
 - 4. Erickson Electrical Equipment Company.
 - 5. <u>FSR Inc</u>.
 - 6. <u>Hoffman; a Pentair company</u>.
 - 7. <u>Hubbell Incorporated; Killark Division</u>.
 - 8. <u>Kraloy</u>.
 - 9. <u>Milbank Manufacturing Co</u>.
 - 10. Mono-Systems, Inc.
 - 11. O-Z/Gedney; a brand of EGS Electrical Group.
 - 12. RACO; a Hubbell Company.
 - 13. <u>Robroy Industries</u>.
 - 14. Spring City Electrical Manufacturing Company.
 - 15. <u>Stahlin Non-Metallic Enclosures; a division of Robroy Industries.</u>
 - 16. Thomas & Betts Corporation.
 - 17. <u>Wiremold / Legrand</u>.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- E. Metal Floor Boxes:
 - 1. Material: As shown on the plans.
 - 2. Type: As shown on the plans.
 - 3. Shape: Rectangular.
 - 4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- F. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- G. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- H. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- I. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- J. Gangable boxes [are allowed] [are prohibited].
- K. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 - 2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- L. Cabinets:
 - 1. NEMA 250, Type 1 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.
 - 6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.5 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. General Requirements for Handholes and Boxes:
 - 1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
 - 2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Composite Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Quazite
 - b. <u>Carson Industries LLC</u>.
 - c. <u>CDR Systems Corporation; Hubbell Power Systems</u>.
 - d. <u>Oldcastle Precast, Inc.; Christy Concrete Products</u>.
 - e. <u>Synertech Moulded Products; a division of Oldcastle Precast, Inc.</u>
 - 2. Standard: Comply with SCTE 77.
 - 3. Configuration: Designed for flush burial with open bottom unless otherwise indicated.

- 4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
- 5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
- 6. Cover Legend: Molded lettering, "ELECTRIC." or as shown on the plans.
- C. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with frame and covers as called for on plans.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. <u>Armorcast Products Company</u>.
 - b. <u>Carson Industries LLC</u>.
 - c. CDR Systems Corporation; Hubbell Power Systems.
 - d. <u>NewBasis</u>.
 - e. Nordic Fiberglass, Inc.
 - f. Oldcastle Precast, Inc.; Christy Concrete Products.
 - g. Synertech Moulded Products; a division of Oldcastle Precast, Inc.
 - 2. Standard: Comply with SCTE 77.
 - 3. Color of Frame and Cover: Green.
 - 4. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
 - 5. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
 - 6. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 - 7. Cover Legend: Molded lettering, "ELECTRIC." or as shown on the plans.

2.6 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

- A. Hand hole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
 - 1. Tests of materials shall be performed by an independent testing agency.
 - 2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
 - 3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012 and traceable to NIST standards.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 - 1. Exposed Conduit: GRC IMC.
 - 2. Concealed Conduit, Aboveground: GRC IMC.
 - 3. Underground Conduit: RNC, Type EPC-40-PVC or Type EPC-80-PVC (as shown on the Plans), direct buried or concrete encased as shown on the Plans.
 - 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 - 5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:

- 1. Exposed, Not Subject to Physical Damage: EMT.
- 2. Exposed, Not Subject to Severe Physical Damage: EMT.
- 3. Exposed and Subject to Severe Physical Damage: GRC or IMC. Raceway locations include the following:
 - a. Loading dock.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
- 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
- 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
- 6. Damp or Wet Locations: GRC or IMC.
- 7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 - 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 - 3. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.
 - 4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
- F. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
- G. Install surface raceways only where indicated on Drawings.

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.

- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. Support conduit within 12 inches of enclosures to which attached.
- I. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-footintervals.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.
 - 4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
 - 5. Change from RNC, Type EPC-40-PVC, to GRC or IMC before rising above floor.
- J. Stub-ups to Above Recessed Ceilings:
 - 1. Use EMT, IMC, or RMC for raceways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- L. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- M. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- N. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- O. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- P. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- Q. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- R. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a

blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

- S. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service raceway enters a building or structure.
 - 3. Where otherwise required by NFPA 70.
- T. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- U. Expansion-Joint Fittings:
 - 1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet. Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
 - 2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
 - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
 - c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
 - d. Attics: 135 deg F temperature change.
 - 3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
 - 4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
 - 5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.
- V. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semi-recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - 1. Use LFMC in damp or wet locations subject to severe physical damage.
 - 2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.
- W. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to bottom of box unless otherwise indicated.

- X. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- Y. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- Z. Locate boxes so that cover or plate will not span different building finishes.
- AA. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- BB. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- CC. Set metal floor boxes level and flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

- A. Direct-Buried Conduit:
 - 1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in civil specifications for pipe less than 6 inches in nominal diameter.
 - 2. Install backfill as specified in civil specifications
 - 3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in civil specifications
 - 4. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
 - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
 - 5. Underground Warning Tape: Comply with requirements in Section 260553 "Electrical Identification."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.

D. Install handholes with bottom below frost line.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 26 05 44 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in architectural specifications for Through-Penetration Firestop Systems."

3.7 **PROTECTION**

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

26 05 44 - 1 SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

SECTION 26 05 44

SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

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. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
 - 2. Sleeve-seal systems.
 - 3. Sleeve-seal fittings.
 - 4. Grout.
 - 5. Silicone sealants.
- B. Related Requirements:
 - 1. Architectural specifications for "Through-Penetration Firestop Systems" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Wall Sleeves:
 - 1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.
- C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

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- E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.
- F. Sleeves for Rectangular Openings:
 - 1. Material: Galvanized sheet steel.
 - 2. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
 - b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE-SEAL SYSTEMS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Advance Products & Systems, Inc.
 - b. CALPICO, Inc.
 - c. Metraflex Company (The).
 - d. Pipeline Seal and Insulator, Inc.
 - e. Proco Products, Inc.
 - 2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 - 3. Pressure Plates: Stainless steel.
 - 4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.3 GROUT

- A. Description: Non-shrink; recommended for interior and exterior sealing openings in non-firerated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

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- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
 - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in architectural specification section for "Joint Sealants."
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.
 - 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
 - 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
 - 1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

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END OF SECTION

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

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. Identification for raceways.
 - 2. Identification of power and control cables.
 - 3. Identification for conductors.
 - 4. Underground-line warning tape.
 - 5. Warning labels and signs.
 - 6. Instruction signs.
 - 7. Equipment identification labels.
 - 8. Miscellaneous identification products.

1.3 ACTION SUBMITTALS

- A. Product Data: For each electrical identification product indicated.
- B. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.
- C. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.4 QUALITY ASSURANCE

- A. Comply with ANSI A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER AND CONTROL RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.

2.2 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

2.3 FLOOR MARKING TAPE

A. 2-inch- wide, 5-mil pressure-sensitive vinyl tape, with yellow and black stripes and clear vinyl overlay.

2.4 UNDERGROUND-LINE WARNING TAPE

- A. Tape:
 - 1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - 2. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - 3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.
- B. Color and Printing:
 - 1. Comply with ANSI Z535.1 through ANSI Z535.5.
 - 2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE,.

2.5 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

2.6 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.
 - 1. Engraved legend with black letters on white face.
 - 2. Punched or drilled for mechanical fasteners.
 - 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.7 EQUIPMENT IDENTIFICATION LABELS

- A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.
- B. Nameplate color and information required on nameplate as shown on the Plans.

2.8 CABLE TIES

- A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
 - 1. Minimum Width: 3/16 inch.
 - 2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
 - 3. Temperature Range: Minus 40 to plus 185 deg F.
 - 4. Color: Black except where used for color-coding.
- B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.
 - 1. Minimum Width: 3/16 inch.
 - 2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
 - 3. Temperature Range: Minus 40 to plus 185 deg F.
 - 4. Color: Black.
- C. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, self-locking.
 - 1. Minimum Width: 3/16 inch.
 - 2. Tensile Strength at 73 deg F, According to ASTM D 638: 7000 psi.
 - 3. UL 94 Flame Rating: 94V-0.
 - 4. Temperature Range: Minus 50 to plus 284 deg F.
 - 5. Color: Black.

2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Attach signs and plastic labels with mechanical fasteners appropriate to the location and substrate.

- E. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- F. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.
- G. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.
- H. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl tape applied in bands. Install labels at 10-foot maximum intervals.
- B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
 - 1. Emergency Power.
 - 2. Fire Alarm System.
 - 3. Power feeders
 - 4. Intercom System
 - 5. Sound Systems
 - 6. IT Systems
- C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
 - 1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder, and branch-circuit conductors.
 - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Phase A Neutral: White, Black stripe.
 - 5) Phase B Neutral: White, Red stripe.
 - 6) Phase C Neutral: White, Blue stripe.
 - c. Colors for 480/277-V Circuits:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.

- 4) Phase A Neutral: White/Gray, Brown stripe.
- 5) Phase B Neutral: White, Gray, Orange stripe.
- 6) Phase C Neutral: White/Gray, Yellow stripe.
- d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- D. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- E. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive vinyl labels with the conductor or cable designation, origin, and destination.
- F. Control-Circuit Conductor Termination Identification: For identification at terminations provide self-adhesive vinyl labels with the conductor designation.
- G. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 - 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.
- H. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
 - 1. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- I. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- J. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Bakedenamel warning signs.
 - 1. Comply with 29 CFR 1910.145.
 - 2. Identify system voltage with black letters on an orange background.
 - 3. Apply to exterior of door, cover, or other access.
 - 4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
 - a. Power transfer switches.
 - b. Controls with external control power connections.
- K. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- L. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer.

- M. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
 - 1. Labeling Instructions:
 - a. Indoor Equipment (in equipment rooms): Engraved, laminated acrylic or melamine label, screw fastened. Unless otherwise indicated, provide and install nameplates with equipment name, voltage, and phase nameplate colors unique to system voltage.
 - b. Indoor Equipment (in finished spaces): Engraved, laminated acrylic or melamine label, secured to inside of door. Unless otherwise indicated, provide and install nameplates with equipment name, voltage, and phase nameplate colors unique to system voltage.
 - c. Outdoor Equipment: Engraved, laminated acrylic or melamine label, screw fastened. Unless otherwise indicated, provide and install nameplates with equipment name, voltage, and phase nameplate colors unique to system voltage
 - d. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
 - e. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
 - 2. Equipment to Be Labeled:
 - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be engraved, laminated acrylic or melamine label.
 - b. Enclosures and electrical cabinets.
 - c. Access doors and panels for concealed electrical items.
 - d. Switchboards.
 - e. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
 - f. Emergency system boxes and enclosures.
 - g. Enclosed switches.
 - h. Enclosed circuit breakers.
 - i. Enclosed controllers.
 - j. Variable-speed controllers.
 - k. Push-button stations.
 - I. Power transfer equipment.
 - m. Contactors.
 - n. Remote-controlled switches, dimmer modules, and control devices.
 - o. Battery-inverter units.
 - p. Monitoring and control equipment.

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IDENTIFICATION FOR ELECTRICAL SYSTEMS

q. UPS equipment.

END OF SECTION

SECTION 26 09 23 LIGHTING CONTROL DEVICES

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. Time switches.
 - 2. Photoelectric switches.
 - 3. Indoor occupancy sensors.
- B. Related Requirements:
 - 1. Section 26 27 26 "Wiring Devices" for wall-switch occupancy sensors, digital time switches and manual light switches.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show installation details for occupancy and light-level sensors.
 - 1. Interconnection diagrams showing field-installed wiring.
 - 2. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each type of lighting control device to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 TIME SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Intermatic, Inc.
 - 2. SensorSwitch
 - 3. Leviton Mfg. Company Inc.
- B. Electronic Time Switches: Solid state, programmable, with alphanumeric display; complying with UL 917.
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. Contact Configuration: SPST.

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- 3. Contact Rating: 20-A ballast load, 120-277-V AC.
- 4. Programs: Two on-off set points on a 24-hour schedule, allowing different set points for each day of the week.
- 5. Battery Backup: Not less than seven days reserve, to maintain schedules and time clock.

2.2 INDOOR OCCUPANCY SENSORS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Cooper Industries, Inc.
 - 2. Hubbell Building Automation, Inc.
 - 3. Leviton Mfg. Company Inc.
 - 4. Sensor Switch, Inc.
 - 5. Lutron, Inc.
- B. General Requirements for Sensors: Wall- or ceiling-mounted, solid-state indoor occupancy sensors with a separate power pack.
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. Operation: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
 - 3. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor is powered from the power pack.
 - 4. Power Pack: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Sensor has 24-V dc, 150-mA, Class 2 power source, as defined by NFPA 70.
 - 5. Mounting:
 - a. Sensor: Suitable for mounting in any position on a standard outlet box.
 - b. Relay: Externally mounted through a 1/2-inch knockout in a standard electrical enclosure.
 - c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
 - 6. Indicator: Digital display, to show when motion is detected during testing and normal operation of sensor.
 - 7. Bypass Switch: Override the "on" function in case of sensor failure.
 - 8. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc; turn lights off when selected lighting level is present.
- C. PIR Type: Ceiling mounted; detect occupants in coverage area by their heat and movement.
 - 1. Detector Sensitivity: Detect occurrences of 6-inch- minimum movement of any portion of a human body that presents a target of not less than 36 sq. in..
 - 2. Detection Coverage (Room): Detect occupancy anywhere in a circular area of 1000 sq. ft. when mounted on a 96-inch- high ceiling.
- D. Ultrasonic Type: Ceiling mounted; detect occupants in coverage area through pattern changes of reflected ultrasonic energy.

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- 1. Detector Sensitivity: Detect a person of average size and weight moving not less than 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s.
- 2. Detection Coverage (Small Room): Detect occupancy anywhere within a circular area of 600 sq. ft. when mounted on a 96-inch- high ceiling.
- 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. when mounted on a 96-inch- high ceiling.
- 4. Detection Coverage (Large Room): Detect occupancy anywhere within a circular area of 2000 sq. ft. when mounted on a 96-inch- high ceiling.
- E. Dual-Technology Type: Ceiling mounted; detect occupants in coverage area using PIR and ultrasonic detection methods. The particular technology or combination of technologies that control on-off functions is selectable in the field by operating controls on unit.
 - 1. Sensitivity Adjustment: Separate for each sensing technology.
 - 2. Detector Sensitivity: Detect occurrences of 6-inch- minimum movement of any portion of a human body that presents a target of not less than 36 sq. in., and detect a person of average size and weight moving not less than 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s.
 - 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. when mounted on a 96-inch- high ceiling.

2.3 SWITCHBOX-MOUNTED OCCUPANCY SENSORS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Cooper Industries, Inc.
 - 2. Hubbell Building Automation, Inc.
 - 3. Leviton Mfg. Company Inc.
 - 4. Lutron Electronics Co., Inc.
 - 5. Sensor Switch, Inc.
- B. General Requirements for Sensors: Automatic-wall-switch occupancy sensor, suitable for mounting in a single gang switchbox.
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. Operating Ambient Conditions: Dry interior conditions, 32 to 120 deg F.
 - 3. Switch Rating: Not less than 800-VA fluorescent at 120 V, 1200-VA fluorescent at 277 V, and 800-W incandescent.
- C. Wall-Switch Sensor Tag WS1:
 - 1. Standard Range: 180-degree field of view, field adjustable from 180 to 40 degrees; with a minimum coverage area of 2100 sq. ft.
 - 2. Sensing Technology: Dual technology PIR and ultrasonic.
 - 3. Switch Type: SP. SP, field selectable automatic "on," or manual "on" automatic "off."
 - 4. Voltage: Dual voltage, 120 and 277 V; dual-technology type.
 - 5. Concealed "off" time-delay selector at 30 seconds, and 5, 10, and 20 minutes.
 - 6. Adaptive Technology: Self-adjusting circuitry detects and memorizes usage patterns of the space and helps eliminate false "off" switching.

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2.4 CONDUCTORS AND CABLES

- A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 26 05 19 "Low Voltage Electrical Power Conductors and Cables."
- B. Classes 2 and 3 Control Cable: Multi-conductor cable with stranded-copper conductors not smaller than No. 18 AWG. Comply with requirements in Section 26 05 19 "Low Voltage Electrical Power Conductors and Cables."
- C. Class 1 Control Cable: Multi-conductor cable with stranded-copper conductors not smaller than No. 14 AWG. Comply with requirements in Section 26 05 19 "Low Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 SENSOR INSTALLATION

- A. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.
- B. Install and aim sensors in locations to achieve not less than 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.2 WIRING INSTALLATION

- A. Wiring Method: Comply with Section 26 05 19 "Low Voltage Electrical Power Conductors and Cables." Minimum conduit size is 3/4 inch.
- B. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and non-power-limited conductors according to conductor manufacturer's written instructions.
- C. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.3 IDENTIFICATION

- A. Identify components and power and control wiring according to Section 26 05 53 "Electrical Identification."
 - 1. Identify controlled circuits in lighting contactors.
 - 2. Identify circuits or luminaires controlled by photoelectric and occupancy sensors at each sensor.
- B. Label time switches and contactors with a unique designation.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Lighting control devices will be considered defective if they do not pass tests and inspections.

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C. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting sensors to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.
 - 1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.
 - 2. For daylighting controls, adjust set points and dead-band controls to suit Owner's operations.

3.6 DEMONSTRATION

- A. Coordinate demonstration of products specified in this Section with demonstration requirements for networked lighting control systems specified in Section 26 09 25 "Lighting Control System".
- B. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION

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WIRELESS LIGHTING CONTROL SYSTEM

SECTION 26 09 25

WIRELESS LIGHTING CONTROL SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Single space wireless lighting control systems and associated components:
 - 1. Wireless occupancy/vacancy sensors.
 - 2. Wireless daylight sensors.
 - 3. Wired load control modules with wireless communication inputs.
 - a. Includes fixture control modules with wired occupancy/vacancy/daylight sensors.
 - 4. Wired wall dimmers and switches with wireless communication inputs.
 - 5. Wireless control stations.
- B. Wireless hub(s) for centralized control, monitoring, and system integration.

1.02 RELATED REQUIREMENTS

- A. Section 26 05 53 Identification for Electrical Systems: Identification products and requirements.
- B. Section 26 27 26 Wiring Devices Lutron:
 - 1. Finish requirements for wall controls specified in this section.
 - 2. Accessory receptacles and wall plates, to match lighting controls specified in this section.

1.03 REFERENCE STANDARDS.

- A. CSA C22.2 No. 223 Power Supplies with Extra-low-voltage Class 2 Outputs; 2015.
- B. IEC 60929 AC and/or DC-Supplied Electronic Control Gear for Tubular Fluorescent Lamps Performance Requirements; 2015.
- C. IEC 61000-4-2 Electromagnetic Compatibility (EMC) Part 4-2: Testing and Measurement Techniques Electrostatic Discharge Immunity Test; 2008.
- D. IEEE C62.41.2 Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits; 2002 (Cor 1, 2012).
- E. ISO 9001 Quality Management Systems-Requirements; 2008.
- F. NECA 1 Standard for Good Workmanship in Electrical Construction; 2010.
- G. NECA 130 Standard for Installing and Maintaining Wiring Devices; National Electrical Contractors Association; 2010.
- NEMA 410 Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts; National Electrical Manufacturers Association; 2011.

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- I. NEMA WD 1 General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2010).
- J. NFPA 70 National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. UL 20 General-Use Snap Switches; Current Edition, Including All Revisions.
- L. UL 508 Industrial Control Equipment; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.
- M. UL 924 Emergency Lighting and Power Equipment; Current Edition, Including All Revisions.
- N. UL 935 Fluorescent-Lamp Ballasts; Current Edition, Including All Revisions.
- O. UL 1310 Class 2 Power Units; Current Edition, Including All Revisions.
- P. UL 1472 Solid-State Dimming Controls; Current Edition, Including All Revisions.
- Q. UL 1598C Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits; Current Edition, Including All Revisions.
- R. UL 2043 Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces; Current Edition, Including All Revisions.
- S. UL 8750 Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the placement of sensors and wall controls with millwork, furniture, equipment, etc. installed under other sections or by others.
 - 2. Coordinate the placement of wall controls with actual installed door swings.
 - 3. Coordinate the placement of daylight sensors with windows, skylights, and luminaires to achieve optimum operation. Coordinate placement with ductwork, piping, equipment, or other potential obstructions to light level measurement installed under other sections or by others.
 - 4. Coordinate the work to provide luminaires and lamps compatible with the lighting controls to be installed.
 - 5. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.
- B. Pre-Wire Meeting; *Lutron LSC-PREWIRE*: Include as part of the bid; additional costs for Lighting Control Manufacturer to conduct on-site meeting prior to commencing work. Manufacturer to review with installer:
 - 1. Low voltage wiring requirements.
 - 2. Separation of power and low voltage/data wiring.
 - 3. Wire labeling.
 - 4. Wireless hub locations and installation.
 - 5. Where Lighting Control Manufacturer Sensor Layout and Tuning service is specified in Part 2 under "LIGHTING CONTROLS GENERAL REQUIREMENTS", sensor

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locations to be reviewed in accordance with layout provided by Lighting Control Manufacturer. Lighting Control Manufacturer may direct Contractor regarding sensor relocation should conditions require a deviation from locations indicated.

- 6. Control locations.
- 7. Computer jack locations.
- 8. Load circuit wiring.
- 9. Network wiring requirements.
- 10. Connections to other equipment.
- 11. Installer responsibilities.
- C. Sequencing:
 - 1. Do not install sensors and wall controls until final surface finishes are complete.

1.05 SUBMITTALS

- A. Product Data: Include ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
 - 1. Occupancy/Vacancy Sensors: Include detailed basic motion detection coverage range diagrams.
 - 2. Wall Dimmers: Include derating information for ganged multiple devices.
- B. Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- C. Project Record Documents: Record actual installed locations and settings for lighting control system components.
- D. Operation and Maintenance Data: Include detailed information on lighting control system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.
- E. Warranty: Submit sample of manufacturer's Warranty or Enhanced Warranty as specified in Part 1 under "WARRANTY". Submit documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Manufacturer Qualifications:
 - 1. Company with not less than ten years of experience manufacturing lighting control products using wireless communication between devices.
 - 2. Registered to ISO 9001, including in-house engineering for product design activities.
 - 3. Provides factory direct technical support hotline available 24 hours per day, 7 days per week.
 - 4. Qualified to supply specified products and to honor claims against product presented in accordance with warranty.
1.07 DELIVERY, STORAGE, AND HANDLING

A. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

1.08 FIELD CONDITIONS

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.
 - 1. Basis of Design System Requirements Lutron, Unless Otherwise Indicated:
 - a. Ambient Temperature:
 - Lighting Control System Components, Except Fluorescent Electronic Dimming Ballasts: Between 32 and 104 degrees F (0 and 40 degrees C).
 - Fluorescent Electronic Dimming Ballasts: Between 50 and 140 degrees F (10 and 60 degrees C).
 - b. Relative Humidity: Less than 90 percent, non-condensing.
 - c. Protect lighting controls from dust.

1.09 WARRANTY

- A. See Section 01 7800 Closeout Submittals, for additional warranty requirements.
- B. Manufacturer's Standard Warranty, With Manufacturer Full-Scope Start-Up; Lutron Standard 2-Year Warranty; Lutron LSC-B2:
 - 1. Manufacturer Lighting Control System Components, Except Lighting Management System Computer, Ballasts/Drivers and Ballast Modules:
 - a. First Two Years:
 - 1) 100 percent replacement parts coverage, 100 percent manufacturer labor coverage to troubleshoot and diagnose a lighting issue.
 - 2) First-available on-site or remote response time.
 - 3) Remote diagnostics for applicable systems.
 - b. Telephone Technical Support: Available 24 hours per day, 7 days per week, excluding manufacturer holidays.
 - 2. Lighting Management System Computer: One year 100 percent parts coverage, one year 100 percent manufacturer labor coverage.
 - 3. Ballasts/Drivers and Ballast Modules:
 - a. With On-Site Full-Scope Start-Up: Five years 100 percent parts coverage, no manufacturer labor coverage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer: Lutron Electronics Company, Inc; Vive; www.lutron.com.

- B. Substitutions: Any proposed substitution must be submitted a minimum of 10 days prior to the bid. Any proposed substitution must be fully demonstrated to owner and architect/ engineer prior to the bid to insure that the proposed system functions at the same level as the specified system and will integrate with the building automation system in a functionally and practically equivalent manner to the specified system. Any system or component that has not been demonstrated to the full satisfaction of the owner and architect/ engineer or has not been deemed acceptable by the owner and architect/ engineer prior to the bid will not be accepted. The Owner and architect/ engineer reserves the right to reject and deny any substitution that it may, in its sole discretion, deem unequal, and the findings in this regard shall be accepted by the bidder as final and binding.
- B. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.
- C. Crestron lighting control system is an approved equal to the specified system

2.02 LIGHTING CONTROLS - GENERAL REQUIREMENTS

- B. Provide products listed, classified, and labeled by Underwriter's Laboratories Inc. (UL) as suitable for the purpose indicated.
- C. Unless specifically indicated to be excluded, provide all required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, programming, etc. as necessary for a complete operating system that provides the control intent indicated.
- D. Design lighting control equipment for 10 year operational life while operating continually at any temperature in an ambient temperature range of 32 degrees F (0 degrees C) to 104 degrees F (40 degrees C) and 90 percent non-condensing relative humidity.
- E. Electrostatic Discharge Tolerance: Design and test equipment to withstand electrostatic discharges without impairment when tested according to IEC 61000-4-2.
- F. Wireless Devices:
 - 1. Wireless device family includes area or fixture level sensors, area or fixture level load controls for dimming or switching, and load controls that can be mounted in a wallbox, on a junction box, or at the fixture.
 - 2. Wireless devices including sensors, load controls, and wireless remotes or wall stations, can be set up using simple button press programming without needing any other equipment (e.g. central hub, processor, computer, or other smart device).
 - 3. Wireless hub adds the ability to set up the system using any smart device with a web browser (e.g. smartphone, tablet, PC, or laptop).
 - 4. System does not require a factory technician to set up or program the system.
 - 5. Capable of diagnosing system communications.
 - 6. Capable of having addresses automatically assigned to them.
 - 7. Receives signals from other wireless devices and provides feedback to user.
 - 8. Capable of determining which devices have been addressed.
 - 9. RF Range: 60 feet (18 m) line-of-sight or 30 feet (9 m) through typical construction materials between RF transmitting devices and compatible RF receiving devices.
 - 10. Electromagnetic Interference/Radio Frequency Interference (EMI/RFI) Limits: Comply with FCC requirements of CFR, Title 47, Part 15, for Class B application.
- G. Wireless Network:

- 1. RF Frequency: 434 MHz; operate in FCC governed frequency spectrum for periodic operation; continuous transmission spectrum is not permitted.
 - a. Wireless sensors, wireless wall stations and wireless load control devices do not operate in the noisy 2.4 GHz frequency band where high potential for RF interference exists.
 - b. Wireless devices operate in an uncongested frequency band providing reliable operation.
 - c. Fixed network architecture ensures all associated lights and load controls respond in a simultaneous and coordinated fashion from a button press, sensor signal, or command from the wireless hub (i.e. no popcorning).
- 2. Distributed Architecture: Local room devices communicate directly with each other. If the wireless hub is removed or damaged, local control, sensing, and operation continues to function without interruption.
- 3. Local room devices communicate directly with each other (and not through a central hub or processor) to ensure:
 - a. Reliability of system performance.
 - b. Fast response time to events in the space (e.g. button presses or sensor signals).
 - c. Independent operation in the event of the wireless hub being removed or damaged.
- H. Device Finishes:
 - 1. Wall Controls: Color to be selected by Architect.
 - 2. Visible Parts: Exhibit ultraviolet color stability when tested with multiple actinic light sources as defined in ASTM D4674. Provide proof of testing upon request.

2.03 WIRELESS SENSORS

- B. General Requirements:
 - 1. Operational life of 10 years without the need to replace batteries when installed per manufacturer's instructions.
 - 2. Communicates directly to compatible RF receiving devices through use of a radio frequency communications link.
 - 3. Does not require external power packs, power wiring, or communication wiring.
 - 4. Capable of being placed in test mode to verify correct operation from the face of the unit.
- C. Wireless Occupancy/Vacancy Sensors:
 - 1. General Requirements:
 - a. Provides a clearly visible method of indication to verify that motion is being detected during testing and that the unit is communicating to compatible RF receiving devices.
 - b. Utilize multiple segmented lens, with internal grooves to eliminate dust and residue build-up.

- c. Sensing Mechanism: Passive infrared coupled with technology for sensing fine motions; *Lutron XCT Technology*. Signal processing technology detects fine-motion passive infrared (PIR) signals without the need to change the sensor's sensitivity threshold.
- d. Provide optional, readily accessible, user-adjustable controls for timeout, automatic/manual-on, and sensitivity.
- e. Turns off lighting after reasonable and adjustable time delay once the last person to occupy the space vacates a room or area. Provide adjustable timeout settings of 1, 5, 15, and 30 minutes.
- f. Capable of turning dimmer's lighting load on to an optional locked preset level selectable by the user. Locked preset range to be selectable on the dimmer from 1 percent to 100 percent.
- g. Color: White.
- h. Provide all necessary mounting hardware and instructions for both temporary and permanent mounting.
- i. Provide temporary mounting means for drop ceilings to allow user to check proper performance and relocate as needed before permanently mounting sensor. Temporary mounting method to be design for easy, damage-free removal.
- j. Sensor lens to illuminate during test mode when motion is detected to allow installer to place sensor in ideal location and to verify coverage prior to permanent mounting.
- k. Ceiling-Mounted Sensors:
 - 1) Provide surface mounting bracket compatible with drywall, plaster, wood, concrete, and compressed fiber ceilings.
 - 2) Provide recessed mounting bracket compatible with drywall and compressed fiber ceilings.
- I. Wall-Mounted Sensors: Provide wall or corner mounting brackets compatible with drywall and plaster walls.
- 2. Wireless Combination Occupancy/Vacancy Sensors:
 - a. Ceiling-Mounted Sensors: Programmable to operate as an occupancy sensor (automatic-on and automatic-off), an occupancy sensor with low light feature (automatic-on when less than one footcandle of ambient light available and automatic-off), or a vacancy sensor (manual-on and automatic-off).
 - b. Wall-Mounted Sensors: Programmable to operate as an occupancy sensor (automatic-on and automatic-off), or a vacancy sensor (manual-on and automatic-off).
 - c. Product(s):
 - Ceiling-Mounted Occupancy/Vacancy Sensor; Lutron Radio Powr Savr Series, Model LFR2-OCR2B-P-WH Coverage from 324 square feet (30.2 sq m) to 676 square feet (62.4 sq m) depending on ceiling height from 8 to 12 feet (2.4 to 3.7 m); 360 degree field of view.
 - 2) Wall-Mounted Occupancy/Vacancy Sensor; Lutron Radio Powr Savr Series, Model LFR2-OWLB-P-WH Minor motion coverage of 1500

square feet (139.4 sq m) and major motion coverage of 3000 square feet (278.7 sq m) with mounting height of 6 to 8 feet (1.8 to 2.4 m); 180 degree field of view.

- 3) Corner-Mounted Occupancy/Vacancy Sensor; Lutron Radio Powr Savr Series, Model LFR2-OKLB-P-WH Minor motion coverage of 1225 square feet (113.8 sq m) and major motion coverage of 2500 square feet (232.3 sq m) with mounting height of 6 to 8 feet (1.8 to 2.4 m); 90 degree field of view.
- 4) Hallway Occupancy/Vacancy Sensor; Lutron Radio Powr Savr Series, Model LFR2-OHLB-P-WH Major motion coverage of up to 150 feet (45.7 m) with mounting height of 6 to 8 feet (1.8 to 2.4 m); narrow field of view.

2.04 LOAD CONTROL MODULES

- B. Provide wireless load control modules as indicated or as required to control the loads as indicated.
- C. Junction Box-Mounted Modules:
 - 1. Relay Modules:
 - a. Product(s):
 - 1) 16 A relay module, without contact closure output; Lutron PowPak Relay Module Model RMJS-16R-DV-B
 - 2) 5 A relay module, without contact closure output; *Lutron PowPak Relay Module Model RMJS-5R-DV-B*.
 - b. Communicates via radio frequency with up to ten compatible occupancy/vacancy sensors, ten wireless control stations, and one daylight sensor.
 - c. Relay:
 - 1) Rated Life of Relay: Typical of 1,000,000 cycles at fully rated 16 A for all lighting loads.
 - 2) Load switched in manner that prevents arcing at mechanical contacts when power is applied to and removed from load circuits.
 - 3) Fully rated output continuous duty for inductive, capacitive, and resistive loads.

2.05 WIRELESS CONTROL STATIONS

- B. Product(s):
 - 1. 2-Button Control; Lutron Pico Wireless Control Model PJ2-2B.
 - 2. 4-Button Control; Lutron Pico Wireless Control Model PJ2-4B
 - 3. Wallbox Adapter; *Lutron Model PICO-WBX-ADAPT*.
- C. Communicates directly to compatible RF receiving devices through use of a radio frequency communications link.
- D. Does not require external power packs, power or communication wiring.
- E. Allows for easy reprogramming without replacing unit.

- F. Button Programming:
 - 1. Single action.
 - 2. Toggle action.
- G. Includes LED to indicate button press or programming mode status.
- H. Mounting:
 - 1. Capable of being mounted with a table stand or directly to a wall under a faceplate.
 - 2. Faceplates: Provide concealed mounting hardware.
- I. Power: Battery-operated with minimum ten-year battery life (3-year battery life for night light models).
- J. Finish: To be selected by Architect.

2.06 WIRELESS HUBS

- B. Product(s):
 - 1. Wireless hub with BACnet; Lutron Vive Premium Hub.
 - a. Surface-mount wireless hub; Model HJS-2-SM.
- C. Integrated multicolor LED provides feedback on what mode the hub is in for simple identification and diagnosis.
- D. Integrated processor and web server allows hub to set up and operate the system without any external connections to outside processors, servers, or the internet.
- E. Utilizes Ethernet connection for:
 - 1. Networking up to 64 hubs together to create a larger system.
 - 2. Integration with Building Management System (BMS) via native BACnet; does not require interface (*Lutron Vive Premium* wireless hub with BACnet only).
 - 3. Remote connectivity capabilities, including maintaining system date/time and receiving periodic firmware updates (requires internet connection).
- F. A single hub or network of hubs can operate on either a dedicated lighting control only network or can be integrated with an existing building network as a VLAN.
- G. Communicates directly to compatible *Lutron Vive* RF devices through use *Lutron Clear Connect* radio frequency communications link; does not require communication wiring; RF range of 71 feet (23 m) through walls to cover an area of 15836 square feet (1471 sq m) (device and hub must be on the same floor).
- H. Communicates directly to mobile device (smartphone or tablet) or computer using built-in Wi-Fi, 2.4 GHz 802.11b/g; wireless range of 71 feet (23 m) through walls (device and hub must be on the same floor).
 - 1. Does not require external Wi-Fi router for connecting to the hub.
- I. Allows for system setup, control, and monitoring from mobile device or computer using *Vive Vue* web-based software:
 - 1. Supports up to 700 total paired devices including compatible wireless sensors, wireless control stations, and wireless load devices.
 - 2. Allows for timeclock scheduling of events, both time of day and astronomic (sunrise and sunset).

- a. Timeclock is integrated into the unit and does not require a constant internet connection.
- b. Retains time and programming information after a power loss.
- 3. Allows for control, monitoring, and adjustment from anywhere in the world (*Lutron Vive* wireless hub internet connection required).
- 4. Uses RF signal strength detection to find nearby devices for quick association and programming without having to climb ladders.
 - a. Association and setup does not require a factory technician to perform.
- 5. System using *Lutron Vive* wireless hub(s) can operate with or without connection to the internet.
- 6. Supports energy reporting.
 - a. Reports measured energy data for *PowPak* fixture control modules at accuracy of plus/minus 2 percent or 0.5 W (whichever is higher).
 - b. Reports calculated energy data for *PowPak* junction box mounted modules at accuracy of 10 percent.
- 7. Supports automatic demand response for load shedding via:
 - a. Local contact closure without need for separate interface.
 - b. BACnet (Lutron Vive Premium wireless hub with BACnet only).
- 8. Wireless hub can be firmware upgraded to provide new software features and system updates.
 - a. Firmware update can be done either locally using a wired Ethernet connection or Wi-Fi connection, or remotely if the wireless hub is connected to the internet.
- J. *Lutron Vive Vue* Web-Based Application:
 - 1. Accessibility and Platform Support:
 - a. Web-based; runs on most HTML5 compatible browsers (including Safari and Chrome).
 - b. Supports multiple platforms and devices; runs from a tablet, desktop, laptop, or smartphone.
 - c. User interface supports multi-touch gestures such as pinch to zoom, drag to pan, etc.
 - d. Utilizes HTTPS (industry-standard certificate-based encryption and authentication for security).
 - e. Multi-level Password Protected Access: Individual password protection on both the integrated Wi-Fi network and web-based software.
 - f. WPA2 security for Wi-Fi communication with wireless hub.
 - 2. System Navigation and Status Reporting:
 - a. Area Tree View: Easy navigation by area name to view status and make programing adjustments through the software.
 - b. Area and device names can be changed in real time.
- K. BACnet Integration (Lutron Vive Premium wireless hub with BACnet only):

- 1. Provide ability to communicate by means of native BACnet IP communication (does not require interface) to lighting control system from a user-supplied 10BASE-T or 100BASE-T Ethernet network.
- 2. Requires only one network connection per hub.
- 3. BACnet Integrator Capabilities:
 - a. The BACnet integrator can command:
 - 1) Area light output.
 - 2) Area load shed level.
 - 3) Area load shed enable/disable.
 - 4) Enable/Disable:
 - (a) Area occupancy sensors.
 - (b) Area daylighting.
 - 5) Daylighting level.
 - 6) Area occupied and unoccupied level
 - 7) Occupancy sensor timeouts (for fixture sensors).
 - b. The BACnet integrator can monitor:
 - 1) Area on/off status.
 - 2) Area occupancy status.
 - 3) Area load shed status.
 - 4) Area instantaneous energy usage and maximum potential power usage.
 - 5) Enable/Disable:
 - (a) Area occupancy sensors.
 - (b) Daylighting.
 - (c) Timeclocks.
 - 6) Daylighting level.
 - 7) Light levels from photo sensors.
 - 8) Area occupied and unoccupied level.
 - 9) Occupancy sensor timeouts.
- L. Contact Closure Interface: Provide two contact closure inputs; accepts both momentary and maintained contact closures that can be used for automatic demand response.
- M. Rated for use in air-handling spaces as defined in UL 2043.
- N. Meets CAL TITLE 24 P6 requirements.

2.07 SOURCE QUALITY CONTROL

- B. See Section 01 4000 Quality Requirements, for additional requirements.
- C. Factory Testing; Lutron Standard Factory Testing:

- 1. Perform full-function factory testing on all completed assemblies. Statistical sampling is not acceptable.
- 2. Perform full-function factory testing on 100 percent of all ballasts and LED drivers.
- 3. Perform factory burn-in of 100 percent of all ballasts at 104 degrees F (40 degrees C).

PART 3 EXECUTION

3.01 EXAMINATION

- B. Verify that field measurements are as shown on the drawings.
- C. Verify that ratings and configurations of system components are consistent with the indicated requirements.
- D. Verify that mounting surfaces are ready to receive system components.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- B. Perform work in a neat and workmanlike manner in accordance with NECA 1 and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- C. Lighting Control Manufacturer Sensor Layout and Tuning service may be specified in Part 2 under "LIGHTING CONTROLS GENERAL REQUIREMENTS".
 - Where Lighting Control Manufacturer Sensor Layout and Tuning service is specified in Part 2 under "LIGHTING CONTROLS - GENERAL REQUIREMENTS", locate sensors in accordance with layout provided by Lighting Control Manufacturer. Lighting Control Manufacturer may direct Contractor regarding sensor relocation should conditions require a deviation from locations indicated. Where Lighting Control Manufacturer Sensor Layout and Tuning service is not specified, locate sensors in accordance with Drawings.
 - 2. Sensor locations indicated are diagrammatic. Within the design intent, reasonably minor adjustments to locations may be made in order to optimize coverage and avoid conflicts or problems affecting coverage, in accordance with manufacturer's recommendations.
- D. Ensure that daylight sensor placement minimizes sensor view of electric light sources. Locate ceiling-mounted and luminaire-mounted daylight sensors to avoid direct view of luminaires.
- E. Lamp Burn-In: Operate lamps at full output for prescribed period per manufacturer's recommendations prior to use with any dimming controls. Replace lamps that fail prematurely due to improper lamp burn-in.
- F. Lamp Lead Lengths: Do not exceed 3 feet (0.9 m) for T4 4-pin compact and T5 BIAX lamps and 7 feet (2.1 m) for T5, T5-HO, T8 U-bend, and T8 linear fluorescent lamps.
- G. LED Light Engine/Array Lead Length: Do not exceed 100 feet (31 m).
- H. Identify system components in accordance with Section 26 05 53.

3.03 FIELD QUALITY CONTROL

B. See Section 01 4000 - *Quality Requirements*, for additional requirements.

- C. Manufacturer's Full-Scope Start-Up Service is required.
- D. Manufacturer's Programming Service:
 - 1. Product(s):
 - a. On-site programming, 8-hour block; Lutron LSC-OS-PROG8-SP.
- E. Manufacturer's Full-Scope Start-Up Service: Provide Manufacturers On-Site Full-Scope Start-Up.
 - 1. On-Site Full-Scope Start-Up Service; *Lutron LSC-OS-SU-VIVE*: Manufacturer's authorized Service Representative to conduct site visit upon completion of lighting control system installation to perform system startup and verify proper operation:
 - a. Where Lighting Control Manufacturer Sensor Layout and Tuning service is specified in Part 2 under "LIGHTING CONTROLS - GENERAL REQUIREMENTS", authorized Service Representative to verify sensor locations, in accordance with layout provided by Lighting Control Manufacturer; Lighting Control Manufacturer may direct Contractor regarding sensor relocation should conditions require a deviation from locations indicated.
 - b. Verify connection of power wiring and load circuits.
 - c. Verify connection and location of controls.
 - d. Energize wireless hubs.
 - e. Associate occupancy/vacancy sensors, daylight sensors, wireless remotes, and wall stations to load control devices.
 - f. Provide initial rough calibration of sensors; fine-tuning of sensors is responsibility of Contractor unless provided by Lighting Control Manufacturer as part of Sensor Layout and Tuning service where specified in Part 2 under "LIGHTING CONTROLS - GENERAL REQUIREMENTS".
 - g. Program timeclock schedules per approved sequence of operations.
 - h. Configure load shed parameters per approved sequence of operations.
 - i. Verify system operation control by control.
 - j. Obtain sign-off on system functions.
 - k. Train Owner's representative on system capabilities, operation, and maintenance, as specified in Part 3 under "Closeout Activities".
- F. Correct defective work, adjust for proper operation, and retest until entire system complies with contract documents.

3.04 CLEANING

B. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.05 TESTING

B. Title 24 Acceptance Testing Service; *Lutron LSC-SPV-DOC-T24*: Include as part of the bid, Lighting Control Manufacturer to perform lighting control acceptance testing.

3.06 CLOSEOUT ACTIVITIES

- B. See Section 01 7800 Closeout Submittals, for closeout submittals.
- C. See Section 01 7900 Demonstration and Training, for additional requirements.
- D. Demonstration:
 - 1. Demonstrate proper operation of lighting control devices to facility representative, and correct deficiencies or make adjustments as directed.
 - 2. On-Site Performance-Verification Walkthrough; *Lutron LSC-WALK*: Include as part of the bid additional costs for lighting control manufacturer to provide on-site demonstration of system functionality to facility representative.
- E. Training:
 - 1. Include services of manufacturer's certified service representative to perform on-site training of Owner's personnel on operation, adjustment, and maintenance of lighting control system as part of on-site system start-up services.
 - 2. Customer-Site Solution Training Visit; *Lutron LSC-TRAINING-SP*: Include as part of the bid additional costs for Lighting Control Manufacturer to provide one day (of additional on-site system training.

3.07 PROTECTION

B. Protect installed products from subsequent construction operations.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

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. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. Twist-locking receptacles.
 - 3. Receptacles with integral surge-suppression units.
 - 4. Tamper-resistant receptacles.
 - 5. Weather-resistant receptacles.
 - 6. Snap switches and wall-box dimmers.
 - 7. Wall-switch and exterior occupancy sensors.
 - 8. Communications outlets.
 - 9. Pendant cord-connector devices.
 - 10. Cord and plug sets.
 - 11. Floor service outlets, poke-through assemblies, service poles, and multi-outlet assemblies.

1.3 **DEFINITIONS**

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.
- E. UTP: Unshielded twisted pair.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Receptacles for Owner-Furnished Equipment: Match plug configurations.
 - 2. Cord and Plug Sets: Match equipment requirements.
 - 3. Coordinate all device colors in writing with Architect/Engineer prior to submittal process and provide approval with submittals for devices.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. Samples: One for each type of device and wall plate specified, in each color specified.

1.6 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packinglabel warnings and instruction manuals that include labeling conditions.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Service/Power Poles: One for every 10, but no fewer than one.
 - 2. Floor Service-Outlet Assemblies: One for every 10, but no fewer than one.
 - 3. Poke-Through, Fire-Rated Closure Plugs: One for every five floor service outlets installed, but no fewer than two.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 - 1. Cooper Wiring Devices; Division of Cooper Industries, Inc. (Cooper).
 - 2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
 - 3. Leviton Mfg. Company Inc. (Leviton).
 - 4. Pass & Seymour/Legrand (Pass & Seymour).
- B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.
- C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
 - 1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
 - 2. Devices shall comply with the requirements in this Section.

2.3 STRAIGHT-BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
 - 1. Products: Subject to compliance with requirements, provide one of the following:

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- a. Cooper; 5351 (single), CR5362 (duplex).
- b. Hubbell; HBL5351 (single), HBL5352 (duplex).
- c. Leviton; 5891 (single), 5352 (duplex).
- d. Pass & Seymour; 5361 (single), 5362 (duplex).
- B. Tamper-Resistant Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498 Supplement sd, and FS W-C-596.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; TR8300.
 - b. Hubbell; HBL8300SGA.
 - c. Leviton; 8300-SGG.
 - d. Pass & Seymour; TR63H.

2.4 GFCI RECEPTACLES

- A. General Description:
 - 1. Straight blade, feed-through type.
 - 2. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596.
 - 3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.
- B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; VGF20.
 - b. Hubbell; GFR5352L.
 - c. Pass & Seymour; 2095.
 - d. Leviton; 7590.
- C. Tamper- and Weather-Resistant, GFCI Duplex Receptacles, 125 V, 20 A :
 - 1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
 - 2. Configuration: NEMA WD 6, Configuration 5-15R.
 - 3. Type: Non feed-through.
 - 4. Standards: Comply with UL 498 and UL 943 Class A.
 - 5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.
- D. Tamper-Resistant GFCI Convenience Receptacles, 125 V, 20 A:
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Hubbell; GFTR20.
 - b. Pass & Seymour; 2095TR.

2.5 USB RECEPTACLES

A. USB Charging Receptacles :

- 1. Description: Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickelplated, brass mounting strap.
- 2. USB Receptacles: **Dual**, USB Type A, 5 V dc, and 2.1 A per receptacle (minimum).
- 3. Standards: Comply with UL 1310 and USB 3.0 devices.

2.6 TWIST-LOCKING RECEPTACLES

- A. Single Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration L5-20R, and UL 498.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; CWL520R.
 - b. Hubbell; HBL2310.
 - c. Leviton; 2310.
 - d. Pass & Seymour; L520-R.

2.7 CORD AND PLUG SETS

- A. Description:
 - 1. Match voltage and current ratings and number of conductors to requirements of equipment being connected.
 - 2. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and ampacity of at least 130 percent of the equipment rating.
 - 3. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.8 TOGGLE SWITCHES

- A. Comply with NEMA WD 1, UL 20, and FS W-S-896.
- B. Switches, 120/277 V, 20 A:
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Single Pole:
 - 1) Cooper; AH1221.
 - 2) Hubbell; HBL1221.
 - 3) Leviton; 1221-2.
 - 4) Pass & Seymour; CSB20AC1.
 - b. Two Pole:
 - 1) Cooper; AH1222.
 - 2) Hubbell; HBL1222.
 - 3) Leviton; 1222-2.
 - 4) Pass & Seymour; CSB20AC2.
 - c. Three Way:
 - 1) Cooper; AH1223.
 - 2) Hubbell; HBL1223.
 - 3) Leviton; 1223-2.
 - 4) Pass & Seymour; CSB20AC3.

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- d. Four Way:
 - 1) Cooper; AH1224.
 - 2) Hubbell; HBL1224.
 - 3) Leviton; 1224-2.
 - 4) Pass & Seymour; CSB20AC4.
- C. Single-Pole, Double-Throw, Momentary-Contact, Center-off Switches: 120/277 V, 20 A; for use with mechanically held lighting contactors.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 1995.
 - b. Hubbell; HBL1557.
 - c. Leviton; 1257.
 - d. Pass & Seymour; 1251.

2.9 WALL PLATES

- A. Single and combination types shall match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: 302 Stainless steel.
 - 3. Material for Unfinished Spaces: Galvanized steel.
 - 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weatherresistant, die-cast aluminum with lockable cover.

2.10 FLOOR SERVICE FITTINGS

- A. Type: Modular, flush-type activation or recess-type activation, as scheduled on the plans.
- B. Compartments: Barrier separates power from voice and data communication cabling.
- C. Service Plate: As called for on the Plans.
- D. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.
- E. Voice and Data Communication Outlet: Modular, keyed, color-coded, RJ-45 jacks (quantity as shown on plans) for UTP cable complying with requirements in Section 269000 "Structured Cabling System."

2.11 FINISHES

- A. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
 - 2. Wiring Devices Connected to Emergency Power System: Red.
- B. Wall Plate Color: For plastic covers, match device color as selected by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:

- 1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
- 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
- 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
- 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
 - 1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
 - 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 - 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
 - 4. Existing Conductors:
 - a. Cut back and pigtail or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pig tailing existing conductors is permitted, provided the outlet box is large enough.
- D. Device Installation:
 - 1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 - 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 - 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 - 4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
 - 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
 - 6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
 - 7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
 - 8. Tighten unused terminal screws on the device.
 - 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
- E. Receptacle Orientation:
 - 1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the left.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

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- G. Dimmers:
 - 1. Install dimmers within terms of their listing.
 - 2. Verify that dimmers used for fan speed control are listed for that application.
 - 3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.
- H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multi-gang wall plates.
- I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

- A. Comply with Section 26 05 53 "Identification for Electrical Systems."
- B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Test Instruments: Use instruments that comply with UL 1436.
 - 2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- B. Tests for Convenience Receptacles:
 - 1. Line Voltage: Acceptable range is 105 to 132 V.
 - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 - 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 - 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
- C. Wiring device will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION

SECTION 26 28 16 ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Fusible switches.
 - 2. Non-fusible switches.
 - 3. Shunt trip switches.
 - 4. Molded-case circuit breakers (MCCBs).
 - 5. Enclosures.

1.3 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
 - 1. Enclosure types and details for types other than NEMA 250, Type 1.
 - 2. Current and voltage ratings.
 - 3. Short-circuit current ratings (interrupting and withstand, as appropriate).
 - 4. Include evidence of NRTL listing for series rating of installed devices.
 - 5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
 - 6. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.
- B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Wiring Diagrams: For power, signal, and control wiring.

1.5 MAINTENANCE MATERIAL SUBMITTALS

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

- 1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
- 2. Fuse Pullers: Two for each size and type.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.
- B. Product Dimensions: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Comply with NFPA 70.

1.7 COORDINATION

- A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Provide mounting structure for safety switches independent of the equipment and install flexible connection from switch to equipment as required.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.
- B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 - 3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
 - 4. Lugs: Mechanical type, suitable for number, size, and conductor material.

2.2 NON-FUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
- 2. General Electric Company; GE Consumer & Industrial Electrical Distribution.
- 3. Siemens Energy & Automation, Inc.
- 4. Square D; a brand of Schneider Electric.
- B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 - 2. Lugs: Mechanical type, suitable for number, size, and conductor material.

2.3 SHUNT TRIP SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper Bussmann, Inc.
 - 2. Ferraz Shawmut, Inc.
 - 3. Littelfuse, Inc.
- B. Switches: Three-pole, horsepower rated, with integral shunt trip mechanism and Class J fuse block; lockable handle with capability to accept three padlocks; interlocked with cover in closed position.
- C. Control Circuit: 120-V ac; obtained from integral control power transformer, with primary and secondary fuses, with a control power transformer of enough capacity to operate shunt trip, connected pilot, and indicating and control devices.
- D. Accessories:
 - 1. Oiltight key switch for key-to-test function.
 - 2. Oiltight green ON pilot light.
 - 3. Isolated neutral lug; 100 percent rating.
 - 4. Mechanically interlocked auxiliary contacts that change state when switch is opened and closed.
 - 5. Form C alarm contacts that change state when switch is tripped.
 - 6. Three-pole, double-throw, fire-safety and alarm relay; 24-V dc coil voltage.
 - 7. Three-pole, double-throw, fire-alarm voltage monitoring relay complying with NFPA 72.

2.4 MOLDED-CASE CIRCUIT BREAKERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 - 2. General Electric Company; GE Consumer & Industrial Electrical Distribution.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D; a brand of Schneider Electric.

- B. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.
- C. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
- D. Features and Accessories:
 - 1. Standard frame sizes, trip ratings, and number of poles.
 - 2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
 - 3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.

2.5 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
 - 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 - 2. Outdoor Locations: NEMA 250, Type 3R.
 - 3. Kitchen and Wash-Down Areas: NEMA 250, Type 4X, stainless steel.
 - 4. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
 - 5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- C. Install fuses in fusible devices.
- D. Comply with NECA 1.

3.3 IDENTIFICATION

- A. Comply with requirements in Section 26 05 53 "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection (only) test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - 3. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.
- B. Set field-adjustable circuit-breaker trip ranges as specified in Section 26 05 73 "Electrical System Studies"

END OF SECTION

SECTION 26 51 00 INTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior lighting fixtures, lamps, and ballasts.
 - 2. Emergency lighting units.
 - 3. Exit signs.
 - 4. Lighting fixture supports.
- B. Related Sections:
 - 1. Section 26 27 26 "Wiring Devices" for manual wall-box dimmers LED fixtures/drivers.
 - 2. Section 26 09 23 "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multi-pole lighting relays and contactors.

1.3 **DEFINITIONS**

- A. CCT: Correlated color temperature.
- B. CRI: Color-rendering index.
- C. HID: High-intensity discharge.
- D. LER: Luminaire efficacy rating.
- E. Lumen: Measured output of lamp and luminaire, or both.
- F. Luminaire: Complete lighting fixture, including ballast housing if provided.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:
 - 1. Physical description of lighting fixture including dimensions.
 - 2. Emergency lighting units including battery and charger.
 - 3. Ballast, including BF.
 - 4. Energy-efficiency data.
 - 5. Sound Performance Data: For air-handling lighting fixtures. Indicate sound power level and sound transmission class in test reports certified according to standards specified elsewhere in these specifications "Diffusers, Registers, and Grilles."
 - 6. Life, output (lumens, CCT, and CRI), and energy-efficiency data for lamps.

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- 7. Photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing & Calculation Guides, of each lighting fixture type. The adjustment factors shall be for lamps, ballasts, and accessories identical to those indicated for the lighting fixture as applied in this Project.
 - a. Manufacturer Certified Data: Photometric data shall be certified by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
- B. Shop Drawings: For nonstandard or custom lighting fixtures. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Wiring Diagrams: For power, signal, and control wiring.
- C. Installation instructions.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Lighting fixtures.
 - 2. Suspended ceiling components.
 - 3. Partitions and millwork that penetrate the ceiling or extends to within 12 inches of the plane of the luminaires.
 - 4. Ceiling-mounted projectors.
 - 5. Structural members to which suspension systems for lighting fixtures will be attached.
 - 6. Other items in finished ceiling including the following:
 - a. Air outlets and inlets.
 - b. Speakers.
 - c. Sprinklers.
 - d. Smoke and fire detectors.
 - e. Occupancy sensors.
 - f. Photo-sensors.
 - g. Access panels.
 - h. Ceiling projector mounts.
 - i. Ceiling mounted surveillance cameras.
 - 7. Perimeter moldings.
- B. Qualification Data: For qualified agencies providing photometric data for lighting fixtures.
- C. Product Certificates: For each type of ballast for bi-level and dimmer-controlled fixtures, from manufacturer.
- D. Field quality-control reports.
- E. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For lighting equipment and fixtures to include in emergency, operation, and maintenance manuals.
 - 1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fixtures: 10 for every 100 of each type and rating installed. Furnish at least one of each type.
 - 2. LED drivers: 10 for every 100 of each type and rating installed. Furnish at least one of each type.

1.8 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NFPA 70.
- D. FM Global Compliance: Lighting fixtures for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
 - 1. Approved fixtures in mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- E. On-site coordination meetings: Provide three on-site coordination meetings between contractor and authorized lighting manufacturer's representative to review the following:
 - 1. Pre-construction meeting, prior to rough in stage to review control wiring diagrams, control component placement, occupancy sensor location/placement, wiring types and interconnections, locations of racks/panels, and general overview of control system.
 - 2. Mock up review, after completion of mock-up areas to review operation of each area type for correct operation. At this meeting, the general settings, adjustments, and programming shall be documented and implemented.
 - 3. Final operational test shall take place at substantial completion to verify proper operation of entire building and site lighting control systems. Final settings and programming adjustments shall be made to the satisfaction of the engineer and architect and fully documented for future reference by the owner as required, and included/provided in the final closeout documentation.

1.9 COORDINATION

A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide product indicated on Drawings.

2.2 GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. Sheet Metal Components:
 - 1. Formed from 22 gauge steel unless otherwise indicated.
 - 2. Form and support to prevent warping and sagging.
 - 3. Free of burrs and sharp corners and edges.
 - 4. Cleaned and powder-coated after fabrication
- C. LED fixtures: Comply with UL 1598. L80 Performance for 50,000 hours. Color temperature consistency shall be indistinguishable and the color shift over a five year period shall be less than 0.007 on the CIE 1976 (u',v') diagram, or a 7-step MacAdam ellipse.
- D. Metal Parts: Free of burrs and sharp corners and edges.
- E. Doors, Frames, and Other Internal Access:
 - 1. Spring loaded cam type latches.
 - 2. Gasketed lens frame fixture to be free of light leakage under operating conditions.
 - 3. Designed to permit re-lamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during re-lamping and when secured in operating position.
- F. Diffusers and Globes:
 - 1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - a. Lens Thickness: 0.125 inch <u>MINIMUM</u> unless otherwise indicated.
 - b. UV stabilized.
 - 2. Glass: Annealed crystal glass unless otherwise indicated.
- G. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
 - 1. Label shall include the following lamp and ballast characteristics:
 - a. "USE ONLY" and include specific lamp type.
 - b. CCT and CRI for all luminaires.

2.3 LED DRIVERS

- A. Ambient temperature ratings shall be -40 deg F minimum, 130 deg F maximum
- B. Power factor: 0.94 or higher
- C. Total Harmonic distortion: <20%
- D. Minimum warranty on drivers 5 years
- E. NRTL certified (UL/CSA/FM)

2.4 EXIT SIGNS

- A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.
- B. Internally Lighted Signs:
 - 1. Lamps for AC Operation: Fluorescent, two for each fixture, 20,000 hours of rated lamp life.
 - 2. Lamps for AC Operation: LEDs, 50,000 hours minimum rated lamp life.
 - 3. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
 - a. Battery: Sealed, maintenance-free, nickel-cadmium type.
 - b. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - c. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
 - d. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - e. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 - f. Remote Test: Switch in hand-held remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal power supply, providing visual confirmation of either proper or failed emergency response.
 - g. Integral Self-Test: Factory-installed electronic device automatically initiates coderequired test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

2.5 EMERGENCY LIGHTING UNITS

- A. General Requirements for Emergency Lighting Units: Self-contained units complying with UL 924.
 - 1. Battery: Sealed, maintenance-free, lead-acid type.
 - 2. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - 3. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
 - 4. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - 5. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 - 6. Wire Guard: Heavy-chrome-plated wire guard protects lamp heads or fixtures.
 - 7. Integral Time-Delay Relay: Holds unit on for fixed interval of 15 minutes when power is restored after an outage.

8. Integral Self-Test: Factory-installed electronic device automatically initiates coderequired test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

2.6 LIGHTING FIXTURE SUPPORT COMPONENTS

- A. Comply with Section 26 05 29 "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and non-metallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.
- C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.
- D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.
- E. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 12 gauge.
- F. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- G. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Lighting fixtures:
 - 1. Set level, plumb, and square with ceilings and walls unless otherwise indicated.
 - 2. Install lamps in each luminaire.
- B. Temporary Lighting: If it is necessary, and approved by Architect, to use permanent luminaires for temporary lighting, install and energize the minimum number of luminaires necessary. When construction is sufficiently complete, remove the temporary luminaires, disassemble, clean thoroughly, install new lamps, and reinstall.
- C. Remote Mounting of Ballasts: Distance between the ballast and fixture shall not exceed that recommended by ballast manufacturer. Verify, with ballast manufacturers, maximum distance between ballast and luminaire.
- D. Lay-in Ceiling Lighting Fixtures Supports:
 - 1. Install ceiling support system wires, independent of the ceiling suspension devices and grid, to all four 4 corners of each fixture.
 - 2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
 - 3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.
- E. Suspended Lighting Fixture Support:
 - 1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
 - 2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
 - 3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.

- 4. Do not use grid as support for pendant luminaires. Connect support wires or rods to building structure.
- F. Air-Handling Lighting Fixtures: Install with dampers closed and ready for adjustment.
- G. Connect wiring according to Section 26 05 19 "Low Voltage Electrical Power Conductors and Cables."

3.2 IDENTIFICATION

A. Install labels with panel and circuit numbers on concealed junction and outlet boxes. Comply with requirements for identification specified in Section 26 05 53 "Electrical Identification."

3.3 FIELD QUALITY CONTROL

- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.
- B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.4 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting aimable luminaires to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose. Some of this work may be required after dark.
 - 1. Adjust aimable luminaires in the presence of Architect.

END OF SECTION