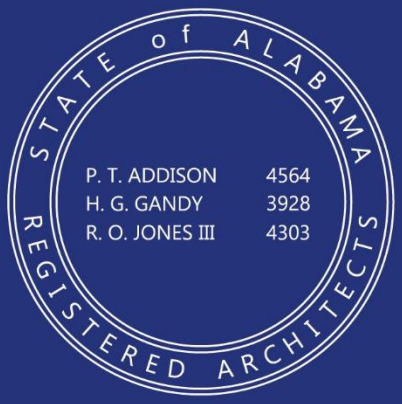


A PROJECT MANUAL FOR

A NEW FLEET MANAGEMENT BUILDING FOR AIDT MONTGOMERY, ALABAMA

AUGUST 20, 2026 R.T.A.

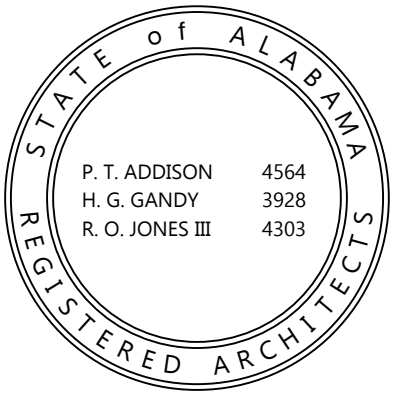
REBID

PH&J No.: 2502CUA

DCM No.: 2025417

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These Specifications were prepared by and under the direct supervision of P.H. & J. Architects, Inc., Montgomery, Alabama



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SECTION 0005

ADVERTISEMENT FOR BIDS

Sealed proposals will be received from qualified General Contractors at the offices of the Alabama Industrial Development Training, Joe Self Auditoriom, 15 Technology Court, Montgomery, Alabama 36116 until **2:00 PM** (local prevailing time), **October 22, 2026**; and thereafter opened publicly for construction of:

A NEW FLEET MANAGEMENT BUILDING FOR AIDT MONTGOMERY, ALABAMA

The work includes construction of approximately 3,100 sf of new building space and related site work, with all trades incorporated in the General Contract.

Obtaining Bid Documents: Electronic images of bid documents may be viewed on-line at no cost through Alabama Graphics web site (www.algraphicsplanroom.com) and hard copies at the office of the Architect. Questions pertaining to accessing the web site should be directed to Bryant Haynie 334/263-0529. Access jobs under “PUBLIC JOBS” for the above-named project. Bidders may obtain Bid Documents as directed below. Bid Documents may only be obtained from:

Alabama Graphics
350 E. Fred D. Gray Ave
Montgomery, Alabama 36104

Bid Documents: Bid Documents either paper copies OR full sets of electronic copies (pdf format) may be purchased through the Alabama Graphics DPR web site upon payment to Alabama Graphics. The cost will be **$250.00** per set. This is the full cost of printing, handling, and distribution.

Official interpretations will be based on complete, full-size sets. Bid documents may be used only for the purpose of bidding and constructing this project. Documents may not be copied in whole or in part by electronic or other means. Anyone placing an order for plans and specifications will be notified of all addenda by e-mail. The architect retains all copyrights and ownership of the documents.

The award will be made only to competent and responsible bidders as mandated by Title 39 of the Code of Alabama respondents who have the experience and other qualifications as set forth in the bid documents. Pre-bid qualification is not required. All bidders must be licensed under Title 34 of the Code of Alabama and evidence thereof must appear on the proposal envelope (outside in clear view) or it will not be opened.

A **NON-MANDATORY** Pre-bid conference will be held at **10:00 AM**, local prevailing time on **October 13, 2026**, at the Building Site for the purpose of reviewing the project and answering Bidder’s questions. Attendance at this Pre-Bid Conference is highly recommended for General Contractors and Sub-Contractors.

This project qualifies for the Sales Tax Saving Program and the Owner intends to implement this program.

Bidders must comply with Alabama House Bill 289 (Act 2009-657) in reference to Fire Alarm Systems.

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Pursuant to State Law a cashier's check or bid bond payable to the Owner in an amount not less than five (5) percent of the amount of the bid, but in no event more than $10,000.00, must be enclosed with the bid to secure the bid for at least **30 days**. Conditional bids will be rejected. A list of major subcontractors must be submitted as indicated in the Supplemental Instructions to Bidders. Performance and Payment Bonds and evidence of specified insurance are pre-requisites of contract award. Right is reserved by the Awarding Authority to reject all bids and to waive irregularities.

The Owner reserves the right to reject any or all proposals and to waive technical errors if, in the Owner's judgment, the best interests of the Owner will thereby be promoted.

ALABAMA INDUSTRIAL DEVELOPMENT TRAINING
EXECUTIVE DIRECTOR
ED CASTILE

By: PH&J ARCHITECTS, INC.
807 S. McDonough St. (36104)
P.O. Box 215 (36101)
Montgomery, Alabama
Telephone (334) 265-8781

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INSTRUCTIONS TO BIDDERS

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1. BID DOCUMENTS:

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

2. GENERAL CONTRACTOR'S STATE LICENSING REQUIREMENTS:

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

3. QUALIFICATIONS of BIDDERS and PREQUALIFICATION PROCEDURES:

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

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

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

4. PREFERENCE to RESIDENT CONTRACTORS:
(If this project is federally funded in whole or in part, this Article shall not apply.)

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

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

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

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

6. EXPLANATIONS and INTERPRETATIONS:

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

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

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

7. SUBSTITUTIONS:

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

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

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

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

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

8. PREPARATION and DELIVERY of BIDS:

a. DCM Form C-3: Proposal Form:

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

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

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

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

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

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

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

(7) The Proposal Form shall be properly signed by the bidder. If the bidder is:

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

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

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

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

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

c. Bid Guaranty

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

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

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

d. Delivery of Bids:

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

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

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

9. WITHDRAWAL or REVISION of BIDS:

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

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

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

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

10. OPENING of BIDS:

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

b. A list of all proposed major subcontractors and suppliers will be submitted by Bidders to the Architect at a time subsequent to the receipt of bids as established by the Architect in the Bid Documents but in no event shall this time exceed twenty-four (24) hours after receipt of bids. If the list includes a fire alarm contractor and/or fire sprinkler contractor, Bidders will also submit a copy of the fire alarm contractor's and/or fire sprinkler contractor's permits from the State of Alabama Fire Marshal's Office.

11. INCOMPLETE and IRREGULAR BIDS:

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

12. BID ERRORS:

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

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

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

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

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

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

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

13. DISQUALIFICATION of BIDDERS:

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

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

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

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

14. CONSIDERATION of BIDS:

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

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

15. DETERMINATION of LOW BIDDER by USE of ALTERNATES:

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

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

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

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

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

16. UNIT PRICES:

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

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

17. AWARD of CONTRACT:

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

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

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

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

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

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

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

END of INSTRUCTIONS TO BIDDERS

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SECTION 0011

SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

(Additions and Modifications to Standard DCM Form C-2 dated February 2024)

1. **General**: These supplemental instructions supplement, modify and take precedence over "DCM Form C-2 Instructions to Bidders."

2. **Documents**: Drawings and Project Manual may be obtained as noted in the Invitation For Bids. Sets may be examined at the Office of the Owner and the Architect.

   Partial sets will be issued as stated in the "Advertisement For Bids" upon written request specifying drawing sheet(s) and /or specifications division(s) requested. Bidders, sub-contractors and vendors should only make such request after viewing and examining the compete set. Official interpretations will be based on complete, full-size sets. Architects retains copyright to all documents. Documents may not be copied in whole or in part by electronic or other means.

3. **Bidders Representation**: Each Bidder by making his bid represents that he has read and understands the documents, and that he has visited the site and familiarized himself with all local conditions affecting the Work.

   Arrangements to inspect the existing site must be made through Keith Tomberlin, AIDT Property Manager, phone 334-652-2046.

4. **Alternates**: Bidders are requested to bid on all Alternates or unit costs indicated. State alternate bids as additions or deductions to the Base Bid. Where an Alternate does not involve a change in price, insert the words "No Change". Bidders not desiring to bid a certain Alternate should so indicate by the words "No Bid". Bidders failing to bid an Alternate risk disqualification of their bid.

5. **Preparation of (and Adjustments to) Bid**: Enclose bid in a sealed envelope bearing the name of the work and of the bidder and the bidder's State License Number for General Contracting. Prepare bid on form bound in Project Manual or copy thereof with attached Accounting of Sales Tax Form bound herein. Only one copy is required.

   After the bid has been sealed, adjustments may only be made to the bid by an individual authorized to do so by the person who signed the proposal form. Such corrections shall be made on the face of the sealed envelope,and must not reveal the amount of the original bid.

   The Bid Bond and Power of Attorney must be dated the same date. The date must be the date of the bid opening or a date prior to the bid opening. The Bid Bond must be in effect and valid at the time of the bid opening.

   The Proposal Form must be dated the same date as bid opening, or a date prior to bid opening.

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Proposals and any adjustments to bid will be received at the bid location stated in the advertisement only.

Sales and Use Tax exempted by Legislative Act 2013-205 is not to be included in the price on the "Proposal Form, DCM Form C-3."

Sales and Use Tax exempted by Legislative Act 2013-205 is to be indicated on the attached form "Accounting of Sales Tax, Attachment to DCM Form C-3, Proposal Form, DCM C-3A Sales Tax".

6. **Questions**: Informal questions regarding the work should be directed to Harry Williams, of PH&J Architects, 334-265-8781 or via email hwilliams@phjarch.com.

7. **Modification and Withdrawal**: See Article 9 of Printed Instructions. After the bid opening, bids may be withdrawn or modified only after the expiration of 30 days.

8. **List of Subcontractors**: In accordance with regulations of the Alabama Division of Construction Management each bid shall incorporate a list of suppliers and subcontractors proposed for the principal parts of the work. Bids submitted without a complete list may be rejected. Subcontractors listed and thereafter approved may not be changed without approval of the Owner and Division of Construction Management Director. The list of subs will not constitute a qualification of the bid, and acceptance of a bid with such list will not constitute a waiver of any pre-approval requirement or other requirement of qualification or experience as applies to subcontractors. After its approval, the list will be made an attachment to the Owner/Contractor Agreement.

   Bidders at their option may delay the submission of such list up to 24 hours. Lists so delayed shall be submitted direct to the Architect (via email (phj@phjarch.com) if necessary). After the 24 hours has expired, bids without such a list may be rejected. The time of receipt and completeness of the list will be incorporated in the Certified Bid Tabulation which is required by law to be submitted to the awarding authority.

   Include with the subcontractors list the following to provide evidence of licensure of the Fire Alarm Contractor/Subcontractor as required by HB289 (Act 2009-657). This bid may not be considered without the following information:

   Company name and state of residence.
   State of Alabama contractor's license number.
   Copy of State Fire Marshal's Permit

   Immediately after the bid opening, bidders will be advised which alternates, if any, should be considered in completion of the list. If the actual accepted alternates change, the successful bidder will be given an opportunity to justify modification of his list.

9. **Pre-bid Approval of Materials** (Modifications to Article 7 of Printed Instructions): Refer to Section 0160.

10. **Sales and Use Tax**: This project qualifies for sales and use tax exemption as indicated in the Supplementary Conditions.

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11. **Disclosure Statement**: Complete Disclosure Statement (Bound in Project Manual) as required by State Law. Successful bidder must return to the owner with the executed contract.

12. **Award**: Because the Owner will not know the amount of funding available for this project until after bids are received, Par 15 of the DCM printed form, Instructions to Bidders, is modified to indicate that there will be no public announcement of funds available immediately prior to the bid opening.

13. **Bidder Qualifications**: Pursuant to its obligation under Title 39 of the Code of Alabama, the Awarding Authority has restricted award of this project to licensed General Contractors of good reputation; who have been established in the commercial/institutional field of construction for at least 5 continuous years, are stable in ownership and locality, and who have successfully completed at least 3 projects similar to the size and type of the proposed construction. This experience must be reasonably current and personnel with the experience must be available.

    Release of bidding documents by the Architect to a prospective bidder will not constitute any determination by the Owner or Architect that said bidder has been found to be “qualified” or “responsible” under applicable state law.

14. **Pre-qualification of Subcontractors and Suppliers**: Certain subs and suppliers, as noted in individual specification sections, require pre-bid approval. Request for approval should be made as early as possible but not later than 10 days prior to the bid date. Requests should be addressed to the Architect, and include an expression of interest in the work, brief history of the firm, and successful experience with work of equivalent size and character, along with references and telephone numbers of architects, owners and contractors who can attest to the experience, superior workmanship, responsibility and stability of the applicant.

    Pre-approval of, or release of bidding documents by the Architect to, a prospective sub-contract bidder or supplier will not constitute any guarantee by the Owner or Architect that said bidder has been found to be bondable, licensed, “qualified” or “responsible” under applicable state law or under these contract requirements.

15. **Pre-Bid Conference**: A pre-bid conference will be held at the place indicated in the Advertisement for Bid, at which time conditions affectingf the work will be discussed. Any contractual determinations made at this conference will be verified by Addendum; only explanations so verified will be considered part of the contract terms or conditions.

End of Section

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Section 0020

EXTRACT OF GC LICENSE LAW

ALABAMA LAW

Chapter 8 of Title 34 of the Code of Alabama, 1975
(Current as of August, 2006)

CHAPTER 8
CONTRACTORS

§ Section 34-8-1 (Effective Jan. 1, 1998) "General contractor" defined; "Subcontractor" defined.

(a) For the purpose of this chapter, a "general contractor" is defined to be one who, for a fixed price, commission, fee, or wage undertakes to construct or superintend or engage in the construction, alteration, maintenance, repair, rehabilitation, remediation, reclamation, or demolition of any building, highway, sewer, structure, site work, grading, paving or project or any improvement in the State of Alabama where the cost of the undertaking is fifty thousand dollars ($50,000) or more, shall be deemed and held to have engaged in the business of general contracting in the State of Alabama.

(b) For the purpose of this chapter, a "general contractor" is defined to include one who, for a fixed price, commission, fee, or wage exceeding five thousand dollars ($5,000), undertakes to construct, superintend the construction of, repair, or renovate, any swimming pool, and anyone who shall engage in the construction, superintending of the construction, repair, or renovation of any swimming pool in the State of Alabama, where the cost of the undertaking exceeds five thousand dollars ($5,000), shall be deemed and held to have engaged in the business of general contracting in the State of Alabama and shall be subject to this chapter.

(c) For the purpose of this chapter a "subcontractor" is defined to be one who performs work under contract to a general contractor as defined in subsection (a).

(Acts 1935, No. 297, p. 721; Code 1940, T. 46, §65; Acts 1959, No. 571, p. 1429; Acts 1989, No. 89-648, p. 1278, §1; Acts 1996, No. 96-640, p. 1013, §1; Acts 1997, No. 97-270, §1; Act 2003-142, §3.)

§ Section 34-8-2 Licensure and classification of contractors.

(a) Any person desiring to be licensed or desiring a renewal of an existing license as a general contractor in this state shall make and file with the board, not less than 30 days prior to any regular meeting thereof, a written application on a form as prescribed for examination by the board and the application shall be accompanied by three hundred dollars ($300) for a new application or two hundred dollars ($200) in case of a renewal. If a licensee fails to renew his or her license within 90 days following expiration of the previous license, a late penalty of fifty dollars ($50) shall be collected, upon renewal, in addition to the renewal fee. The applicant shall apply for a license covering the type or types of contracts on which he or she wishes to perform, and the board shall classify contractors according to the type or types of contracts on which they may perform, within maximum bid limits, on the following basis: the applicant's request, his or her last annual financial statement prepared by a certified public accountant (CPA) or by any independent licensed public accountant approved by the Licensing Board for General Contractors, his or her previous experience, equipment, and the facts in each case. An applicant shall not be so classified as to permit him or her to bid on or to perform a type of work not included in his or her request for a license. If the application is satisfactory to the board, then the applicant may be required to take an examination to determine his or her qualifications. If the result of the examination of the applicant is satisfactory to the board, the board shall then issue to the applicant a certificate to engage in general contracting in the State of Alabama, stipulating in each license issued the type or types of work the contractor is permitted to bid on or to perform under his or her license and also setting out a letter symbol indicating the maximum limits on which he or she is permitted to bid or to perform in a single contract. The maximum bid limits shall be set by the formula of not more than 10 times either the net worth or working capital, whichever is the lesser amount, as shown by the applicant's latest financial statement and designated in the classification set out herein that is the closest to this amount. Should the financial statement of the applicant fail to substantiate the limits requested, further consideration may be given to (1) the present market value in lieu of book value of listed assets when properly supported with substantiating evidence, and (2) a combined statement of the applicant that includes other wholly owned or substantially owned interests. When an applicant's statement qualifies for an amount in excess of classification "E", the limits shall then be set as classification Unlimited or "U". The following letter symbols indicate the maximum amount bid limits allowed a licensee on any one single contract undertaking:

A - Not to exceed	$ 100,000.00
B - Not to exceed	$ 250,000.00
C - Not to exceed	$ 500,000.00
D - Not to exceed	$1,000,000.00
E - Not to exceed	$3,000,000.00
U - Unlimited	

(b) Any person failing to pass the examination may be reexamined at any regular or called meeting of the board. The certificate of authority to engage in the business of general contracting in the State of Alabama shall expire 12 months following its issuance or renewal and shall become invalid on that date unless renewed. The board may provide for a transitional period following May 19, 1999, during which licenses may be renewed for less than 12 months, or more than 12 months, in order to implement a staggered license renewal schedule in which licenses would be renewed each month throughout the year. Once the transitional period is completed, each license shall be renewed for a 12-month period. The board may promulgate rules and regulations relating to the procedures for renewal of licenses. Upon the renewal of a license, the board shall reclassify or confirm the license both as to the types of work and bid limits as specified in this section. A licensee may apply for and, on proof satisfactory to the board, may receive an increase in the amount of his or her bid limit or a change in his or her classification. Application for renewal of a license, together with the payment of a fee of two hundred dollars ($200), received by the board at least 30 days prior to expiration, shall serve to extend the current license until the board either renews the license or denies the application. At the discretion of the board, a limited license may be issued for a particular project.
The sum or fee of three hundred dollars ($300) accompanying original applications and sum or fee of two hundred dollars ($200) accompanying applications for renewals under this section are for the administration and enforcement of this chapter and shall not be refunded to the applicant.

(Acts 1935, No. 297, p. 721; Code 1940, T. 46, §73; Acts 1959, No. 571, p. 1429; Acts 1961, Ex. Sess., No. 150, p. 2093; Acts 1975, No. 485, p. 1115, §1; Acts 1982, No. 82-400, p. 603, §4; Acts 1986, No. 86-557, p. 1133, §3; Acts 1991, No. 91-197, §3; Acts 1996, No. 96-640, p. 1013, §1; Act 99-199, p. 251, §3.)

§ Section 34-8-8 Copy of chapter to be included in plans of owners, architects, and engineers; inclusion of license number on bid.

(a) All owners, architects, and engineers preparing plans and specifications for work to be contracted in Alabama pursuant to this chapter shall include in their invitations to bidders, including but not limited to all public and private advertisements, and their specifications a copy of this chapter or the portions thereof as are deemed necessary to convey to the invited bidder, whether he or she is a resident or nonresident of this state and whether a license has been issued to him or her or not, the information that it will be necessary for him or her to show evidence of license before his or her bid is considered. Any person including an owner, architect, or engineer who violates this section shall be guilty of a Class B misdemeanor and shall for each offense of which he or she is convicted be punished, fined, or both, in accordance with Sections 13A-5-7 and 13A-5-12.

(b) All owners, architects, and engineers receiving bids pursuant to this chapter shall require the person, firm, or corporation to include his or her current license number on the bid. The owner, architect, and engineer shall reject all bids that do not contain the current license number of the general contractor submitting the bid. All persons who violate this subsection shall be guilty of a Class C misdemeanor and shall for each offense for which he or she is convicted be punished, fined, or both, in accordance with Sections 13A-5-7 and 13A-5-12.

(Acts 1935, No. 297, p. 721; Code 1940, T. 46, §79; Acts 1959, No. 571, p. 1429; Acts 1996, No. 96-640, p. 1013, §1.)

End of Extract

PROPOSAL FORM

To: **ALABAMA INDUSTRIAL DEVELOPMENT TRAINING** Date:_____
(Awarding Authority)

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

_____
(Legal Name of Bidder)

Hereby proposed to furnish all labor and materials and perform all work required for the construction of

WORK; A NEW FLEET MANAGEMENT BUILDING FOR AIDT MONTGOMERY, ALABAMA

in accordance with Drawings and Specifications, dated **8/20/26 R.T.A.** prepared by

PH&J Architects, Inc.,_____ Architect.

The Bidder, which is organized and existing under the laws of the State of _____
_____, having its principal office in the City of _____
_____, is:

☐ a Corporation ☐ a Partnership ☐ an Individual ☐ (other) _____.

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

_____

_____

_____

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

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

ALLOWANCES: The Bidder acknowledges ALL Allowances in the Project Manual ☐ .

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

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

For Alternate No. 1 (*Wash Slab*) ☐ add ☐ deduct $_____

For Alternate No. 2 (*Office Wing Fit-out*) ☐ add ☐ deduct $_____

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

BID SECURITY: The undersigned agrees to enter into a Construction Contract and furnish the prescribed Performance and Payment Bonds and evidence of insurance within fifteen (15) calendar days, or such other period stated in the Bid Documents, after the contract forms have been presented for signature,

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provided such presentation is made within **30 CALENDAR DAYS** after the opening of the bids, or such other period stated in the Bid Documents. As security for this condition, the undersigned further agrees that the funds represented by the Bid Bond (or cashier's check) attached hereto may be called and paid into the account of the Awarding Authority as liquidated damages for failure to so comply.

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

☐ Bid Bond, executed by _____ as Surety,

☐ a cashier's check on the _____ Bank of _____,

for the sum of _____ Dollars ($_____)

made payable to the Awarding Authority.

BIDDER'S ALABAMA LICENSE:

State License for General Contracting: _____

License Number Bid Limit Type(s) of Work

CERTIFICATIONS: The undersigned certifies that he or she is authorized to execute contracts on behalf of the Bidder as legally named, that this proposal is submitted in good faith without fraud or collusion with any other bidder, that the information indicated in these documents 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) _____

* Telephone Number _____

* Email Address _____

(Affix Corporate Seal)

* 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 complete Form C-3A: Accounting of Sales Tax must be submitted with Form C-3: Proposal Form. Submission of 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.

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* * * TO PROPOSAL * * *

If UNIT PRICES are required to adjust units of work, the following will apply. The price shall apply for more or less:

UNIT PRICES: (include with all proposals)

Soil Replacement

For removable of unsatisfactory soil and replace with satisfactory structural fill material, per cubic yard (in place compacted). Price shall apply for more or less. Quantity will be calculated by the Geotechnical Engineers by cross sectioning the excavated area.	$_____PCY

Note: (Include in Base Bid price, under- cutting to the level indicated, plus add 50 CY)

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

To: **ALABAMA INDUSTRIAL DEVELOPMENT TRAINING** Date:_____
(Awarding Authority)

NAME OF PROJECT: **A NEW FLEET MANAGEMENT BUILDING FOR AIDT MONTGOMERY, ALABAMA**

SALES TAX ACCOUNTING:

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

ESTIMATED SALES TAX AMOUNT

BASE BID: _____ Dollars ($ _____)

For Alternate No. 1 (*Wash Slab*) ☐ add ☐ deduct $_____
For Alternate No. 2 (*Office Wing Fit-out*) ☐ add ☐ deduct $_____

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

Legal Name of Bidder _____

Mailing Address _____

* **By (Legal Signature)** _____

* Name (type or print) _____

* Title _____

* Telephone Number _____

* Email Address _____

(Affix Corporate Seal)

Note: A complete Form C-3A: Accounting of Sales Tax must be submitted with Form C-3: Proposal Form. Submission of 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.

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PROPOSAL FORM

To: **ALABAMA INDUSTRIAL DEVELOPMENT TRAINING** Date:_____
(Awarding Authority)

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

_____
(Legal Name of Bidder)

Hereby proposed to furnish all labor and materials and perform all work required for the construction of

WORK; A NEW FLEET MANAGEMENT BUILDING FOR AIDT MONTGOMERY, ALABAMA

in accordance with Drawings and Specifications, dated **8/20/26 R.T.A.** prepared by

PH&J Architects, Inc.,_____ Architect.

The Bidder, which is organized and existing under the laws of the State of _____
_____, having its principal office in the City of _____
_____, is:

☐ a Corporation ☐ a Partnership ☐ an Individual ☐ (other) _____.

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

_____

_____

_____

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

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

ALLOWANCES: The Bidder acknowledges ALL Allowances in the Project Manual ☐ .

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

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

For Alternate No. 1 (*Wash Slab*) ☐ add ☐ deduct $_____

For Alternate No. 2 (*Office Wing Fit-out*) ☐ add ☐ deduct $_____

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

BID SECURITY: The undersigned agrees to enter into a Construction Contract and furnish the prescribed Performance and Payment Bonds and evidence of insurance within fifteen (15) calendar days, or such other period stated in the Bid Documents, after the contract forms have been presented for signature,

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provided such presentation is made within **30 CALENDAR DAYS** after the opening of the bids, or such other period stated in the Bid Documents. As security for this condition, the undersigned further agrees that the funds represented by the Bid Bond (or cashier's check) attached hereto may be called and paid into the account of the Awarding Authority as liquidated damages for failure to so comply.

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

☐ Bid Bond, executed by _____ as Surety,

☐ a cashier's check on the _____ Bank of _____,

for the sum of _____ Dollars ($_____)

made payable to the Awarding Authority.

BIDDER'S ALABAMA LICENSE:

State License for General Contracting: _____

License Number Bid Limit Type(s) of Work

CERTIFICATIONS: The undersigned certifies that he or she is authorized to execute contracts on behalf of the Bidder as legally named, that this proposal is submitted in good faith without fraud or collusion with any other bidder, that the information indicated in these documents 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) _____

* Telephone Number _____

* Email Address _____

(Affix Corporate Seal)

* 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 complete Form C-3A: Accounting of Sales Tax must be submitted with Form C-3: Proposal Form. Submission of 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.

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JULIE P. MAGEE
Commissioner

State of Alabama
Department of Revenue
(www.revenue.alabama.gov)
50 North Ripley Street
Montgomery, Alabama 36132

MICHAEL E. MASON
Assistant Commissioner
JOE W. GARRETT, JR.
Deputy Commissioner
CURTIS E. STEWART
Deputy Commissioner

Alabama Department of Revenue
NOTICE

Tax Guidance for Contractors, Subcontractors and Alabama Governmental Entities Regarding Construction-related Contracts

Legislative Act 2013-205 requires the Department of Revenue to issue Form STC-1, *Sales and Use Tax Certificate of Exemption for Government Entity Projects*, to all contractors and subcontractors working on qualifying governmental entity projects once the Form ST: EXC-01 is approved.

Each exempt entity, contractor and subcontractor must make application for qualification of the exemption using Form ST: EXC-01 for each tax-exempt project. The application is available on the department's website at http://revenue.alabama.gov/salestax/ST-EXC-01.pdf. Applications should be submitted directly to the Sales and Use Tax Division Central Office, P.O Box 327710, Montgomery, AL 36132-7710.

The sales and use tax exemption provided for in Act 2013-205 applies to the purchase of building materials, construction materials and supplies, and other tangible personal property that become part of the structure pursuant to a qualifying contract entered into on or after January 1, 2014. Qualifying projects and contracts are those generally entered into with the following governmental entities, unless otherwise noted: the State of Alabama, a county or incorporated municipality of Alabama, an Alabama public school, or an Alabama industrial or economic development board or authority already exempt from sales and use taxes. **Please note that contracts entered into with the federal government and contracts pertaining to highway, road, or bridge construction or repair do not qualify for the exemption provided for in Act 2013-205.** [Reference: Sales and Use Tax Division Administrative Rule 810-6-3-.77 *Exemption for Certain Purchases by Contractors and Subcontractors in Conjunction with Construction Contracts with Certain Governmental Entities.*]

The Alabama Department of Revenue will assign each contractor and sub-contractor a consumers use tax account, if one is currently not in place, at the time the Form STC-1, Sales *and Use Tax Certificate of Exemption for Government Entity Projects*, is issued.

Contractors and sub-contractors for qualifying projects will be required to file monthly consumers use tax returns and report all exempt purchases for ongoing projects, as well as all taxable purchases on one return. These returns are required to be filed through the department's online tax return filing and payment portal, My Alabama Taxes (https://myalabamataxes.alabama.gov).

As another option for these types of contracts, as well as with other contracts entered into with other types of exempt entities, the Form ST:PAA1, *Purchasing Agent Appointment*, may be used. However, please be advised that the use of the Form ST:PAA1 option will require the exempt entity to be invoiced directly and pay for directly from their funds any construction and building material and supply purchases.

For additional information concerning this guidance, taxpayers should contact Sales and Use Tax Division representative Thomas Sims at 334-242-1574 or by email at Thomas.Sims@revenue.alabama.gov.

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

Application For Sales and Use Tax Certificate of Exemption

FOR GOVERNMENT ENTITY PROJECT

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

PROJECT INFORMATION:

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

APPLICANT'S INFORMATION:

RELATION: *(CHOOSE ONE)*

☐ Government Entity ☐ General Contractor ☐ Subcontractor

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

CONTACT PERSON	BUSINESS TELEPHONE NUMBER
	( )

EMAIL ADDRESS

CONTRACT SIGN DATE (PROVIDED BY GENERAL CONTRACTOR)	CONTRACT COMPLETION DATE (PROVIDED BY GENERAL CONTRACTOR)
ESTIMATED START DATE (FOR APPLICANT)	**ESTIMATED COMPLETION DATE (FOR APPLICANT)**
WILL THE APPLICANT HAVE ANY SUBCONTRACTORS ON THIS JOB? ☐ Yes ☐ No If yes, please attach list.	**NAME OF PARTY TO THE CONTRACT**

JOB DESCRIPTION

WILL ANY POLLUTION CONTROL EXEMPTION BE APPLICABLE? ☐ Yes ☐ No	ESTIMATED POLLUTION CONTROL COST
	$

TOTAL PROJECT BID AMOUNT (APPLICANT'S PORTION OF PROJECT)	LABOR COST (APPLICANT'S PORTION OF PROJECT)	MATERIAL COST (APPLICANT'S PORTION OF PROJECT)
$	$	$

REVENUE DEPARTMENT USE ONLY

PENDING DOCUMENTATION / INFORMATION:

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

Contact Dates: _____ Received Date: _____

_____ Forwarded for Denial: _____

PROJECT NAME	PROJECT OWNER'S FEIN (EXEMPT ENTITY)

FORM OF OWNERSHIP:

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

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

OWNERSHIP INFORMATION:

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

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

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

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

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

NAME *(PLEASE PRINT)* _____ SIGNATURE _____

TITLE _____ DATE _____

REVENUE DEPARTMENT USE ONLY

PENDING OTHER:

☐ Government Entity ☐ General Contractor ☐ Not on LOS

Contact Dates: _____ Received Date: _____

_____ Forwarded for Denial: _____

Examiner's Remarks _____

Examiner _____ Date _____

Instructions For Preparation of Form ST: EXC-01
Sales and Use Tax Certificate of Exemption for Government Entity Project

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

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

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

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

General Contractor:
1. Signed Application
2. Copy of Executed/Signed Contract, Letter of Intent, Notice of Award, and/or Notice to Proceed
3. List of Subcontractors
4. Alabama Board of General Contractor's License
5. State/County Business License (usually obtained through county probate office)
6. Any other municipal business licenses associated with the project

Subcontractor:
1. Signed Application
2. Alabama Board of General Contractor's License
3. State/County Business License (usually obtained through county probate office)
4. Any other municipal business licenses associated with the project
5. List of Subcontractors (if any)

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

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

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

Fax: (334) 353-7867

Email: STExemptionUnit@revenue.alabama.gov

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

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

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

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

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

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

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

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

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

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

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

State of Alabama

Disclosure Statement

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

ENTITY COMPLETING FORM

ADDRESS

CITY, STATE, ZIP TELEPHONE NUMBER

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

ADDRESS

CITY, STATE, ZIP TELEPHONE NUMBER

This form is provided with:

☐ Contract ☐ Proposal ☐ Request for Proposal ☐ Invitation to Bid ☐ Grant Proposal

Have you or any of your partners, divisions, or any related business units previously performed work or provided goods to any State Agency/Department in the current or last fiscal year?

☐ Yes ☐ No

If yes, identify below the State Agency/Department that received the goods or services, the type(s) of goods or services previously provided, and the amount received for the provision of such goods or services.

STATE AGENCY/DEPARTMENT	TYPE OF GOODS/SERVICES	AMOUNT RECEIVED

Have you or any of your partners, divisions, or any related business units previously applied and received any grants from any State Agency/Department in the current or last fiscal year?

☐ Yes ☐ No

If yes, identify the State Agency/Department that awarded the grant, the date such grant was awarded, and the amount of the grant.

STATE AGENCY/DEPARTMENT	DATE GRANT AWARDED	AMOUNT OF GRANT

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

NAME OF PUBLIC OFFICIAL/EMPLOYEE	ADDRESS	STATE DEPARTMENT/AGENCY

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

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

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

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

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

NAME OF PAID CONSULTANT/LOBBYIST	ADDRESS

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

Signature Date

Notary's Signature Date Date Notary Expires

Article 3B of Title 41, Code of Alabama 1975 requires the disclosure statement to be completed and filed with all proposals, bids, contracts, or grant proposals to the State of Alabama in excess of $5,000.

Revised: 09/2013

BID BOND

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

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

The **OWNER** (*Entity name and address*)
Name:
Address:

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

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

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

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

(a) executes and delivers a Construction Contract with the required Performance and Payment Bonds (each in the form contained in the Bid Documents and properly completed in accordance with the bid) and delivers evidence of insurance as prescribed in the Bid Documents, or

(b) fails to execute and deliver such Construction Contract with such Bonds and evidence of insurance, but pays the Owner the difference, not to exceed the Penal Sum of this Bond, between the amount of the Principal's Bid and the larger amount for which the Owner may award a Construction Contract for the same Work to another bidder,

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

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

SIGNED AND SEALED this _____ day of _____, _____.

ATTEST:

_____

PRINCIPAL:

_____

By _____

_____
Name and Title

SURETY:

ATTEST:

_____

_____

By_____

_____
Name and Title

This Sheet Intentionally Left Blank

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

DCM (BC) Project No.

CONSTRUCTION CONTRACT

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

(2) This Construction Contract is entered into this day of in the year of

(3) between the **OWNER,**
Entity Name:
Address:
Email & Phone #:

(4) and the **CONTRACTOR,**
Company Name:
Address:
Email & Phone #:

State of AL Accounting & Resource System (STAARS) or AL Buys Vendor No.: _____

(5) for the **WORK** of the Project, identified as:

(6) The **CONTRACT DOCUMENTS** are dated and have been amended by
(7) **ADDENDA**

(8) The **ARCHITECT** is
Firm Name:
Address:
Email & Phone #:

(9) The **CONTRACT SUM** is

Dollars ($) and is the sum of the Contractor's Base Bid for the Work and the following
(10) **BID ALTERNATE PRICES:**

(11) The **CONTRACT TIME** is ( ) calendar days.

THE OWNER AND THE CONTRACTOR AGREE AS FOLLOWS: The Contract Documents, as defined in the General Conditions of the Contract (DCM Form C-8), are incorporated herein by reference. The Contractor shall perform the Work in accordance with the Contract Documents. The Owner will pay and the Contractor will accept as full compensation for such performance of the Work, the Contract Sum subject to additions and deductions (including liquidated damages) as provided in the Contract Documents. The Work shall commence on a date to be specified in a Notice to Proceed issued by the Owner or 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.

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

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

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

License No.:

Classification(s):

Bid Limit:

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

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

(15)

APPROVALS

By _____ Date: _____
Governor (State Agency projects except ABRFA, AIDB & USSRC)

By _____
Secretary of State (Conservation projects only)

By _____
Add'l Agency, Title:

**ALABAMA DEPARTMENT OF FINANCE,
REAL PROPERTY MANAGEMENT (RPM),
DIVISION OF CONSTRUCTION MANAGEMENT (DCM)**

By _____
Finance Director (Finance, sub-Finance & ABRFA projects only)

By _____
RPM Director (Finance, sub-Finance & ABRFA projects only)

By _____
DCM Director (all State Agency projects)

Reviewed By _____
DCM Contract Administrator (all State Agency projects)

CONTRACTING PARTIES

_____
Contractor Company

By _____
Signature

Name & Title _____

_____
Owner Entity

By _____
Signature

Name & Title _____

Additional Owner Entity signature space if needed:

_____
Owner Entity

By _____
Signature

Name & Title _____

The Awarding Authority/Owner certifies that funds are available in the amount required for the Construction Contract.

Review/Signature flow: Architect/Engineer (prepare documents) > Contractor (review and sign) > Architect/Engineer (review) > Owner (review and sign) > RPM/DCM (review and sign) > Finance-Legal > (> Finance, Finance sub-Agencies & Alabama Building Renovation Finance Authority [ABRFA] projects then go to Finance Director [review and sign]) > Governor (review and sign) (> Conservation projects then go to Secretary of State [review and sign]) > DCM (distribute fully executed Contract to all parties along with a Notice to Proceed). Note: Transportation inserts an additional signature sheet.

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

(1) # PERFORMANCE BOND

SURETY'S BOND NUMBER

Do not staple this form; use clips.

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

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

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

(5) The **PENAL SUM** of this Bond (the Contract Sum)

Dollars ($).

(6) **DATE** of the Construction Contract :

(7) The **PROJECT**: (*Same as appears in the Construction Contract*)

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

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

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

3. Whenever the Architect gives the Contractor and the Surety, at their addresses stated above, a written Notice to Cure a condition for which the Contract may be terminated in accordance with the Contract Documents, the Surety may, within the time stated in the notice, cure or provide the Architect with written verification that satisfactory positive action is in process to cure the condition.

4. The Surety's obligation under this Bond becomes effective after the Contractor fails to satisfy a Notice to Cure and the Owner:

(a) gives the Contractor and the Surety, at their addresses stated above, a written Notice of Termination declaring the Contractor to be in default under the Contract and stating that the Contractor's right to complete the Work, or a designated portion of the Work, shall terminate seven days after the Contractor's receipt of the notice; and

(b) gives the Surety a written demand that, upon the effective date of the Notice of Termination, the Surety promptly fulfill its obligation under this Bond.

5. In the presence of the conditions described in Paragraph 4, the Surety shall, at its expense:

(a) On the effective date of the Notice of Termination, take charge of the Work and be responsible for the safety, security, and protection of the Work, including materials and equipment stored on and off the Project site, and

(b) Within twenty-one days after the effective date of the Notice of Termination, proceed, or provide the Owner with written verification that satisfactory positive action is in process to facilitate proceeding promptly, to complete the Work in accordance with the Contract Documents, either with the Surety's resources or through a contract between the Surety and a qualified contractor to whom the Owner has no reasonable objection.

6. As conditions precedent to taking charge of and completing the Work pursuant to Paragraph 5, the Surety shall neither require, nor be entitled to, any agreements or conditions other than those of this Bond and the Contract Documents. In taking charge of and completing the Work, the Surety shall assume all rights and obligations of the Contractor under the Contract Documents; however, the Surety shall also have the right to assert "Surety Claims" to the Owner in accordance with the Contract Documents. The presence or possibility of a Surety Claim shall not be just cause for the Surety to fail or refuse to promptly take charge of and complete the Work or for the Owner to fail or refuse to continue to make payments in accordance with the Contract Documents.

7. By accepting this Bond as a condition of executing the Construction Contract, and by taking the actions described in Paragraph 4, the Owner agrees that:

(a) the Owner shall promptly advise the Surety of the unpaid balance of the Contract Sum and, upon request, shall make available or furnish to the Surety, at the cost of reproduction, any portions of the Project Record, and

(b) as the Surety completes the Work, or has it completed by a qualified contractor, the Owner shall pay the Surety, in accordance with terms of payment of the Contract Documents, the unpaid balance of the Contract Sum, less any amounts that may be or become due the Owner from the Contractor under the Construction Contract or from the Contractor or the Surety under this Bond.

8. In the presence of the conditions described in Paragraph 4, the Surety's obligation includes responsibility for the correction of Defective Work, liquidated damages, and reimbursement of any reasonable expenses incurred by the Owner as a result of the Contractor's default under the Contract, including architectural, engineering, administrative, and legal services.

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

9. Nothing contained in this Bond shall be construed to mean that the Surety shall be liable to the Owner for an amount exceeding the Penal Sum of this Bond, except in the event that the Surety should be in default under the Bond by failing or refusing to take charge of and complete the Work pursuant to Paragraph 5. If the Surety should fail or refuse to take charge of and complete the Work, the Owner shall have the authority to take charge of and complete the Work, or have it completed, and the following costs to the Owner, less the unpaid balance of the Contract Sum, shall be recoverable under this Bond:

(a) the cost of completing the Contractor's responsibilities under the Contract, including correction of Defective Work;

(b) additional architectural, engineering, managerial, and administrative services, and reasonable attorneys' fees incident to completing the Work;

(c) interest on, and the cost of obtaining, funds to supplement the unpaid balance of the Contract Sum as may be necessary to cover the foregoing costs;

(d) the fair market value of any reductions in the scope of the Work necessitated by insufficiency of the unpaid balance of the Contract Sum and available supplemental funds to cover the foregoing costs; and

(f) additional architectural, engineering, managerial, and administrative services, and reasonable attorneys' fees incident to ascertaining and collecting the Owner's losses under the Bond.

10. All claims and disputes arising out of or related to this bond, or its breach, shall be resolved in accordance with Article 24, General Conditions of the Contract.

(8) **SIGNED AND SEALED** this _____ day of _____, _____.

(9 & 10)

SURETY:	**CONTRACTOR as PRINCIPAL:**
_____ Company Name	_____ Company Name
By_____ Signature	By _____ Signature
_____ Name and Title	_____ Name and Title

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

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

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

(1) # PAYMENT BOND

SURETY'S BOND NUMBER

Do not staple this form; use clips.

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

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

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

(5) The **PENAL SUM** of this Bond (the Contract Sum)

Dollars ($).

(6) **DATE** of the Construction Contract:

(7) The **PROJECT**: (*Same as appears in the Construction Contract*)

1. **WE, THE PRINCIPAL (hereinafter "Contractor") AND THE SURETY**, jointly and severally, hereby bind ourselves, our heirs, executors, administrators, successors, and assigns to the Owner in the Penal Sum stated above to promptly pay all persons supplying labor, materials, or supplies for or in the prosecution of the Contract, which is incorporated herein by reference, and any modifications thereof by Contract Change Orders. If the Contractor and its Subcontractors promptly pay all persons supplying labor, materials, or supplies for or in the prosecution of the Contract and Contract Change Orders, then this obligation shall be null and void; otherwise to remain and be in full force and effect.

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

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

3. Any person that has furnished labor, materials, or supplies for or in the prosecution of the Contract and Contract Change Orders for which payment has not been timely made may institute a civil action upon this Bond and have their rights and claims adjudicated in a civil action and judgment entered thereon. Notwithstanding the foregoing, a civil action may not be instituted on this bond until 45 days after written notice to the Surety of the amount claimed to be due and the nature of the claim. The civil action must commence not later than one year from the date of final settlement of the Contract. The giving of notice by registered or certified mail, postage prepaid, addressed to the Surety at any of its places of business or offices shall be deemed sufficient. In the event the Surety or Contractor fails to pay the claim in full within 45 days from the mailing of the notice, then the person or persons may recover from the Contractor and Surety, in addition to the amount of the claim, a reasonable attorney's fee based on the result, together with interest on the claim from the date of the notice.

4. Every person having a right of action on this bond shall, upon written application to the Owner indicating that labor, material, or supplies for the Work have been supplied and that payment has not been made, be promptly furnished a certified copy of this bond and the Construction Contract. The claimant may bring a civil action in the claimant's name on this Bond against the Contractor and the Surety, or either of them, in the county in which the Work is to be or has been performed or in any other county where venue is otherwise allowed by law.

5. This bond is furnished to comply with Code of Alabama, §39-1-1, and all provisions thereof shall be applicable to civil actions upon this bond.

6. All claims and disputes between Owner and either the Contractor or Surety arising out of or related to this bond, or its breach, shall be resolved in accordance with Article 24, General Conditions of the Contract.

(8) **SIGNED AND SEALED** this _____ day of _____, _____.

(9 & 10)

SURETY:	**CONTRACTOR as PRINCIPAL:**
_____ Company Name	_____ Company Name
By_____ Signature	By _____ Signature
_____ Name and Title	_____ Name and Title

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

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

You may use your own form provided all information requested below, including the "I certify..." statement, and signatures, are on your form. Do not use colored print or shaded cells.

DCM Form B-6
Revised August 2021

SAMPLE CERTIFIED TABULATION OF BIDS

Project:

DCM Project No.: _____

PSCA Project No. (if applicable): _____

Amount of Available Funds: _____

As tabulated below, bids were received:

Date: _____ Time: _____

Place: _____

Contractor:				
Surety:				
All Addenda Acknowledged:				
Base Bid on Proposal:				
Base Bid Envelope Adjustment:				
Total Base Bid:	$ -	$ -	$ -	$ -
Bid Alternate #1 on Proposal:				
Bid Alt. #1 Envelope Adjustment:				
Total Alternate #1:	$ -	$ -	$ -	$ -
Bid Alternate #2 on Proposal:				
Bid Alt. #2 Envelope Adjustment:				
Total Alternate #2:	$ -	$ -	$ -	$ -
Remarks:				

I certify that the above bids were advertised, were received sealed, were publicly opened, and read aloud at the time and place indicated and that this is a true and correct tabulation of all bids received for this project.

_____
Architectural / Engineering Firm Name

By: _____
Signature

_____
Print Name and Title of Architect / Engineer

Sworn to and subscribed before me this _____day of _____ (Month, Year).

_____
Notary Public Signature My Commission Expires

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Alabama Department of Finance
Real Property Management
Division of Construction Management
770 Washington Avenue, Suite 444
Montgomery, Alabama 36104
(334) 242-4082 (phone)

DCM Form B-12
Revised July 2022

CHANGE ORDER CHECKLIST

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

WHICH FORM DO YOU USE?

Use **DCM Form C-12** for contracts of state agencies and departments and State Department of Education (SDE) projects. Also use for ACCS projects with Notice-to-Proceeds issued prior to August 1, 2021.
Use **DCM Form 9-J** for contracts of projects partially or fully Public School and College Authority (PSCA)-funded, except for ACCS projects with Notice-To-Proceeds issued after July 31, 2021. Include a completed **DCM Form B-11:** Change Order Justification with each copy of either DCM Forms C-12 or 9-J.

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

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

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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) s**ubstitutions and deviations not properly submitted and approved or otherwise authorized, **(4)** temporary

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

K. DIRECTOR: The Director of the Alabama Division of Construction Management.

L. DRAWINGS: The Drawings are the portions of the Contract Documents showing graphically the design, location, layout, and dimensions of the Work, in the form of plans, elevations, sections, details, schedules, and diagrams.

M. NOTICE TO PROCEED: A proceed order issued by the Owner or Director, as applicable, fixing the date on which the Contractor shall begin the prosecution of the Work, which is also the date on which the Contract Time shall begin.

N.1 OWNER: The Owner is the entity or entities identified as such in the Construction Contract and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's authorized representative. The term "Owner" as used herein shall be synonymous with the term "Awarding Authority".

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

O. THE PROJECT: The Project is the total construction of which the Work required by these Contract Documents may be the entirety or only a part with other portions to be constructed by the Owner or separate contractors.

P. PROJECT MANUAL: The Project Manual is the volume usually assembled for the Work which may include the Advertisement for Bids, Instructions to Bidders, sample forms, General Conditions of the Contract, Supplementary Conditions, and Specifications of the Work.

Q. SPECIFICATIONS: The Specifications are that portion of the Contract Documents which set forth in writing the standards of quality and performance of products, equipment, materials, systems, and services and workmanship required for acceptable performance of the Work.

R. SUBCONTRACTOR: A Subcontractor is a person or entity who is undertaking the performance of any part of the Work by virtue of a contract with the Contractor. The term "Subcontractor" means a Subcontractor or its authorized representatives.

S. THE WORK: The Work is the construction and services required by the Contract Documents and includes all labor, materials, supplies, equipment, and other items and services as are necessary to produce the required construction and to fulfill the Contractor's obligations under the Contract. The Work may constitute the entire Project or only a portion of it.

ARTICLE 2
INTENT and INTERPRETATION of the CONTRACT DOCUMENTS

A. INTENT

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

B. COMPLEMENTARY DOCUMENTS

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

C. ORDER of PRECEDENCE

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

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

D. ORGANIZATION

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

E. INTERPRETATION

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

for brevity of the Contract Documents, the inadvertent omission of words or phrases, or obvious typographical or written errors shall not defeat such interpretation as long as it is reasonably inferable from the Contract Documents as a whole.

(2) Words or phrases used in the Contract Documents which have well-known technical or construction industry meanings are to be interpreted consistent with such recognized meanings unless otherwise indicated.

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

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

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

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

F. SEVERABILITY.

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

ARTICLE 3
CONTRACTOR'S REPRESENTATIONS

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

A. The Contractor has visited the site of the Work to become familiar with local conditions under which the Work is to be performed and to evaluate reasonably observable conditions as compared with requirements of the Contract Documents.

B. The Contractor shall use its best skill and attention to perform the Work in an expeditious manner consistent with the Contract Documents.

C. The Contractor is an independent contractor and in performance of the Contract remains and shall act as an independent contractor having no authority to represent or obligate the Owner in any manner unless authorized by the Owner in writing.

ARTICLE 4
DOCUMENTS FURNISHED to CONTRACTOR

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

ARTICLE 5
OWNERSHIP of DRAWINGS

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

ARTICLE 6
SUPERVISION, SUPERINTENDENT, and EMPLOYEES

A. SUPERVISION and CONSTRUCTION METHODS

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

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

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

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

B. SUPERINTENDENT

(1) The Contractor shall employ and maintain a competent level of supervision for the performance of the Work at the Project site, including a superintendent who shall:
(a) have full authority to receive instructions from the Architect or Owner and to act on those instructions and **(b)** be present at the Project site at all times during which Work is being performed.

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

C. EMPLOYEES

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

ARTICLE 7
REVIEW of CONTRACT DOCUMENTS and FIELD CONDITIONS by CONTRACTOR

A. In order to facilitate assembly and installation of the Work in accordance with the Contract Documents, before starting each portion of the Work, the Contractor shall examine and compare the relevant Contract Documents, and compare them to relevant field measurements made by the Contractor and any conditions at the site affecting that portion of the Work.

B. If the Contractor discovers any errors, omissions, or inconsistencies in the Contract Documents, the Contractor shall promptly report them to the Architect as a written request for information that includes a detailed statement identifying the specific Drawings or Specifications that are in need of clarification and the error, omission, or inconsistency discovered in them.

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

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

C. If the Contractor considers the Architect's response to a request for information to constitute a change to the Contract Documents involving additional costs and/or time, the Contractor shall follow the procedures of Article 20, Claims for Extra Cost or Extra Work.

D. If, with undue frequency, the Contractor requests information that is obtainable through reasonable examination and comparison of the Contract Documents, site conditions, and previous correspondence, interpretations, or clarifications, the Contractor shall be liable to the Owner for reasonable charges from the Architect for the additional services required to review, research, and respond to such requests for information.

ARTICLE 8
SURVEYS by CONTRACTOR

A. The Contractor shall provide competent engineering services to assure accurate execution of the Work in accordance with the Contract Documents. The Contractor shall verify the figures given for the contours, approaches and locations shown on the Drawings before starting any Work and be responsible for the accuracy of the finished Work. Without extra cost to the Owner, the Contractor shall engage a licensed surveyor if necessary to verify boundary lines, keep within property lines, and shall be responsible for encroachments on rights or property of public or surrounding property owners.

B. The Contractor shall establish all base lines for the location of the principal components of the Work and make all detail surveys necessary for construction, including grade stakes, batter boards and other working points, lines and elevations. If the Work involves alteration of or addition to existing structures or improvements, the Contractor shall locate and measure elements of the existing conditions as is necessary to facilitate accurate fabrication, assembly, and installation of new Work in the relationship, alignment, and/or connection to the existing structure or improvement as is shown in the Contract Documents.

ARTICLE 9
SUBMITTALS

A. Where required by the Contract Documents, the Contractor shall submit shop drawings, product data, samples and other information (hereinafter referred to as Submittals) to the Architect for the purpose of demonstrating the way by which the Contractor proposes to conform to the requirements of the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect without action.

B. The Contractor shall be responsible to the Owner for the accuracy of its Submittals and the conformity of its submitted information to the requirements of the Contract Documents. Each Submittal shall bear the Contractor's approval, evidencing that the Contractor has reviewed and found the information to be in compliance with the requirements of the Contract Documents. Submittals which are not marked as reviewed and approved by the Contractor may be returned by the Architect without action.

C. The Contractor shall prepare and deliver its submittals to the Architect sufficiently in advance of construction requirements and in a sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. In coordinating the Submittal process with its construction schedule, the Contractor shall allow sufficient time to permit adequate review by the Architect.

D. By approving a Submittal the Contractor represents not only that the element of Work presented in the Submittal complies with the requirements of the Contract Documents, but also that the Contractor has:

(1) found the layout and/or dimensions in the Submittal to be comparable with those in the Contract Documents and other relevant Submittals and has made field measurements as necessary to verify their accuracy, and
(2) determined that products, materials, systems, equipment and/or procedures presented in the Submittal are compatible with those presented, or being presented, in other relevant Submittals and

with the Contractor's intended Construction Methods.

E. The Contractor shall not fabricate or perform any portion of the Work for which the Contract Documents require Submittals until the respective Submittals have been approved by the Architect.

F. In the case of a resubmission, the Contractor shall direct specific attention to all revisions in a Submittal. The Architect's approval of a resubmission shall not apply to any revisions that were not brought to the Architect's attention.

G. If the Contract Documents specify that a Submittal is to be prepared and sealed by a registered architect or licensed engineer retained by the Contractor, all drawings, calculations, specifications, and certifications of the Submittal shall bear the Alabama seal of registration and signature of the registered/licensed design professional who prepared them or under whose supervision they were prepared. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of such a Submittal, provided that all performance and design criteria that such Submittal must satisfy are sufficiently specified in the Contract Documents. The Architect will review, approve or take other appropriate action on such a Submittal only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance or design criteria specified in the Contract Documents.

H. DEVIATIONS

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

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

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

I. ARCHITECT'S REVIEW and APPROVAL

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

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

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

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

J. CONFORMANCE with SUBMITTALS

The Work shall be constructed in accordance with approved Submittals.

ARTICLE 10
DOCUMENTS and SAMPLES at the SITE

A. "AS ISSUED" SET

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

B. "POSTED" SET

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

C. RECORD SET

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

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

ARTICLE 11
"AS-BUILT" DOCUMENTS

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

B. The Contractor shall use the following methods for incorporating information into the "As-built" documents:

(1) Drawings

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

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

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

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

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

(2) Project Manual

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

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

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

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

ARTICLE 12
PROGRESS SCHEDULE

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

A. The Contractor shall within fifteen days after the date of commencement stated in the Notice to Proceed, or such other time as may be provided in the Contract Documents, prepare and submit to the Architect for review and approval a practicable construction schedule informing the Architect and Owner of the order in which the Contractor plans to carry on the Work within the Contract Time. The Architect's review and approval of the Contractor's construction schedule shall be only for compliance with the specified format, Contract Time, and suitability for monitoring progress of the Work and shall not be construed as a representation that the Architect has analyzed the schedule to form opinions of sequences or durations of time represented in the schedule.

B. If a schedule format is not specified elsewhere in the Contract Documents, the construction schedule shall be prepared using DCM Form C-11, "Sample Progress Schedule and Report", (contained in the Project Manual) or similar format of suitable scale and detail to indicate the percentage of Work scheduled to be completed at the end of each month. At the end of each month the Contractor shall enter the actual percentage of completion on the construction schedule submit two copies to the Architect, and attach one copy to each copy of the monthly Application for Payment. The construction schedule shall be revised to reflect any agreed extensions of the Contract Time or as required by conditions of the Work.

C. If a more comprehensive schedule format is specified elsewhere in the Contract Documents or voluntarily employed by the Contractor, it may be used in lieu of DCM Form C-11.

D. The Contractor's construction schedule shall be used by the Contractor, Architect, and Owner to determine the adequacy of the Contractor's progress. The Contractor shall be responsible for maintaining progress in accordance with the currently approved construction schedule and shall increase the number of shifts, and/or overtime operations, days of work, and/or the amount of construction plant and equipment as may be necessary to do so. If the Contractor's progress falls materially behind the currently approved construction schedule and, in the opinion of the Architect or Owner, the Contractor is not taking sufficient steps to regain schedule, the Architect may, with the Owner's concurrence, issue the Contractor a Notice to Cure pursuant to Article 27. In such a Notice to Cure the Architect may require the Contractor to submit such supplementary or revised construction schedules as may be deemed necessary to demonstrate the manner in which schedule will be regained.

ARTICLE 13
EQUIPMENT, MATERIALS, and SUBSTITUTIONS

A. Every part of the Work shall be executed in a workmanlike manner in accordance with the Contract Documents and approved Submittals. All materials used in the Work shall be furnished in sufficient quantities to facilitate the proper and expeditious execution of the Work and shall be new except such materials as may be expressly provided or allowed in the Contract Documents to be otherwise.

B. Whenever a product, material, system, item of equipment, or service is identified in the Contract Documents by reference to a trade name, manufacturer's name, model number, etc.(hereinafter

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

C. If the Contract Documents identify three or more sources for a product, material, system, item of equipment or service to be used and the list of sources is not followed by "or approved equal" or similar wording, the Contractor may make substitution only after evaluation by the Architect and execution of an appropriate Contract Change Order.

D. If the Contract Documents identify only one source and expressly provide that it is an approved sole source for the product, material, system, item of equipment, or service, the Contractor must furnish the identified sole source.

ARTICLE 14
SAFETY and PROTECTION of PERSONS and PROPERTY

A. The Contractor shall be solely and completely responsible for conditions at the Project site, including safety of all persons (including employees) and property. The Contractor shall create, maintain, and supervise conditions and programs to facilitate and promote safe execution of the Work, and shall supervise the Work with the attention and skill required to assure its safe performance. Safety provisions shall conform to OSHA requirements and all other federal, state, county, and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. Nothing contained in this Contract shall be construed to mean that the Owner has employed the Architect nor has the Architect employed its consultants to administer, supervise, inspect, or take action regarding safety programs or conditions at the Project site.

B. The Contractor shall employ Construction Methods, safety precautions, and protective measures that will reasonably prevent damage, injury or loss to:

(1) workers and other persons on the Project site and in adjacent and other areas that may be affected by the Contractor's operations;

(2) the Work and materials and equipment to be incorporated into the Work and stored by the Contractor on or off the Project site; and

(3) other property on, or adjacent to, the Project site, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and other improvements not designated in the Contract Documents to be removed, relocated, or replaced.

C. The Contractor shall be responsible for the prompt remedy of damage and loss to property, including the filing of appropriate insurance claims, caused in whole or in part by the fault or negligence of the Contractor, a Subcontractor, or anyone for whose acts they may be liable.

D. The Contractor shall comply with and give notices required by applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety and protection of persons or property, including without limitation notices to adjoining property owners of excavation or other construction activities that potentially could cause damage or injury to adjoining property or persons thereon.

E. The Contractor shall erect and maintain barriers, danger signs, and any other reasonable safeguards and warnings against hazards as may be required for safety and protection during performance of the Contract and shall notify owners and users of adjacent sites and utilities of conditions that may exist or arise which may jeopardize their safety.

F. If use or storage of explosives or other hazardous materials or equipment or unusual Construction Methods are necessary for execution of the Work, the Contractor shall exercise commensurate care and employ supervisors and workers properly qualified to perform such activity.

G. The Contractor shall furnish a qualified safety representative at the Project site whose duties shall include the prevention of accidents. The safety representative shall be the Contractor's superintendent, unless the Contractor assigns this duty to another responsible member of its on-site staff and notifies the Owner and Architect in writing of such assignment.

H. The Contractor shall not permit a load to be applied, or forces introduced, to any part of the construction or site that may cause damage to the construction or site or endanger safety of the construction, site, or persons on or near the site.

I. The Contractor shall have the right to act as it deems appropriate in emergency situations jeopardizing life or property. The Contractor shall be entitled to equitable adjustment of the Contract Sum or Contract Time for its efforts expended for the sole benefit of the Owner in an emergency. Such adjustment shall be determined as provided in Articles 19 and 20.

J. The duty of the Architect and the Architect's consultants to visit the Project site to conduct periodic inspections of the Work or for other purposes shall not give rise to a duty to review or approve the adequacy of the Contractor's safety program, safety supervisor, or any safety measure which Contractor takes or fails to take in, on, or near the Project site.

ARTICLE 15
HAZARDOUS MATERIALS

A. A Hazardous Material is any substance or material identified as hazardous under any federal, state, or local law or regulation, or any other substance or material which may be considered hazardous or otherwise subject to statutory or regulatory requirements governing its handling, disposal, and/or clean-up. Existing Hazardous Materials are Hazardous Materials discovered at the Project site and not introduced to the Project site by the Contractor, a Subcontractor, or anyone for whose acts they may be liable.

B. If, during the performance of the Work, the Contractor encounters a suspected Existing Hazardous Material, the Contractor shall immediately stop work in the affected area, take measures appropriate to the condition to keep people away from the suspected Existing Hazardous Material, and

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

C. The Owner shall obtain the services of an independent laboratory or professional consultant, appropriately licensed and qualified, to determine whether the suspected material is a Hazardous Material requiring abatement and, if so, to certify after its abatement that it has been rendered harmless. Any abatement of Existing Hazardous Materials will be the responsibility of the Owner. The Owner will advise the Contractor in writing of the persons or entities who will determine the nature of the suspected material and those who will, if necessary, perform the abatement. The Owner will not employ persons or entities to perform these services to whom the Contractor or Architect has reasonable objection.

D. After certification by the Owner's independent laboratory or professional consultant that the material is harmless or has been rendered harmless, work in the affected area shall resume upon written agreement between the Owner and Contractor. If the material is found to be an Existing Hazardous Material and the Contractor incurs additional cost or delay due to the presence and abatement of the material, the Contract Sum and/or Contract Time shall be appropriately adjusted by a Contract Change Order pursuant to Article 19.

E. The Owner shall not be responsible for Hazardous Materials introduced to the Project site by the Contractor, a Subcontractor, or anyone for whose acts they may be liable unless such Hazardous Materials were required by the Contract Documents.

ARTICLE 16
INSPECTION of the WORK

A. GENERAL

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

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

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

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

B. TYPES of INSPECTIONS

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

(a) Pre-construction Conference.

(b) Pre-roofing Conference (not applicable if the Contract involves no roofing work)

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

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

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

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

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

C. INSPECTIONS by the ARCHITECT

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

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

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

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

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

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

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

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

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

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

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

D. INSPECTIONS by the DCM PROJECT INSPECTOR

(1) The DCM Project Inspector will:

(a) participate in scheduled inspections and conferences as practicable,

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

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

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

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

(b) notify the Architect, Owner, and Contractor of Defective Work recognized by the DCM Project Inspector.

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

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

E. UNCOVERING WORK

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

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

F. SPECIFIED INSPECTIONS and TESTS

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

(2) If the Architect, Owner, or public authority having jurisdiction determines that inspections, tests, demonstrations, or approvals in addition to Specified Inspections and Tests are required, the Contractor shall, upon written instruction from the Architect, arrange for their performance by an entity acceptable to the Owner, giving timely notice to the architect of the time and place of their performance. Related costs shall be borne by the Owner unless the procedures reveal that Work is not in compliance with requirements of the Contract Documents, in which case the Contractor shall

bear the costs of correction, repeating the procedures, and any related costs incurred by the Owner, including reasonable charges, if any, by the Architect for additional services.

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

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

ARTICLE 17
CORRECTION of DEFECTIVE WORK

A. The Contractor shall, at the Contractor's expense, promptly correct Defective Work rejected by the Architect or which otherwise becomes known to the Contractor, removing the rejected or nonconforming materials and construction from the project site.

B. Correction of Defective Work shall be performed in such a timely manner as will avoid delay of completion, use, or occupancy of the Work and the work of the Owner and separate contractors.

C. The Contractor shall bear all expenses related to the correction of Defective Work, including but not limited to: **(1)** additional testing and inspections, including repeating Specified Inspections and Tests**, (2)** reasonable services and expenses of the Architect, and **(3)** the expense of making good all work of the Contractor, Owner, or separate contractors destroyed or damaged by the correction of Defective Work.

ARTICLE 18
DEDUCTIONS for UNCORRECTED WORK

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

ARTICLE 19
CHANGES in the WORK

A. GENERAL

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

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

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

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

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

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

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

B. DETERMINATION of ADJUSTMENT of the CONTRACT SUM

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

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

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

(3) Force Account. By directing the Contractor to proceed with the change in the Work on a "force account" basis under which the Contractor shall be reimbursed for reasonable expenditures incurred by the Contractor and its Subcontractors in performing added Work and the Owner shall receive reasonable credit for any deleted Work. The Contractor shall keep and present, in such form as the Owner may prescribe, an itemized accounting of the cost of the change together with

sufficient supporting data. Unless otherwise stated in the directive, the adjustment of the Contract Sum shall be limited to the following:

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

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

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

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

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

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

C. ADJUSTMENT of the CONTRACT TIME due to CHANGES

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

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

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

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

D. CHANGE ORDER PROCEDURES

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

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

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

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

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

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

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

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

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

ARTICLE 20
CLAIMS for EXTRA COST or EXTRA WORK

A. If the Contractor considers any instructions by the Architect, Owner, DCM Project Inspector, or public authority having jurisdiction to be contrary to the requirements of the Contract Documents and will involve extra work and/or cost under the Contract, the Contractor shall give the Architect written notice thereof within ten days after receipt of such instructions, and in any event before proceeding to execute such work. As used in this Article, "instructions" shall include written or

oral clarifications, directions, instructions, interpretations, or determinations.

B. The Contractor's notification pursuant to Paragraph 20.A shall state: (1) the date, circumstances, and source of the instructions, **(2)** that the Contractor considers the instructions to constitute a change to the Contract Documents and why, and **(3)** an estimate of extra cost and time that may be involved to the extent an estimate may be reasonably made at that time.

C. Except for claims relating to an emergency endangering life or property, no claim for extra cost or extra work shall be considered in the absence of prior notice required under Paragraph 20.A.

D. Within ten days of receipt of a notice pursuant to Paragraph 20.A, the Architect will respond in writing to the Contractor, stating one of the following:

(1) The cited instruction is rescinded.

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

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

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

ARTICLE 21
DIFFERING SITE CONDITIONS

A. DEFINITION

"Differing Site Conditions" are:

(1) subsurface or otherwise concealed physical conditions at the Project site which differ materially from those indicated in the Contract Documents, or

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

B. PROCEDURES

If Differing Site Conditions are encountered, then the party discovering the condition shall promptly notify the other party before the condition is disturbed and in no event later than ten days after discovering the condition. Upon such notice and verification that a Differing Site Condition exists, the Architect will, with reasonable promptness and with the Owner's concurrence, make changes in the Drawings and/or Specifications as are deemed necessary to conform to the Differing Site Condition. Any increase or decrease in the Contract Sum or Contract Time that is warranted by the changes will be made as provided under Article 19, Changes in the Work. If the Architect determines a Differing Site Condition has not been encountered, the Architect shall notify the

Owner and Contractor in writing, stating the reason for that determination.

ARTICLE 22
CLAIMS for DAMAGES

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

ARTICLE 23
DELAYS

A. A delay beyond the Contractor's control at any time in the commencement or progress of Work by an act or omission of the Owner, Architect, or any separate contractor or by labor disputes, unusual delay in deliveries, unavoidable casualties, fires, abnormal floods, tornadoes, or other cataclysmic events of nature, may entitle the Contractor to an extension of the Contract Time provided, however, that the Contractor shall, within ten days after the delay first occurs, give written notice to the Architect of the cause of the delay and its probable effect on progress of the entire Work.

B. Adverse weather conditions that are more severe than anticipated for the locality of the Work during any given month may entitle the Contractor to an extension of Contract Time provided, however;

(1) the weather conditions had an adverse effect on construction scheduled to be performed during the period in which the adverse weather occurred, which in reasonable sequence would have an effect on completion of the entire Work,

(2) the Contractor shall, within twenty-one days after the end of the month in which the delay occurs, give the Architect written notice of the delay that occurred during that month and its probable effect on progress of the Work, and

(3) within a reasonable time after giving notice of the delay, the Contractor provides the Architect with sufficient data to document that the weather conditions experienced were unusually severe for the locality of the Work during the month in question. Unless otherwise provided in the Contract Documents, data documenting unusually severe weather conditions shall compare actual weather conditions to the average weather conditions for the month in question during the previous five years as recorded by the National Oceanic and Atmospheric Administration (NOAA) or similar record-keeping entities.

C. Adjustments, if any, of the Contract Time pursuant to this Article shall be incorporated into the Contract by a Contract Change Order prepared by the Architect and signed by the Contractor, Owner, and other signatories to the Construction Contract or, at closeout of the Contract, by mutual written agreement between the Contractor and Owner. The adjustment of the Contract Time shall not exceed the extent to which the delay extends the time required to complete the entire Work of the Contract.

D. The Contractor shall not be entitled to any adjustment of the Contract Sum for damage due to delays claimed pursuant to this Article unless the delay was caused by the Owner or Architect and was either:

(1) the result of bad faith or active interference or

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

ARTICLE 24
RESOLUTION of CLAIMS and DISPUTES

A. APPLICABILITY of ARTICLE

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

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

B. CONTINUANCE of PERFORMANCE

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

C. GOOD FAITH EFFORT to SETTLE

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

D FINAL RESOLUTION for STATE-FUNDED CONTRACTS

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

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

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

E. FINAL RESOLUTION for LOCALLY-FUNDED CONTRACTS

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

ARTICLE 25
OWNER'S RIGHT to CORRECT DEFECTIVE WORK

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

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

A. STOPPING the WORK for CAUSE

If the Contractor fails to correct Defective Work or persistently fails to carry out Work in accordance with the Contract Documents, the Owner may direct the Contractor in writing to stop the Work, or any part of the Work, until the cause for the Owner's directive has been eliminated; however, the Owner's right to stop the Work shall not be construed as a duty of the Owner to be exercised for the benefit of the Contractor or any other person or entity.

B. SUSPENSION by the OWNER for CONVENIENCE

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

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

ARTICLE 27
OWNER'S RIGHT to TERMINATE CONTRACT

A. TERMINATION by the OWNER for CAUSE

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

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

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

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

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

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

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

(2) Procedure for Unbonded Construction Contracts (Generally, contracts less than $100,000):

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

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

(c) If the Contractor satisfies a Notice to Cure, but the condition for which the notice was first given reoccurs, the Owner may give the Contractor a seven day Notice of Termination

without giving the Contractor another Notice to Cure.

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

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

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

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

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

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

(3) Procedure for Bonded Construction Contracts (Generally, contracts of $100,000 or more):

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

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

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

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

(e) Surety Claims: Upon receiving the Owner's demand on the Performance Bond, the Surety shall assume all rights and obligations of the Contractor under the Contract. However, the Surety shall also have the right to assert "Surety Claims" to the Owner, which are defined as claims relating to acts or omissions of the Owner or Architect prior to termination of the Contractor which may have prejudiced its rights as Surety or its interest in the unpaid balance of the Contract Sum. If the Surety wishes to assert a Surety Claim, it shall give the Owner, through the Architect, written notice within twenty-one days after first recognizing the condition giving rise to the Surety Claim. The Surety Claim shall then be submitted to the Owner, through the Architect, no later than sixty days after giving notice thereof, but no such Surety Claims shall be considered if submitted after the date upon which final payment

becomes due. Final resolution of Surety Claims shall be pursuant to Article 24, Resolution of Claims and Disputes. The presence or possibility of a Surety Claim shall not be just cause for the Surety to fail or refuse to take charge of and complete the Work or for the Owner to fail or refuse to continue to make payments in accordance with the Contract Documents.

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

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

B. TERMINATION by the OWNER for CONVENIENCE

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

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

(a) stop Work as specified in the notice;

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

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

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

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

(3) In the event of Termination for Convenience, the Contractor shall be entitled to receive payment for the Work performed prior to its termination, including materials and equipment purchased and delivered for incorporation into the terminated Work, and any reasonable costs incurred because of the termination. Such payment shall include reasonable mark-up of costs for overhead and profit, not to exceed the limits stated in Article 19, Changes in the Work. The Contractor shall be entitled to receive payment for reasonable anticipated overhead ("home office") and shall not be entitled to receive payment for any profits anticipated to have been gained from the terminated Work. A proposal for decreasing the Contract Sum shall be submitted to the Architect by the Contractor in such time and detail, and with such supporting documentation, as is reasonably directed by the Owner. Final modification of the Contract shall be by Contract Change Order pursuant to Article 19. Any Claim or Dispute involving the termination or any amount due a party as a result shall be resolved pursuant to Article 24.

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

A. SUSPENSION by the OWNER

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

B. NONPAYMENT

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

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

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

ARTICLE 29
PROGRESS PAYMENTS

A. FREQUENCY of PROGRESS PAYMENTS

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

B. SCHEDULE of VALUES

Within ten days after receiving the Notice to Proceed the Contractor shall submit to the Architect a DCM Form C-10SOV, Schedule of Values, which is a breakdown of the Contract Sum showing the value of the various parts of the Work for billing purposes. The Schedule of Values shall be printable on 8.5" × 11" and shall divide the Contract Sum into as many parts ("line items") as the Architect and Owner determine necessary to permit evaluation and to show amounts attributable to

Subcontractors. The Contractor's overhead and profit are to be proportionately distributed throughout the line items of the Schedule of Values. Upon approval, the Schedule of Values shall be used as a basis for monthly Applications for Payment, unless it is later found to be in error. Approved change order amounts shall be added to or incorporated into the Schedule of Values as mutually agreed by the Contractor and Architect.

C. APPLICATIONS for PAYMENTS

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

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

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

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

D. MATERIALS STORED OFF SITE

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

(1) the contractor has received written approval from the Architect and Owner to store the materials or equipment off site in advance of delivering the materials to the off site location;

(2) a Certificate of Insurance is furnished to the Architect evidencing that a special insurance policy, or rider to an existing policy, has been obtained by the Contractor providing all-risk property insurance coverage, specifically naming the materials or equipment stored, and naming the Owner as an additionally insured party;

(3) the Architect is provided with a detailed inventory of the stored materials or equipment and the materials or equipment are clearly marked in correlation to the inventory to facilitate inspection and verification of the presence of the materials or equipment by the Architect or Owner;

(4) the materials or equipment are properly and safely stored in a bonded warehouse, or a facility otherwise approved in advance by the Architect and Owner; and

(5) compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest.

E. RETAINAGE

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

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

F. CONTRACTOR'S CERTIFICATION

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

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

G. PAYMENT ESTABLISHES OWNERSHIP

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

ARTICLE 30
CERTIFICATION and APPROVALS for PAYMENT

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

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

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

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

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

C. Neither the Architect's issuance of a Certificate for Payment nor the Owner's resulting progress payment shall be a representation to the Contractor that the Work in progress or completed at that time is accepted or deemed to be in conformance with the Contract Documents.

D. The Architect shall not be required to determine that the Contractor has promptly or fully paid Subcontractors and suppliers or how or for what purpose the Contractor has used monies paid under the Construction Contract. However, the Architect may, upon request and if practical, inform any Subcontractor or supplier of the amount, or percentage of completion, approved or paid to the Contractor on account of the materials supplied or the Work performed by the Subcontractor.

ARTICLE 31
PAYMENTS WITHHELD

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

(1) Defective Work;
(2) filed, or reasonable evidence indicating probable filing of, claims arising out of the Contract by other parties against the Contractor;
(3) the Contractor's failure to pay for labor, materials or equipment or to pay Subcontractors;
(4) reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
(5) damage suffered by the Owner or another contractor caused by the Contractor, a Subcontractor, or anyone for whose acts they may be liable;
(6) reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance is insufficient to cover applicable liquidated damages; or
(7) the Contractor's persistent failure to conform to the requirements of the Contract Documents.

B. If the Owner deems it necessary to withhold payment pursuant to preceding Paragraph A, the Owner will notify the Contractor and Architect in writing of the amount to be withheld and the reason for same.

C. The Architect shall not be required to withhold payment for completed or partially completed Work for which compliance with the Contract Documents remains to be determined by Specified Inspections or Final Inspections to be performed in their proper sequence. However, if Work for which payment has been approved, certified, or made under an Application for Payment is subsequently determined to be Defective Work, the Architect shall determine an appropriate amount that will protect the Owner's interest against the Defective Work.

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

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

D. The amount withheld will be paid with the next Application for Payment certified and approved after the condition for which the Owner has withheld payment is removed or otherwise resolved to the Owner's satisfaction.

E. The Owner shall have the right to withhold from payments due the Contractor under this Contract an amount equal to any amount which the Contractor owes the Owner under another contract.

ARTICLE 32
SUBSTANTIAL COMPLETION

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

B. The Contractor shall notify the Architect in writing when it considers the Work, or a portion of the Work which the Owner has agreed to accept separately, to be substantially complete and ready for a Final Inspection pursuant to Article 16. In this notification the Contractor shall identify any items remaining to be completed or corrected for Final Acceptance prior to final payment.

C. Substantial Completion is achieved and a Final Inspection is appropriate only when a minimal number of punch list items exists and only a short period of time will be required to correct or complete them. Upon receipt of the Contractor's notice for a Final Inspection, the Architect will advise the Contractor in writing of any conditions of the Work which the Architect or Owner is

aware do not constitute Substantial Completion, otherwise, a Final Inspection will proceed within a reasonable time after the Contractor's notice is given. However, the Architect will not be required to prepare lengthy listings of punch list items; therefore, if the Final Inspection discloses that Substantial Completion has not been achieved, the Architect may discontinue or suspend the inspection until the Contractor does achieve Substantial Completion.

D. CERTIFICATE of SUBSTANTIAL COMPLETION

(1) When the Work or a designated portion of the Work is substantially complete, the Architect will prepare (via the appropriate DocuSign link available from DCM's Engage Portal at https://engagealabama-rpm.facilityforce.cloud) and sign a Certificate of Substantial Completion to be signed in order by the Contractor, Owner, and Alabama Division of Construction Management.

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

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

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

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

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

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

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

ARTICLE 33
OCCUPANCY or USE PRIOR to COMPLETION

A. UPON SUBSTANTIAL COMPLETION

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

B. BEFORE SUBSTANTIAL COMPLETION

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

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

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

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

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

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

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

ARTICLE 34
FINAL PAYMENT

A. PREREQUISITES to FINAL PAYMENT

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

(1) Full execution of a Certificate of Substantial Completion for the Work, or each designated portion of the Work.

(2) Final Acceptance of the Work.

(3) The Contractor's completion, to the satisfaction of the Architect and Owner, of all documentary requirements of the Contract Documents; such as delivery of "as-built" documents, operating and maintenance manuals, warranties, etc.

(4) Delivery to the Owner of a final Application for Payment, prepared by the Contractor and approved and certified by the Architect. Architect prepares DCM Form B-13: Final Payment Checklist and forwards it to the Owner along with the final Application for Payment.

(5) Completion of an Advertisement for Completion pursuant to Paragraph C below.

(6) Delivery by the Contractor to the Owner through the Architect of DCM Form C-18: Contractor's Affidavit of Payment of Debts and Claims, and a Release of Claims, if any, and such other documents as may be required by Owner, satisfactory in form to the Owner pursuant to Paragraph D below.

(7) Consent of Surety to Final Payment, if any, to Contractor. This Consent of Surety is required for projects which have Payment and Performance Bonds.

(8) Delivery by the Contractor to the Architect and Owner of other documents, if any, required by the Contract Documents as prerequisites to Final Payment.

(9) See Manual of Procedures Chapter 7, Section L.7 concerning reconciliation of contract time, if any.

B. FINAL ACCEPTANCE of the WORK

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

C. ADVERTISEMENT for COMPLETION

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

(2) If the Contract Sum is $100,000 or more: The Contractor, immediately after being notified by the Architect that all other requirements of the Contract have been completed, shall give public notice of completion of the Contract by having an Advertisement for Completion, similar to the sample contained in the Project Manual, published for a period of three weeks. The contractor can publish a notice in one or more of the following ways:

(a) In a newspaper of general circulation in the county or counties in which the work, or some portion thereof, has been done.

(b) On a website that is maintained by a newspaper of general circulation in the county or counties in which the work, or some portion thereof, has been done. (c) On a website utilized by the awarding authority for publishing notices.

(d) If no newspaper is published in the county in which the work was done, and if the awarding authority does not utilize a website for the purpose of publishing notices, the notice may be given by posting at the courthouse for 30 days, and proof of the posting of the notice shall be given by the awarding authority and the contractor.

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

D. RELEASE of CLAIMS

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

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

(2) An affidavit under oath, if required, stating that so far as the Contractor has knowledge or information, there are no claims or claims of lien which have been or will be filed by any Subcontractor, Supplier or other party for labor or material for which a claim or claim of lien could be filed.

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

E. EFFECT of FINAL PAYMENT

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

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

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

ARTICLE 35
CONTRACTOR'S WARRANTY

A. GENERAL WARRANTY

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

B. ONE-YEAR WARRANTY

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

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

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

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

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

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

C. GENERAL CONTRACTOR'S ROOFING GUARANTEE

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

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

(3) This guarantee does not include costs which might be incurred by the General Contractor in making visits to the site requested by the Owner regarding roof problems that are due to lack of proper maintenance (keeping roof drains and/or gutters clear of debris that cause a stoppage of drainage which results in water ponding, overflowing of flashing, etc.), or damages caused by vandalism or misuse of roof areas. Should the contractor be required to return to the job to correct problems of this nature that are determined not to be related to faulty workmanship and materials in the installation of the roof, payment for actions taken by the Contractor in response to such request will be the responsibility of the Owner. A detailed written report shall be made by the General Contractor on each of these 'Service Calls' with copies to the Architect, Owner and Division of Construction Management.

D. SPECIAL WARRANTIES

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

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

E. ASSUMPTION of GUARANTEES of OTHERS

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

ARTICLE 36
INDEMNIFICATION AGREEMENT

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

A. This indemnification shall extend to all claims, damages, losses and expenses for injury or damage to adjacent or neighboring property, or persons injured thereon, that arise out of, relate to, or result from performance of the Work.

B. This indemnification does not extend to the liability of the Architect, or the Architect's Consultants, agents, or employees, arising out of **(1)** the preparation or approval of maps, shop drawings, opinions, reports, surveys, field orders, Change Orders, drawings or specifications, or **(2)** the giving of or the failure to give directions or instructions, provided such giving or failure to give instructions is the primary cause of the injury or damage.

C. This indemnification does not apply to the extent of the sole negligence of the Indemnitees.

ARTICLE 37
CONTRACTOR'S and SUBCONTRACTORS' INSURANCE

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

A. GENERAL

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

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

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

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

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

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

B. INSURANCE COVERAGES

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

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

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

(b) Employer's Liability Insurance limits shall be at least:

.1 Bodily Injury by Accident - $1,000,000 each accident

.2 Bodily Injury by Disease - $1,000,000 each employee

(2) COMMERCIAL GENERAL LIABILITY INSURANCE

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

Coverage	Limit
.1 General Aggregate	$ 2,000,000.00 per Project
.2 Products, Completed Operations Aggregate	$ 2,000,000.00 per Project
.3 Personal and Advertising Injury	$ 1,000,000.00 per Occurrence
.4 Each Occurrence	$ 1,000,000.00

(b) Additional Requirements for Commercial General Liability Insurance:

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

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

(3) COMMERCIAL BUSINESS AUTOMOBILE LIABILITY INSURANCE

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

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

(4) COMMERCIAL UMBRELLA OR COMMERCIAL EXCESS LIABILITY INSURANCE

(a) Commercial Umbrella or Commercial Excess Liability Insurance to provide excess coverage above the Commercial General Liability, Commercial Business Automobile

Liability and the Workers' Compensation and Employer's Liability to satisfy the minimum limits set forth herein.

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

.1 $ 5,000,000 per Occurrence

.2 $ 5,000,000 Aggregate

(c) Additional Requirements for Commercial Umbrella or Commercial Excess Liability Insurance:

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

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

(5) BUILDER'S RISK INSURANCE

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

(b) The policy shall be endorsed as follows:

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

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

(ii) Partial or complete occupancy by Owner; or

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

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

C. SUBCONTRACTORS' INSURANCE

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

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

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

D. TERMINATION of OBLIGATION to INSURE

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

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

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

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

E. WAIVERS of SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors performing construction or operations related to the Project, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss. But said waiver shall apply only to the extent the loss or damage is covered by builder's risk insurance applicable to the Work or to other property located within or adjacent to the Project, except such rights as they may have to proceeds of such insurance held by the Owner or Contractor as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors, if any, and the subcontractor, sub-subcontractors, suppliers, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The Policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to the person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged. The waivers provided for in this paragraph shall not be applicable to loss or damage that occurs after final acceptance of the Work. Any provision found herein which attempts to waive or invalidate the subrogation interests of Alabama's State Insurance Fund against any party to this contract or any other person or entity is void and invalid. No such waiver is intended or made by the parties to this agreement with regard to any property insured by the State Insurance Fund.

ARTICLE 38
PERFORMANCE and PAYMENT BONDS

A. GENERAL

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

The provisions of this Article are not applicable to this Contract if the Contract Sum is less than $100,000, unless bonds are required for this Contract in the Supplemental General Conditions.

B. PERFORMANCE BOND

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

C. PAYMENT BOND

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

D. CHANGE ORDERS

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

E. EXPIRATION

The obligations of the Contractor's performance bond surety shall be coextensive with the

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

ARTICLE 39
ASSIGNMENT

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

ARTICLE 40
CONSTRUCTION by OWNER or SEPARATE CONTRACTORS

A. OWNER'S RESERVATION of RIGHT

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

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

B. COORDINATION

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

C. CONDITIONS APPLICABLE to WORK PERFORMED by OWNER

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

D. MUTUAL RESPONSIBILITY

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

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

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

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

ARTICLE 41
SUBCONTRACTS

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

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

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

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

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

B. SUBCONTRACTUAL RELATIONS

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

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

ARTICLE 42
ARCHITECT'S STATUS

A. The Architect is an independent contractor performing, with respect to this Contract, pursuant to an agreement executed between the Owner and the Architect. The Architect has prepared the Drawings and Specifications and assembled the Contract Document and is, therefore, charged with their interpretation and clarification as described in the Contract Documents. As a representative of the Owner, the Architect will endeavor to guard the Owner against variances from the requirements of the Contract Documents by the Contractor. On behalf of the Owner, the Architect will administer the Contract as described in the Contract Documents during construction and the Contractor's one-year warranty.

B. So as to maintain continuity in administration of the Contract and performance of the Work, and to facilitate complete documentation of the project record, all communications between the Contractor and Owner regarding matters of or related to the Contract shall be directed through the Architect, unless direct communication is otherwise required to provide a legal notification. Unless otherwise authorized by the Architect, communications by and with the Architect's consultants shall be through the Architect. Unless otherwise authorized by the Contractor, communications by and with Subcontractors and material suppliers shall be through the Contractor.

C. ARCHITECT'S AUTHORITY

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

(1) The Architect is authorized to:

- **(a)** approve "minor" deviations as defined in Article 9, Submittals,
- **(b)** make "minor" changes in the Work as defined in Article 19, Changes in the Work,
- **(c)** reject or require the correction of Defective Work,
- **(d)** require the Contractor to stop the performance of Defective Work,
- **(e)** adjust an Application for Payment by the Contractor pursuant to Article 30, Certification

and Approval of payments, and
(f) issue Notices to Cure pursuant to Article 27.

(2) The Architect is not authorized to:
(a) revoke, alter, relax, or waive any requirements of the Contract Documents (other than "minor" deviations and changes) without concurrence of the Owner,
(b) finally approve or accept any portion of the Work without concurrence of the Owner,
(c) issue instructions contrary to the Contract Documents,
(d) issue Notice of Termination or otherwise terminate the Contract, or
(e) require the Contractor to stop the Work except only to avoid the performance of Defective Work.

D. LIMITATIONS of RESPONSIBILITIES

(1) The Architect shall not be responsible to Contractors or to others for supervising or coordinating the performance of the Work or for the Construction Methods or safety of the Work, unless the Contract Documents give other specific instructions concerning these matters.
(2) The Architect will not be responsible to the Contractor (nor the Owner) for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents or for acts or omissions of the Contractor, a Subcontractor, or anyone for whose acts they may be liable. However, the Architect will report to the Owner and Contractor any Defective Work recognized by the Architect.

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

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

E. ARCHITECT'S DECISIONS

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

ARTICLE 43
CASH ALLOWANCES

A. All allowances stated in the Contract Documents shall be included in the Contract Sum. Items covered by allowances shall be supplied by the Contractor as directed by the Architect or Owner

and the Contractor shall afford the Owner the economy of obtaining competitive pricing from responsible bidders for allowance items unless other purchasing procedures are specified in the Contract Documents.

B. Unless otherwise provided in the Contract Documents:

(1) allowances shall cover the cost to the Contractor of materials and equipment delivered to the Project site and all applicable taxes, less applicable trade discounts;

(2) the Contractor's costs for unloading, storing, protecting, and handling at the site, labor, installation, overhead, profit and other expenses related to materials or equipment covered by an allowance shall be included in the Contract Sum but not in the allowances;

(3) if required, the Contract Sum shall be adjusted by Change Order to reflect the actual costs of an allowance.

C. Any selections of materials or equipment required of the Architect or Owner under an allowance shall be made in sufficient time to avoid delay of the Work.

ARTICLE 44
PERMITS, LAWS, and REGULATIONS

A. PERMITS, FEES AND NOTICES

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

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

B. TAXES

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

C. COMPENSATION for INCREASES

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

D. ALABAMA IMMIGRATION LAW

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

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

E. ALABAMA TRADE BOYCOTT LAW

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

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

EE. ALABAMA ECONOMIC BOYCOTT LAW

Per Act 2023-409 as codified in Title 41, Chapter 16, Article 1 of the Code of Alabama, 1975, as amended:

The contracting parties affirm, for the duration of the agreement, that they are not currently engaged in, and will not engage in, economic boycotts.

F. ACCOUNTING OF SALES TAX EXEMPT PROJECTS

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

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

ARTICLE 45
ROYALTIES, PATENTS, and COPYRIGHTS

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

infringement of a patent or copyright, the Contractor shall be responsible for any resulting loss unless such information is promptly furnished to the Architect.

ARTICLE 46
USE of the SITE

A. The Contractor shall confine its operations at the Project site to areas permitted by the Owner and by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials, equipment, employees' vehicles, or debris. The Contractor's operations at the site shall be restricted to the sole purpose of constructing the Work, use of the site as a staging, assembly, or storage area for other business which the Contractor may undertake shall not be permitted.

B. Unless otherwise provided in the Contract Documents, temporary facilities, such as storage sheds, shops, and offices may be erected on the Project site with the approval of the Architect and Owner. Such temporary buildings and/or utilities shall remain the property of the Contractor, and be removed at the Contractor's expense upon completion of the Work, unless the Owner authorizes their abandonment without removal.

ARTICLE 47
CUTTING and PATCHING

A. The Contractor shall be responsible for all cutting, fitting, or patching that may be required to execute the Work to the results indicated in the Contract Documents or to make its parts fit together properly.

B. Any cutting, patching, or excavation by the Contractor shall be supervised and performed in a manner that will not endanger persons nor damage or endanger the Work or any fully or partially completed construction of the Owner or separate contractors.

ARTICLE 48
IN-PROGRESS and FINAL CLEANUP

A. IN-PROGRESS CLEAN-UP

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

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

B. FINAL CLEAN-UP

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

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

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

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

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

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

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

C. OWNER'S RIGHT to CLEAN-UP

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

ARTICLE 49
LIQUIDATED DAMAGES

A. Time is the essence of the Contract. Any delay in the completion of the Work required by the Contract Documents may cause inconvenience to the public and loss and damage to the Owner including but not limited to interest and additional administrative, architectural, inspection and supervision charges. By executing the Construction Contract, the Contractor agrees that the Contract Time is sufficient for the achievement of Substantial Completion.

B. The Contract Documents may provide in the Construction Contract or elsewhere for a certain dollar amount for which the Contractor and its Surety (if any) will be liable to the Owner as liquidated damages for each calendar day after expiration of the Contract Time that the Contractor fails to achieve Substantial Completion of the Work. If such daily liquidated damages are provided for, Owner and Contractor, and its Surety, agree that such amount is reasonable and agree to be bound thereby.

C. If a daily liquidated damage amount is not otherwise provided for in the Contract Documents, a time charge equal to six percent interest per annum on the total Contract Sum may be made against the Contractor for the entire period after expiration of the Contract Time that the Contractor fails to achieve Substantial Completion of the Work.

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

ARTICLE 50
USE of FOREIGN MATERIALS

A. In the performance of the Work the Contractor agrees to use materials, supplies, and products manufactured, mined, processed or otherwise produced in the United States or its territories, if same are available at reasonable and competitive prices and are not contrary to any sole source specification implemented under the Public Works Law.

B. In the performance of the Work the Contractor agrees to use iron or steel, that are made a permanent part of the structure, produced in the United States if the Contract Documents require the use of iron or steel and do not limit its supply to a sole source pursuant to the Public Works Law. If the Owner decides that the procurement of domestic steel products becomes impractical as a result of national emergency, national strike, or other cause, the Owner shall waive this restriction.

C. If domestic steel or other domestic materials, supplies, and products are not used in accordance with preceding Paragraphs A and B, the Contract Sum shall be reduced by an amount equal to any savings or benefits realized by the Contractor.

D. This Article applies only to Public Works projects financed entirely by the State of Alabama or any political subdivision of the state.

ARTICLE 51
PROJECT SIGN

A. Fully locally-funded State Agency and Public Higher Education projects: DCM Form C-15: Detail of Project Sign must be included in the project manual regardless of expected bid amount. If the awarded contract sum is $100,000.00 or more, Contractor shall furnish and erect a project sign. Other conditions besides the contract sum may warrant waiver of this requirement, but only with approval of the Technical Staff.

B. Fully locally-funded K-12 school projects: Project sign is not required unless requested by Owner; if project sign is requested by Owner, include DCM Form C-15: Detail of Project Sign in the project manual.

C. Partially or fully PSCA-funded projects: DCM Form C-15: Detail of Project Sign must be included in the project manual. Contractor shall furnish and erect a project sign for all PSCA-funded projects, regardless of the contract sum. "Alabama Public School and College Authority" as well as the local owner entity must be included as awarding authorities on the project sign of all PSCA-funded projects.

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

END of
GENERAL CONDITIONS of the CONTRACT

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ARTICLE 37
CONTRACTOR'S and SUBCONTRACTORS' INSURANCE

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

A. GENERAL

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

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

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

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

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

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

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

B. INSURANCE COVERAGES

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

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

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

(b) Employer's Liability Insurance limits shall be at least:

.1 Bodily Injury by Accident - $1,000,000 each accident

.2 Bodily Injury by Disease - $1,000,000 each employee

(2) COMMERCIAL GENERAL LIABILITY INSURANCE

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

Coverage	Limit
.1 General Aggregate	$ 2,000,000.00 per Project
.2 Products, Completed Operations Aggregate	$ 2,000,000.00 per Project
.3 Personal and Advertising Injury	$ 1,000,000.00 per Occurrence
.4 Each Occurrence	$ 1,000,000.00

(b) Additional Requirements for Commercial General Liability Insurance:

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

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

(3) COMMERCIAL BUSINESS AUTOMOBILE LIABILITY INSURANCE

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

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

(4) COMMERCIAL UMBRELLA OR COMMERCIAL EXCESS LIABILITY INSURANCE

(a) Commercial Umbrella or Commercial Excess Liability Insurance to provide excess

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

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

.1 $ 5,000,000 per Occurrence

.2 $ 5,000,000 Aggregate

(c) Additional Requirements for Commercial Umbrella or Commercial Excess Liability Insurance:

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

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

(5) BUILDER'S RISK INSURANCE

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

(b) The policy shall be endorsed as follows:

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

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

(ii) Partial or complete occupancy by Owner; or

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

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

C. SUBCONTRACTORS' INSURANCE

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

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

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

D. TERMINATION of OBLIGATION to INSURE

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

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

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

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

E. WAIVERS of SUBROGATION

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

SECTION DCM

SUPPLEMENTARY CONDITIONS

A. GENERAL

1. **General Conditions, Etc.** (See Article 2C): The printed form "General Conditions of the Contract" (DCM Form C-8), is part of these specifications and is bound hereinbefore. In case of conflict, these "Supplementary Conditions take precedence over said DCM printed forms; unaltered provisions of altered parts remain in effect.

2. **General Requirements**: Additional provisions are set forth in Division One of the specifications. Such supplements amplify the Supplementary Conditions but do not modify them.

3. **Statutory Requirements** (Add to Article 44A): Comply with applicable laws and regulations of Federal, State, County and Municipal Governments. In case of conflict the most stringent requirement shall apply. Furnish certificates of inspection from all authorities having jurisdiction.

4. **Contract Award**: If made, award will be on the standard DCM Contract Form and work shall commence with adequate force within ten days of date of Notice to Proceed thence to proceed with dispatch until fully completed.

5. **Information From the Owner** (Add to Article 1E): Reports of surveys, conditions, legal description, borings, measured drawings, etc. included on the drawings or in the Project Manual are provided for the Contractors' convenience in conducting his site examination and are not to be considered as part of the Contract Documents unless indicated otherwise herein. The Contractor should not rely on any such data that can be verified by measurement or observation, or from line locator services of public utilities, municipalities, or the Owner's staff. Except as otherwise noted, such material as is so provided represents the extent of data to be supplied by the Owner.

6. **Correlation of Documents** (Add to Article 1E & 2C): For purposes of establishing precedence and resolving discrepancies, the Supplements to Drawings (Division 17 of Project Manual) shall be considered details and drawings, same as if they appeared on the set of working drawings.

   The Contract Documents shall not be construed to create a contractual relationship with, or a cause of action in favor of, any third party against either the Owner or the Contractor. However, the Architect shall be entitled to rely on the performance of both as necessary to the performance of his duties related to this project.

7. **Dispute Resolution** (Clarify Article 24E): By execution of the Construction Contract, the Owner and the Contractor shall have agreed that disputes between them and arising out of this work shall be submitted for resolution by the Director as is outlined in Article 24D.

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8. **Ownership of Drawings**: (Add to Article 5): These Contract Documents are Copyright Reserved Documents of PH&J Architects, Inc. and not to be reproduced by anyone in any form partial or full sets, except as stated in the Advertisement.

B. OWNER, DIRECTOR & ARCHITECT

1. **Owner** (Add to Article 1M): Use of term herein refers to the **ALABAMA INDUSTRIAL DEVELOPMENT TRAINING**. Except as otherwise stated, all papers required to be delivered to the Owner shall be forwarded through the Architect.

2. **Commission and Director**: These terms are as defined in the printed General Conditions, Article 1. The Director's address is Suite 444, 770 Washington Avenue, Montgomery, AL 36130.

3. **Architect**: The term "Architect" used herein refers to PH&J Architects, Inc., whose offices are located at 807 South McDonough St., Montgomery, AL 36104.

4. **Architect's Status** (Clarification of Articles 9, 16C and 42): The Architect will make periodic visits to the site to generally familiarize himself with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Contract Documents. On the basis of his observations, he will keep the Owner informed of the progress of the Work and will endeavor to guard the Owner against deficiencies in the Work of the Contractor. The Architect will not make exhaustive or continuous on-site inspections to check the quality or quantity of the Work, the sequences or procedures, or for safety inspections, precautions and programs in connection with the Work, and he will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

   Nothing contained in the contract Documents shall create any contractual relationship between the Architect and the Contractor.

   The Architect has no authority to stop the work and Paragraphs 16-C (4), and 42-C (1D) are deleted. The work may be stopped only upon written order signed by the Owner or the Director.

   Pursuant to Par 9-I (2), the Architect will review only submittals which are required to be submitted.

   Reporting of Defective Work to the Owner, Contractor and DCM Project Inspector will include only items which, in the Architect's opinion, are of significance and the written reporting thereof is in the Owner's interest.

   Delete Par 42-D (1) and substitute: The Architect will not be responsible to Contractors or others for supervising or coordinating the work, or for construction methods or safety. If the Contract Documents give any specific instructions regarding these matters and the Contractor has objections thereto, he shall state the objection in writing and secure instructions before proceeding. Otherwise, the Contractor shall have assumed sole responsibility for a successful and safe operation.

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The Architect has not been employed to carry out inspections mandated by Chapter 17 of the IBC. Such inspection services are incorporated herein via independent laboratory services (see Section 0140) or are to be otherwise provided by the Owner or the authorities having jurisdiction.

5. **Defective Work** (Article 1, Par I): Delete Line Item (4) and substitute: (4) Temporary Construction which is specified and described to protect the Owner's existing contiguous improvements.

   Add the following paragraph at the end of Par I: "Unsatisfactory or unsuccessful temporary supports or construction which facilitates construction safety or means and methods (i.e., trenching, hoisting, excavating, forming, shoring, barricades, railings, lighting, staging, etc.) are excluded from the preview and responsibility of the Architect, and shall be corrected by the Contractor on his own recognizance."

C. CONTRACTOR'S OBLIGATIONS

1. **Administration and Supervision** (addition to Article 6 & 12): The Contractor shall schedule and coordinate the Work to meet the completion date and honor any phasing constraints. He shall reschedule and re-coordinate the work to avoid or mitigate damage to, or claims against himself, the Owner or the Architect, as might result from a change order, strike, fire, flood, unforeseen conditions, accident, court order, or other cause which might impact the construction process. He shall ensure that subcontractors are familiar with and carry out their contract requirements.

   Add to Article 6-B (1): The contractor shall not remove a Superintendent who is satisfactory to both him and the Architect, except with the Architect's consent, unless he ceases to being his employ.

   Add to Article 6-A (1): If the Contract Documents give specific instructions regarding Construction Methods to be employed, the Contractor shall be solely responsible for the safe and successful performance of the work unless he has made reasonable objection in writing to such instructions before proceeding.

2. **Permits, Tests and Taxes** (additions to Article 44): The Contractor shall also pay cost of permits, inspections, tests, sales and use tax (see exemption), approvals, etc. which are legal requirements as of bid date, or which became so (or are increased) thereafter. Cost of laboratory tests shall be paid as noted in Section 0140. Contract sum will be increased to account for any increase in sales or use tax imposed after the bid date and before purchase.

   See the attachment in reference to Attorney General's Opinion relating to permits and inspections.

   Alabama Division of Construction Management Permit Fees: See the "Alabama Department of Finance Real Property Management Division of Construction Management Form" in reference to "Permit Fee & Permit Re-inspection Fee Calculation Worksheet", herein. **Note**: This permit fee is due prior to the Pre-construction Conference.

   The Building Permit secured by the General Contractor shall include in the scope of activity the work by separate contractors on the same structure (i.e., seating, food service equipment, landscaping, bank equipment, stage equipment).

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Except as noted, the Owner will secure and pay cost of all easements, zoning variances, etc. made necessary by construction of the project.

Sales Tax Exemption: This project qualifies for Sales and Use Tax Exemption under Act No.2013-205 of the Alabama Legislature. Any contractor or sub-contractor who purchases tangible personal property to be incorporated into the realty pursuant to this contract for construction shall obtain and execute a Sales and Use Tax Certificate of Exemption from the State of Alabama Department of Revenue and cooperate with the Owner in maintaining tax exempt status of this project. As a convenience a copy of the Accounting of Sales Tax Attachment to the DCM Form C-3 PROPOSAL FORM is bound herein to be turned in with the bid proposal.

Included herein is an "Alabama Department of Revenue Notice" regarding "Tax Guidance for contractors, subcontractors and Alabama Governmental entities regarding construction related contracts."

Storm Water Permit: In-as-much as this project involves potential storm water pollution from a construction site exceeding 1 acre, the Contractor shall make application for, and pay all fees as required to secure a NPDES Permit for Storm Water Discharge from the Alabama Department of Environmental Management. The Contractor shall conduct his operations and make all routine sampling and tests and file reports as required thereby. The Civil Engineer Consultant for this project is familiar with these regulations and can assist the Contractor in obtaining the permit if needed.

3. **Notice of Inspection** (Add to Article 16): Give ample notice of readiness of portion of the work for observation by the Architect. Any work covered before such a required verification shall be uncovered at the Contractor's expense. Acceptance or approval shall not relieve Contractor of responsibility for defects which subsequently develop or become apparent.

   Requests for final inspections shall be in the form of a written request stating that all work is substantially complete and ready for final review by the Owner, Architect and State Division of Construction Management staff.

4. **Safety Precautions and Programs** (additions to Article 14): The Contractor shall provide and maintain such safety programs and facilities as will adequately protect both people and property. He shall specifically comply with Par. 4.6.11 of NFPA 101. He shall designate a responsible employee at the site whose duty shall be the prevention of accidents; unless otherwise designated in writing this person shall be the Contractor's Superintendent.

   Reference in these specifications to an established rule or regulation pertaining to matters of safety is not intended to imply that the Architect will have any responsibility to monitor or enforce the measures so referenced.

5. **Workmanship** (Addition to Article 6A): Where final or finish lines or surfaces are specified to meet a certain standard, the substrate or adjacent surface shall be constructed sufficiently smooth or accurate to permit the standard to be met. The Contractor shall coordinate and perform work in a logical sequence so that one trade will not damage the finish work of another, and he shall inspect portions of work already performed to insure that such portions are in proper condition to receive subsequent work.

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6. **Construction Involvement** (Add to Article 6B): The Contractor's staff shall actually and actively be involved in the direction, coordination and control of every phase and trade involved in the work.

7. **Cutting & Patching** (Add to Article 47): The foregoing provisions are intended to cover alteration work, and do not nullify the Contractor's obligations to build-in or cast-in-place new work in accordance with good construction practices. The Contractor shall lay out in advance all such components so that cutting and patching is not necessary.

8. **Indemnification & Patents** (Add to the end of Article 36B): "and provided such instructions were a contracted obligation of the Architect".

   Modify Article 45 to indicate that the Contractor shall pay all applicable fees for use of, or employ properly franchised subcontractors for, any and all specified patented systems. Delete the last two sentences of Article 45.

9. Warranty (Add to Article 35A): The Contractor shall warrant to the Owner and Architect that all materials and equipment furnished is of good quality and new unless otherwise required or permitted, that the completed Work is free from defects and conforms with the requirements of the Contract. This warranty shall endure until voided by an applicable legal statute. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear.

   The warranties and guarantees required in the Printed General Conditions or elsewhere in the Contract Documents shall be in addition to, and not in limitation of, this or any other warranty or guarantee or remedy required under law or in the Contract Documents.

10. **Special Warranties** (Addition to Article 35D): The Contractor shall bind his subcontractors to the terms of any special warranty or guarantees as stipulated in various Sections of the technical specifications, and upon completion of the work, shall be deemed to have assumed the benefits granted, along with an obligation to underwrite and provide the said benefits to Owner. Unless expressly stated to the contrary, the term of all such special guarantees shall begin to run at substantial completion of the entire project or successful completion of the specific item, whichever is later; use of equipment or systems by the contractor shall not modify the guarantee period.

11. **Use of Site** (Article 46A): In the 4th line, add a period after the word "Work", and capitalize the next word "Use".

12. **Examination of Site** (Additions to Article 21): The Contractor and all sub-contractors will be held to have visited the site prior to bidding to ascertain local codes, existing conditions, grades, etc. No extra cost will be allowed because of Contractor's unfamiliarity with site or local conditions.

    Claims for unanticipated conditions will be considered only where such condition could not have been reasonably anticipated and could not have been noted in a thorough pre-bid walk-through inspection of the site. Such inspection should include observations above accessible ceilings but no cutting or excavation. Where inaccessible conditions might reasonably be any

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one of several characters, the Contractor will be held to having assumed the more difficult case.

13. **Claims for Delay** (Additions to Articles 22 and 23): The Contractor shall acknowledge that the construction process is not a smooth one, and that delays will be routinely encountered from adverse weather, actions of public officials, ambiguities, error and omissions in documents, review procedures, administration of the work, etc. The Contractor shall include in his bid a sufficient sum to account for extended overhead or other damage encountered as a result of such delay, and he shall waive his right to claim damage for delay resulting from these or similar causes.

    The waiver shall apply to claims for extended supervision, job and office overhead, escalation, labor inefficiency, and other causes. The waiver shall not apply to instances involving unjustified interferences, gross negligence, or unreasonable actions. Thus, while time extensions will be considered where resulting from routine delays beyond control of the Contractor, claims for overhead or other damage will not.

    The Contractor also agrees that this waiver shall preclude any action against the Owner or Architect to recover alleged damage resulting from good faith efforts of the Architect in the preparation of plans or administration of the work.

    While the foregoing (in itself) will not preclude a claim for increased cost of the specific and actual labor and material as might result from one of the circumstances identified, it shall not grant (extend or increase) to the Contractor any right of action that is not granted elsewhere in the documents.

    In his prosecution of the Work, the Contractor shall employ pacing delays, utilize float time, etc. to the best interest of the project, so as to cause no additional expense to the Owner, and so as to limit the impact of such delays on the final completion date. The foregoing provisions shall be included in all subcontracts.

14. **Delays Due to Weather** (Add to Article 23): All weather-related time extensions shall be for time only and are not compensable in any manner. Rainfall amounts must exceed two-tenths of an inch (0.20”) during the twenty-four-hour period includes to be considered a rain day for purposes of determining the number of actual rain days during the month. The five-year average for rain days per month shall be based on records at the National Weather Service office located nearest the construction site.

15. **Coordination** (Add to Article 16): The Contractor shall coordinate his activities, cooperate with and facilitate the activities of special inspectors employed for the project pursuant to Chapter 17 of the IBC.

D. SUBCONTRACTS (additions to Article 41 of General Conditions)

1. **Qualifications**: Employ only established, competent, experienced, financially sound subcontractors of good reputation, who have satisfactorily completed at least three equivalent projects, and who employ sub-subcontractors of like quality. Subcontractors who fail to meet these qualifications will be disqualified and shall be replaced at no increase in the contract sum. Recommendations for such disqualification will be made by the Architect, and the final determination will be made by the Director or Owner. Where such recommendations have been made and the Contractor advised, an NTP will not constitute approval of the list.

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Utilize the services of specialty subcontractors on those parts of the work which are specified to be performed by specialty subcontractors. Prebid approval of such specialty subcontractors may be established in the detailed Specifications where the nature of work involves highly specialized skills and/or the method of securing results rests heavily on the skill, experience or diligence of the subcontractor.

Should a sub become unable to continue because of death, bankruptcy, or other such unavoidable cause, the substitute sub must meet all qualifications required for the original sub (i.e. prebid approval, experience, geographic location, etc. as applicable).

Organization of the Specification into Divisions and Sections shall not control the Contractor in dividing the work except as it might lead to a diminished quality of workmanship or a division of responsibility.

2. **Contractor Forces**: Use by the Contractor of his own forces shall not waive any requirement that competent, experienced personnel be employed. In any operation at least the foreman and key personnel shall be knowledgeable, and the operation shall be one regularly performed by the Contractor with satisfactory results. Where subsequent paragraphs require use of a specialty contractor, the contractor will not be permitted to use his own forces.

3. **Payments by Contractor**: Neither the Owner nor the Architect will assume any obligation to insure payment to subcontractors, workmen, suppliers, etc. except as may otherwise be required by law.

4. **Familiarity with Documents**: Each subcontractor shall have a foreman or job manager who must read those portions of the Specifications (including Division One and all Addenda) applicable to his work. He must also have a copy of all approved shop drawings which involve his work. The project general superintendent shall require each such representative to initial and date the Contractor's job set as indication thereof.

5. **Sub-contractual Relations** (add to Par 41-B (1)): All such contracts shall specifically state that nothing in said contract shall create a contractual relationship with, or a cause of action in favor of, a third party against either the Owner or the Architect.

E. PAYMENTS TO CONTRACTOR (additions to Articles 29, 30, 31 & 34 of General Conditions)

1. **Schedule of Values**: Submit as indicated under Article 29 of General Conditions at least ten days prior to first Application for Payment. Use Table of Contents of this Specification as basis of format for sections under Divisions 2 through 16, with further breakdown for any sub-subcontract work, and for line items which exceed $30,000. Itemize separate line-item costs for guaranty bonds, insurance, field supervision and layout, laboratory fees, cash allowances, temporary facilities, clean-up, punch list team and warranty work. The Schedule of Values shall be submitted on AIA Form G703 or approved equal with each line item broken down between Labor and Materials. Revise and resubmit until approval is secured.

   Furnish on a separate list the exact amount of plumbing, HAC and electrical subcontracts without any mark-up by General Contractor.

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2. **Partial Payments**: No category of work will be judged as more than 95% complete until all items noted on the final inspection pertaining to that line have been satisfactorily resolved.

   Notice: Be aware that this project is a Public Works project in the State of Alabama. As such, the Owner cannot and will not pay advance deposits. Work must either be in place or meet the requirements set forth herein for stored materials before invoices for such work or materials can be paid.

3. **Architect's Certification**: Based on his observations at the site and on the Contractor's Applications for payment, the Architect will determine the amount owing to the Contractor and will issue Certificates for Payment in such amounts. The issuance of a Certificate shall constitute a representation by the Architect to the Owner, based on the Architect's observations at the site and on the data comprising the Application for Payment, that the Work has progressed to the point indicated, that to the best of the Architect's knowledge, information and belief, the quality of the Work for which payment is approved is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified (see Par 30-C).

4. **Stored Material** (Add to Article 29D): Material stored on-site will be assumed to be purchased, designated for the project, and its removal will be considered theft. Material stored off-site will be eligible for progress payment only if site conditions preclude its storage there. In addition such off-site material must represent a significant value, must be stored in a safe, protected area within a reasonable distance of the site, must be tagged for use on this job, must be insured, and must have proof of purchase.

5. **Final Payment** (Modification to Article 34): Unless the Architect or Owner is aware of outstanding claims against the Contractor, or unless the Surety shall require otherwise, the Contractor's Release of Claims from subs and suppliers (Item D3) may take the form of an affidavit that all outstanding indebtedness against the work has been paid or otherwise satisfied.

   The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and still unsettled.

6. **Advertisement of Completion** (See Article 34): Employ the standard copy recommended by the Alabama Division of Construction Management, which will be supplied upon request.

7. **Certification and Approvals for Payment** (Article 30-B): Modify as follow: Within 7 days after the Architect's regular scheduled site visit following receipt of the contractor' monthly Application for Payment, the Architect will take one of the following actions: (See General Conditions, Article 30-B for continuation).

F. TIME (Additions and Modifications to Articles 12, 23 and 49)

1. **Date of Commencement**: To be considered as the date established by the Notice to Proceed issued by the Alabama Division of Construction Management at which time the Contractor shall begin to schedule the work and assemble required submittals.

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2. **Completion Date**: The work must be substantially completed within **270 days** (Sundays and Holidays included) of the Date of Notice to Proceed. Substantial Completion of the Work, or designated portion thereof, is the date certified by the Architect, the Owner and the Division of Construction Management that construction is sufficiently complete to enable the Owner to occupy the facility for the intended use without encumbrance.

   The Contractor shall base his bid on the assumption that the full time allowed for construction will be required, and include adequate overhead, administrative and supervisory cost for not less than that period. No credit for unused cost will be requested by the Owner if completion is achieved earlier, but no increase in contract sum will be allowed for such costs if the Contractor schedules an earlier completion and subsequently claims delay for change order work or administrative delay.

3. **Extension of Time** (Add to Par 23 B3): Extensions on account of weather conditions will be considered only when such conditions were detrimental to progress and are in excess of the 5-year monthly average for that period and could not have been reasonably anticipated.

4. **Liquidated Damages**: See General Conditions, Article 49.

5. **Damages for Delay after Substantial Completion**: Pursuant to GC Par 32E, the Contractor will be allowed 30 calendar days to fully complete all punch list items. Justified exceptions will be granted upon written request. The Contractor shall bear all costs incurred by the Owner or Architect and resulting from the Contractor's failure to complete all punch list work within the allowed time and that cost will be deducted from the contract and paid to the affective parties.

6. **Progress Schedule** (See Article 12): The schedule shall be in the format recommended by the Director and shall reflect the anticipated cash flow which applications for payment will generate.

G. INSURANCE (additions to Article 37 General Conditions)

1. **General**: Attention is called to Title 39 of State Law which requires that “evidence” acceptable to the Awarding Authority that the specified insurance is in effect be presented before the Contract may be executed. Such “evidence” mandates properly completed certificates supplemented with attachments, checklists and/or statements which denote that all insurance requirements are being met.

   Nothing in this or other paragraphs of Contract Documents shall create or give to third parties any claim or right of action against the Contractor, the Owner or the Architect, beyond such as may legally exist irrespective of the Contract. Extent of coverage required, and the approval of the insurance carried shall not act to modify the liability of the Contractor, nor to imply that the limits and features described are adequate to protect the interests of the Contractor. In event of conflict with the General Conditions, the most stringent requirement shall apply. The Contractor by his execution of his contract shall waive his and his insurer’s right of subrogation against the Owner and Architect on all insurance provided by the Contractor and his subcontractors.

2. **Insurance Certificate** (Add to Article 37 A-4): Also include the telephone number of the Agency, names of any additional insureds, and the Best rating of the carriers.

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3. **Commercial General Liability** (Add to Article 37B-2): The policy shall be a current edition as has been approved by the State Insurance Department and shall be kept in force for at least two years after project acceptance.

   Coverage for owned and non-owned aircraft and watercraft shall be included if such are utilized in performance of the work. Include coverage for elevator, hoist and conveyor operations and sprinkler leakage.

4. **Umbrella Liability**: See General Conditions.

5. **Owner's Protective Liability Insurance**: Provide for the duration of the work in the name of the Owner, State Department of Education, Alabama Division of Construction Management and Architect, and their employees and agents, with minimum limits as noted. This policy shall provide primary coverage, be written on occurrence basis, and the Owner shall be first named. The policy shall continue in force to cover project related operations by or for the Contractor until the project is fully complete.

   BIPD $ 2,000,000 per occurrence, $3,000, 000 Aggregate Limit

   The policy shall be separate from the Commercial General Liability Policy (separate certificate) and shall contain no exclusion pertaining to job-related accidents (as might result from safety, construction sequences, workmanship or other causes). If demolition operations are involved in the project, no asbestos exclusions will be accepted. No pollution exclusions that might relate to roofing operations will be permitted. Submit a certified copy of the policy.

   If the insurance carrier has previously refused to honor their own policy in defense of one of the insureds named above, that carrier must attach satisfactory evidence of its intention to fulfill its obligation in good faith should a claim arise by attaching an endorsement which deems this contract as an "Insured Contract".

6. **Owner's Fire Insurance**: The Owner carries fire insurance with the State Insurance Fund and will continue to carry throughout the life of the contract, this insurance on the existing structure. The Contractor cannot be listed as an Additional Insured.

7. **Property (Builders Risk) Insurance** (Add to Article 37B-5): Coverage shall be stand-alone primary coverage policy and shall insure against fire with extended coverage for loss or damage including theft, vandalism, malicious mischief, collapse, surface water, backing up of sewers or drains, architect's service resulting from loss, debris removal resulting from loss and damage resulting from faulty workmanship. $10,000 maximum deductible. Named insureds must include the Owner, the Architect (and his engineering consultants), the Contractor and all subcontractors and sub-subcontractors, payable as their interests may appear for the duration of the work, and until transfer of coverage is established. Submit a certified copy of the policy for approval.

   The policy shall permit full or partial use or occupancy by the Owner prior to substantial completion. In such event, the Contractor shall notify Insurance Carrier and obtain a use and occupancy waiver; submit certificate of endorsement thereof. The policy cannot be conditioned on security lighting and fencing and shall not exclude coverage for loss resulting from malicious acts of employees of the Contractor or Subcontractors.

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8. **Subcontractors Insurance** (Add to Article 37C-2): Similar coverage is defined as being at least ½ of the limits specified for the General Contractor. The requirement to add parties as additional insureds is deleted.

H. PLANS AND SPECIFICATIONS (Add to Articles 2B, 2D, 4, 7, 13 & 41)

1. **Specifications**: The General and other Conditions and all other Contract Documents are applicable to all work under all Divisions of the Specifications. The Contractor shall verify that omissions or duplications are not caused by the arrangement of matter in the Contract Documents. Refer to key to abbreviations bound herein the Project Manual.

2. **Equipment and Material Substitutions** (Modify Article 13): Prebid approval is required for those products for which prebid approval is specifically indicated in the related Section of the specifications. Wherever the phrase “or equal” occurs, it shall be construed as meaning “equivalent” with comparisons made as set forth in Division One. Refer to Section 0160 for procedures to be followed.

3. **Construction Sets**: Contractor will be entitled to 20 sets of plans and specifications. These sets may be sets previously used by other contractors for bidding purposes and may contain minor marks on plans and/or specifications. Additional sets may be obtained for cost of printing. Keep one complete set on the job at all times.

I. SURETY BONDS (Modifications and Additions to Gen. Cond. 38)

1. **Surety**: Surety shall have a Best rating of A-minus or better and shall be identified by the U.S. Treasury as an approved surety with limits at least equal to the contract sum. Evidence of compliance shall be submitted with the bond. Equivalent financial capacity (i.e., reinsurance, etc.) will be considered but request for approval must be made in advance of bidding.

2. **Obligation to Surety**: Owner and Architect will assume no obligation to Surety regarding the performance of, or overpayments to, the Contractor (prior to default), but if advised in writing by Surety that a reasonable doubt exists regarding Contractor’s fulfillment of Contract and that payments should be withheld or reduced, the Owner and Architect will so comply.

End of Section

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Alabama Department of Finance
Real Property Management
Division of Construction Management
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Montgomery, AL 36104
(334) 242-4082, inspections@rpm.alabama.gov

DCM Form B-8
Revised February 2024

PRE-CONSTRUCTION CONFERENCE CHECKLIST

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

**Item shall be discussed while Owner is present.*

☐	*1. Name and relationship to job of local Owner personnel
☐	2. Public officials involved
☐	3. Names of architect/engineer personnel involved
☐	4. Provide e-mail addresses on Pre-Construction Sign-in sheet
☐	5. Construction sets of plans available to contractor
☐	6. Verify alternates accepted, etc.
☐	7. Approved list of sub-contractors
☐	8. Approved cost breakdown & Progress Schedule
☐	9. Method of approving monthly payment requests All State Agency, PSCA-funded University, and PSCA-funded K-12 projects: payment applications must be submitted via DocuSign PowerForm links available from DCM's website. Fully locally-funded University and fully locally-funded K-12 projects: submit payment applications per Owner requirements.
☐	10. Change Orders - Documentation - no prior work, **unless authorized in writing** All State Agency, public K-12, and PSCA-funded projects: change orders must be submitted via DocuSign PowerForm links available from DCM's website. Fully locally-funded University projects: submit change orders per Owner requirements.
☐	11. Shop drawings, time to process
☐	12. Advance notice for required inspections The contractor will notify the architect by email of the date the project will be ready for an inspection by the Division of Construction Management. Inspections must be requested 14 days in advance. When the DCM Inspector confirms the inspection date and time, the architect will send an email confirming the inspection date and time to all parties as well as a copy to inspections@rpm@rpm.alabama.gov. Cancellations of any scheduled inspection must be received in writing no later than 48 hours prior to the scheduled inspection. If the inspection is canceled, it will be rescheduled subject to the DCM Inspector's availability. Cancellations received less than 48 hours in advance shall incur a $1,500.00 re-inspection fee. If the contractor is not ready for the scheduled inspection he shall incur a $1,500.00 re-inspection fee.
☐	13. Inspection Minimum Requirements The following minimum requirements listed below are provided to aid the contractors and architect in determining if a project is ready for a required inspection. Pre-Construction Conference: Required Attendees: Contractor, Owner, Architect, Major Subs • Fully-executed construction contract and Notice to Proceed • Verification of permit fee payment (Exception: fully locally-funded K-12 & public four-year University capital improvement, HVAC, or roof projects with both an estimated cost of $750,000.00 or Less, and a contract awarded on or after 10/01/22, are exempt from DCM Fees.) • Owner's statement of responsibility (storm shelter) • Contractor's statement of responsibility and quality assurance plan (storm shelter) • Fire alarm contractor and fire sprinkler contractor certification (from State Fire Marshal) • ADEM permit, if more than one acre of land is disturbed

☐	13. Pre-Construction Conference for Storm Shelter: Required Attendees: Contractor, Owner, Architect, Structural Engineer, Major Subs, Special Inspections Representative • The completed & signed DCM Form B-15: Owner's Statement of Responsibility for Tornado Storm Shelter (Hurricane Shelter Where Applicable) must be submitted to the DCM Inspector at Pre-Construction Conference. • The completed & signed DCM Form C-17: Contractor's Statement of Responsibility for Construction of Tornado Storm Shelter (Hurricane Shelter Where Applicable) along with required Quality Assurance Plan (QAP) must be submitted to DCM Inspector at Pre-Construction Conference. Pre-Roofing Conference: Required Attendees: Contractor, Owner, Architect, Roofing Sub, Roofing Manufacturer's Representative • Roofing submittals must be approved by the architect prior to pre-roofing conference • Roofing manufacturer must provide documentation that roof design and roofing materials meet code requirements for wind uplift and impact resistance • Copy of sample roof warranty – Note: Standard manufacturer's roofing guarantees which contain language regarding the governing of the guarantee by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such guarantees. Above Ceiling Inspections: Required Attendees: Contractor, Owner, Architect, MEP Engineers, Major Subs • All work must be completed except for installation of ceiling tiles, and/or hard ceilings • Space must be conditioned • Permanent power must be connected unless otherwise arranged with the DCM Inspector • Grease duct must be inspected and approved by the DCM Inspector prior to fire wrapping and above-ceiling inspection Life Safety Inspections and Final Inspection: Required Attendees: Contractor, Owner, Architect, Engineers, Major Subs, Local Fire Marshal • Fire alarm certification • Kitchen hood fire suppression system certification • General contractor's 5-year roofing guarantee (DCM Form C-9) • Roofing manufacturer's warranty • Above ground and below ground sprinkler certifications • Completed certificate of structural engineer's observations (for storm shelter) • Emergency and exit lighting tests • Fire alarm must be monitored • Elevator inspection completed and certificate of operation provided by the State of Alabama Department of Labor • Boiler/vessels inspection completed and certificate of operation provided by the State of Alabama Department of Labor • Pressure test/Flush test for underground sprinkler lines (witnessed by local fire marshal, fire chief and/or DCM Inspector) • Flush/pressure test for new and/or existing fire hydrants • Must have clear egress/access and emergency (for first responders) access to building • Must have ADA access completed 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. Routine job cleanup
☐	27. O.S.H.A. - Report all accidents - safety General Contractor's responsibility
☐	28. Contractor is reminded of obligation to comply with the Alabama Child Labor Law and E-verify
☐	29. Project limits
☐	30. Building location relative to critical property line, easement, setback, etc.
☐	31. Locating property line, corners, etc.
☐	32. Verify sanitary outfall before committing floor level
☐	33. ADEM land disturbance permits shall be required if site is over 1-acre.
☐	34. Procedure if bad soil or rock is encountered: Geotech and special inspections
☐	35. Stockpiling topsoil
☐	36. Protecting trees
☐	37. Soil compaction, type soil, lab tests, etc.
☐	38. Soil Treatment, mix on site in presence of Job Superintendent
☐	39. Surveyor to check foundation wall if location critical
☐	40. Ready mix plant, file delivery tickets, slump tests, cylinders
☐	41. Quality of concrete work; concrete testing
☐	42. Inspections before pouring concrete
☐	43. What is expected of masonry work, mortar additive
☐	44. Problems with hollow metal - install proper fire labels
☐	45. Pre-roofing Conference - no roofing materials installed prior to conference, all roofing submittals and warranties must have been reviewed and approved by the Architect prior to the Pre-roofing Conference. Manufacturer's Representative must be present at Pre-roofing conference. The Roofing Manufacturer must show compliance with the IBC wind and impact-resistance requirements. Contractor shall video existing building interior and exterior prior to roofing operations and provide copy to Owner.
☐	46. General Contractor's Roofing Guarantee and Manufacturer's Roofing Warrantees must be presented to DCM Inspector at Final Inspection and submitted with Certificate of Substantial Completion for all projects via DocuSign PowerForm links available from DCM's website.
☐	47. Potential conflict of mechanical and electrical equipment; shop drawings
☐	48. Return air plenums (no combustibles)
☐	49. Fire damper installation issues
☐	50. Certificate of Substantial Completion/Final Inspection All projects: Certificate must be activated via DocuSign PowerForm links after final inspection and receipt of DCM Inspector's report. DocuSign PowerForm links are available from DCM's website.
☐	51. Conduct of contractor's personnel. No interaction with staff and/or students. No foul language, no smoking or use of tobacco products, no drugs and no firearms on school property.

☐	52. Elevators/Pressure Vessels must be inspected and approved by the State of AL Dept. of Labor prior to final inspection.
☐	53. Life safety, fire alarm, sprinkler and kitchen hood fire suppression systems must be complete and certified prior to final Inspection. Also, exit and emergency lighting must be complete.
☐	54. Comply with ADA requirements: plumbing fixture heights, toilet partition widths, turnaround, signage, parking lot striping, etc.
☐	55. Coordinate with local fire authority to assure access to the building for firefighting equipment during construction and before final acceptance. Provide fire extinguishers as required.
☐	56. Light gauge metal roof framing and/or wood truss framing to be inspected by the structural engineer.
☐	57. Comply with fire hydrant requirement; coordinate with local Fire Authority or State Fire Marshal.
☐	58. Craft-faced insulation is not to be installed exposed.
☐	59. Fire alarm contractor and fire sprinkler contractor must be permitted through the State of Alabama Fire Marshal's Office. Provide permits.
☐	60. All sprinkler system valves must be electrically supervised
☐	*61. Fire alarm monitoring requirements
☐	62. Storm Shelter requirements a. Contractor's Statement of Responsibility and Quality Assurance Plan – Provide paperwork at Pre-Construction Conference. Must be kept with Owner's storm shelter records. b. Certification of Structural Observations from the Structural Engineer of Record must be attached to the Certificate of Substantial Completion form via DocuSign. c. Owner's Statement of Responsibility for Tornado Storm Shelter (Hurricane Shelter Where Applicable) - Provide paperwork at Pre-Construction Conference. Must be kept with Owner's storm shelter records.
☐	63. Third-party inspections/special inspections
☐	64. Release of retainage – 30 days to complete punch list and closeout
☐	*65. Sales tax savings (Alabama Department of Revenue)
☐	66. Project Closeout - precedes Final Payment 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 $100,000.00, Advertisement of Completion is not required. b. for projects $100,000.00 or more, Contractor advertises for 3 weeks. The contractor can publish a notice in one or more of the following ways: • In a newspaper of general circulation in the county or counties in which the work, or some portion thereof, has been done. • On a website that is maintained by a newspaper of general circulation in the county or counties in which the work, or some portion thereof, has been done. • On a website utilized by the awarding authority for publishing notices. • If no newspaper is published in the county in which the work was done, and if the awarding authority does not utilize a website for the purpose of publishing notices, the notice may be given by posting at the courthouse for 30 days, and proof of the posting of the notice shall be given by the awarding authority and the contractor.
☐	68. Time Extensions
☐	69. Final Payment Application checklist

TO: **Alabama Department of Finance**
Real Property Management
Division of Construction Management
770 Washington Avenue, Suite 444
Montgomery, AL 36104
(334) 242-4082, inspections@realproperty.alabama.gov

This form does not need to be submitted to DCM. It is for your office use and the Contractor's office use, if needed.

DCM Form B-9
August 2021

PROJECT DATA FORM

Date: _____

DCM (BC) No. _____

PROJECT (NAME AND LOCATION)	OWNER (FULL ENTITY NAME, ADDRESS, & PHONE No.)
CONTRACTOR (FULL CO. NAME, ADDRESS, & PHONE No.)	ARCHITECT/ENGINEER (FIRM NAME, ADDRESS, & PHONE No.)

FUNDING SOURCE:
☐ **PSCA** ☐ **LOCAL** ☐ **STATE** ☐ **OTHER** _____

CONTRACT AMOUNT: $
Alternates Included in Contract:

CONTRACT TIME	Date Bids Rec'd:	Date of Contract:
Work Start Date:	Time Limit:	Scheduled Completion Date:

BONDS and INSURANCE
Performance Bond By:
Payment Bond By:
Builder's Risk By:
Workman's Compensation By:
Liability By:

****PRECONSTRUCTION CONFERENCE NOTE****

Please contact the appropriate DCM Inspector for this project by telephone or email at least fourteen (14) days prior to scheduling the Pre-Construction Conference. Inspector territories and email addresses are on the Staff webpage of www.dcm.alabama.gov.

	Len Kirk - (334) 850-2067		**Chandler Gann - (334) 320-1844**
	Paul Gray - (256) 248-5202		**David Roberson - (256) 299-0517**
	Corey Odom - (334) 320-1721		**Steve Pendley - (251) 331-2319**
	Don Williams - (256) 248-5147		

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Form B-10

TO: Alabama Department of Finance
Real Property Management
Division of Construction Management

770 Washington Avenue, Suite 444
Montgomery, Alabama 36104
(334) 242-4082 (p) inspections@realproperty.alabama.gov

STATEMENT OF FIELD OBSERVATIONS

Date:

DCM#:	**A/E#:**	**PSCA#:**
PROJECT NAME AND LOCATION:		**OWNER ENTITY NAME & ADDRESS:** **Phone No.:**
CONTRACTOR COMPANY NAME & ADDRESS: **Phone No.:**		**ARCHITECT/ENGINEER FIRM NAME & ADDRESS:** PH&J Architects, Inc. 807 South McDonough Street Montgomery, AL 36104 **Phone No.:** 334.265.8781

PROJECT DATA ON THE DATE OF OBSERVATION:

Site Conditions:		No. of Workers:	
Starting Date:		Weather:	
Scheduled State of Completion:	0%	Contract Completion Date:	
Contractor's Superintendent:		Estimated Actual Completion:	0%
		Job Phone #:	

COMMENTS/DEFICIENCIES:

Signature _____ **Report No.** _____

cc: Owner, Architect/Engineer, Contractor, DCM Office (inspections@realproperty.alabama.gov)**, DCM Inspector**

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GENERAL CONTRACTOR'S ROOFING GUARANTEE

DCM Project No. _____

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

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

1. The General Contractor does hereby certify that the roofing work included in this contract was installed in strict accordance with all requirements of the plans and specifications and in accordance with approved roofing manufacturers recommendations.

2. The General Contractor does hereby guarantee the roofing and associated work including but not limited to all flashing and counter flashing both composition and metal, roof decking and/or sheathing; all materials used as a roof substrate or insulation over which roof is applied; promenade decks or any other work on the surface of the roof; metal work; gravel stops and roof expansion joints to be absolutely watertight and free from all leaks, due to faulty or defective materials and workmanship for a period of five (5) years, starting on the date of substantial completion of the project. This guarantee does not include liability for damage to interior contents of building due to roof leaks, nor does it extend to any deficiency which was caused by the failure of work which the general contractor did not damage or did not accomplish or was not charged to accomplish.

3. Subject to the terms and conditions listed below, the General Contractor also guarantees that during the Guarantee Period he will, at his own cost and expense, make or cause to be made such repairs to, or replacements of said work, in accordance with the roofing manufacturers standards as are necessary to correct faulty and defective work and/or materials which may develop in the work including, but not limited to: blisters, delamination, exposed felts, ridges, wrinkles, splits, warped insulation and/or loose flashings, etc. in a manner pursuant to the total anticipated life of the roofing system and the best standards applicable to the particular roof type in value and in accordance with construction documents as are necessary to maintain said work in satisfactory condition, and further, to respond on or within three (3) calendar days upon proper notification or leaks or defects by the Owner or Architect.

A. Specifically excluded from this Guarantee are damages to the work, other parts of the building and building contents caused by: (1) lightning, windstorm, hailstorm and other unusual phenomena of the elements; and (2) fire. When the work has been damaged by any of the foregoing causes, the Guarantee shall be null and void until such damage has been repaired by the General Contractor, and until the cost and expense thereof has been paid by the Owner or by the responsible party so designated.

B. During the Guarantee Period, if the Owner allows alteration of the work by anyone other than the General Contractor, including cutting, patching and maintenance in connection with penetrations, and positioning of anything on the roof, this Guarantee shall become null and void upon the date of said alterations. If the owner engages the General Contractor to perform said alterations, the Guarantee shall not become null and void, unless the General Contractor, prior to proceeding with the said work, shall have notified the Owner in writing, showing reasonable cause for claim that said alterations would likely damage or deteriorate the work, thereby reasonably justifying a termination of this Guarantee.

C. Future building additions will not void this guarantee, except for that portion of the future addition that might affect the work under this contract at the point of connection of the roof areas, and any damage caused by such addition. If this contract is for roofing of an addition to an existing building, then this guarantee covers the work involved at the point of connection with the existing roof.

D. During the Guarantee period, if the original use of the roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray cooled surface, flooded basin, or other use of service more severe than originally specified, this Guarantee shall become null and void upon the date of said change.

E. The Owner shall promptly notify the General Contractor of observed, known or suspected leaks, defects or deterioration, and shall afford reasonable opportunity for the General Contractor to inspect the work, and to examine the evidence of such leaks, defects or deterioration.

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

_____
General Contractor's Authorized Signature

_____
Typed Name and Title

DCM Form C-10
Revised July 2022

DCM (BC) No. _____

PSCA Projects: PSCA No. _____

Application No. _____

Date: _____

APPLICATION and CERTIFICATE for PAYMENT

Attach DCM Form C-10SOV: Schedule of Values

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

A. Total Original Contract	$
B. Fully Executed (fully signed) Change Order(s) Numbers __ through __	+$ _____
C. Total Contract To Date	$

1. Work Completed to Date per attached Schedule of Values *(Form C-10SOV's Column F Total)*		$
2. Materials Presently Stored *(When this amount is greater than $0.00, attach Form C-10SM: Inventory of Stored Materials, or similar list)*		+$ _____
3. Total Work Completed to Date & Materials Presently Stored *(_____% of Contract To Date)*		$
4. Less Retainage *(If Total Work Completed to Date & Materials Presently Stored (#3) is less than or equal to 50% of Total Contract to Date (C), Retainage = #3 x 0.05. Once #3 exceeds 50% of C and up until project is complete, Retainage = C x 0.025. $0 is retained on final payment application, see last bullet point below Instructions.)*	Final pay app? ☐ Yes.	−$ _____
5. Total Due		$
6. Less Total Previous Payments Billed *(Must exactly match #5 Total Due from previous payment application. # 6 is $0.00 if there is no previous payment application)*		−$ _____
7. Balance Due This Estimate		$

CONTRACTOR'S CERTIFICATION

The undersigned Contractor certifies that to the best of his knowledge, information, and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by him for Work for which previous Certificates for Payments were issued and payments received from the Owner and that current payment shown herein has not yet been received.

By: _____ Date: _____
Contractor's Signature

Name & Title _____

Sworn and subscribed before me this _____ day of _____
Day Month, Year

Seal:

_____
Notary Public's Signature

ARCHITECT'S / ENGINEER'S CERTIFICATION

In accordance with the Contract Documents, the Architect/ Engineer certifies to the Owner that, to the best of the Architect's/ Engineer's knowledge and belief, the Work has progressed to the point indicated herein, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the amount approved.

By _____
Architect's / Engineer's Signature

Name & Title _____

Date _____

INSTRUCTIONS

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

APPROVAL

_____
Owner Entity

By _____
Signature

Name & Title _____

Date _____

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SCHEDULE OF VALUES (SOV)

DCM Form C-10SOV
Revised October 2021

Project:	DCM (BC) Project Number:
	PSCA Project Number, if any:
Contractor Company:	Application Number:
	Application Date:
	Period From: / Period To:

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

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

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INVENTORY OF STORED MATERIALS

DCM Form C-10SM
Revised October 2021

Project:	DCM (BC) No.:
	PSCA No, if any:
Contractor Company:	For Estimate No.:
	For Period Ending:

A	B	C	D	E
Description	**Materials Stored Last Period**	**Materials Purchased This Period (period noted above)**	**Materials Used This Period (period noted above)**	**Materials Presently Stored (B + C - D)**
TOTALS:				

Instructions :

· This Form C-10SM must be submitted as part of the payment application documentation when a Materials Presently Stored amount of anything greater than $0 is noted on line 2 of DCM Form C-10: Application and Certificate for Payment.

· Receipts must be provided as attachments to this form C-10SM for all amounts placed in Column C: Materials Purchased This Period.

· The total $ amount of this Form C-10SM's column E: Materials Presently Stored must match both Form C-10's line 2: Materials Presently Stored, and Form C-10SOV: Schedule of Values' total $ amount of Column G: Materials Presently Stored.

· The $ amounts in this current Form C-10SM's Column D: Materials Used This Period are amounts that must all be included in the current payment application's Form C-10SOV's Column E: Work Completed This Period.

· The $ amounts in this current Form C-10SM's Column E: Materials Presently Stored are the amounts that must be listed in the next payment application's Form C-10SM's Column B: Materials Stored Last Period.

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

	WORK DIVISION	%	AMOUNT													
1.	GENERAL REQUIREMENTS															
2.	SITEWORK															
3.	CONCRETE															
4.	MASONRY															
5.	METALS															
6.	WOOD AND PLASTIC															100%
7.	THERMAL AND MOISTURE PROTECTION															90%
8.	DOORS AND WINDOWS															80%
9.	FINISHES															70%
10.	SPECIALTIES															60%
11.	EQUIPMENT															50%
12.	FURNISHINGS															40%
13.	SPECIAL CONSTRUCTION															30%
14.	CONVEYING SYSTEMS															20%
15.	MECHANICAL															10%
16.	ELECTRICAL															0%
TOTAL ORIG. CONTRACT		100%														
ANTICIPATED DRAW IN $1,000																
ACTUAL DRAW IN $1,000																

LEGEND: ANTICIPATED ACTIVITY ACTUAL ACTIVITY ANTICIPATED CASH FLOW ACTUAL CASH FLOW

USE ADDITIONAL SHEETS IF JOB IS SCHEDULED OVER 12 MONTHS.

DCM Form C-11 August 2021

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CONTRACT CHANGE ORDER

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

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

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

_____.

FURNISH the necessary labor, materials, and equipment to (*Description of work to be done or changes to be made. If the description is continued in an attachment, identify the attachment below*):

Description continued from Page 1:

ORIGINAL CONTRACT SUM $ _____

NET TOTAL OF PREVIOUS CHANGE ORDERS $ _____

PREVIOUS REVISED CONTRACT SUM $ _____

This change order will ☐ increase ☐ decrease the contract sum by $ _____

REVISED CONTRACT SUM, INCLUDING THIS CHANGE ORDER $ _____

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

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

APPROVALS

By _____ Date: _____
Governor (State Agency projects except ABRFA, AIDB & USSRC)

By _____
Secretary of State (Conservation projects only)

By _____
Add'l Agency, Title:

_____
Architectural/Engineering Firm

Recommended By _____
Signature

Name & Title _____

ALABAMA DEPARTMENT OF FINANCE, REAL PROPERTY MANAGEMENT (RPM), DIVISION OF CONSTRUCTION MANAGEMENT (DCM)

By _____
Finance Director (Finance, sub-Finance & ABRFA projects only)

By _____
RPM Director (Finance, sub-Finance & ABRFA projects only)

By _____
DCM Director (all State Agency projects)

Reviewed By _____
DCM Contract Administrator (all State Agency projects)

CONTRACTING PARTIES

_____
Contractor Company

By _____
Signature

Name & Title _____

_____
Owner Entity

By _____
Signature

Name & Title _____

Additional Owner Entity signature space if needed:

_____
Owner Entity

By _____
Signature

Name & Title _____

The Awarding Authority/Owner certifies that funds are available in the amount required for this Change Order.

CONSENT OF SURETY (for additive $ change orders only)

_____
Surety Company

By _____
Signature (Attach current Power of Attorney)

Name & Title _____

Review/Signature flow: Architect/Engineer (prepare documents) > Contractor (review and sign) (> Surety for additive $ changes only [sign]) > Architect/Engineer (review and sign) > Owner (review and sign) > RPM/DCM (review and sign) > Finance-Legal (> Finance, Finance sub-Agencies & Alabama Building Renovation Finance Authority [ABRFA] projects then go to Finance Director [review and sign]) > Governor (review and sign) (> Conservation projects then go to Secretary of State [review and sign]) > DCM (distribute fully executed Change Order to all parties). Note: Transportation inserts an additional signature sheet.

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

CHANGE ORDER JUSTIFICATION

Purpose and instructions on next page.
Do not staple this form and/or attachments; use clips.

Change Order No. _____

Date: _____

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):** **ATTACH CONTRACTOR'S DETAILED COST PROPOSAL(s)**

AMOUNT: ☐ **ADD** ☐ **DEDUCT $_____** **TIME EXTENSION: _____ CALENDAR DAYS**

(C)

ORIGINAL CONTRACT AMOUNT		PREVIOUS C.O.'s _____ THRU _____		CONTRACT AMOUNT PRIOR TO PROPOSED CHANGE ORDER
$_____	+	$_____	=	$_____

(D) **JUSTIFICATION FOR NEED OF CHANGE(S):**

(E) **JUSTIFICATION OF CHANGE ORDER vs. COMPETITIVE BID:**

(F) **ARCHITECT / ENGINEER'S EVALUATION OF PROPOSED COST:**

(G)

CHANGE ORDER RECOMMENDED	CHANGE ORDER JUSTIFIED AND APPROVED
_____ ARCHITECTURAL / ENGINEERING FIRM NAME	_____ LOCAL OWNER ENTITY NAME
By: _____ ARCHITECT / ENGINEER'S SIGNATURE	By: _____ OWNER'S SIGNATURE
By: _____ OWNER'S PROJECT REPRESENTATIVE'S SIGNATURE	By: _____ OWNER'S LEGAL COUNSEL'S SIGNATURE

CHANGE ORDER JUSTIFICATION: PURPOSE and INSTRUCTIONS

PURPOSE

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

I. Minor Changes for a monetary value less than required for competitive bidding.

II. Changes for matters relatively minor and incidental to the original contract necessitated by unforeseeable circumstances arising during the course of the work.

III. Emergencies arising during the course of the work of the contract.

IV. Bid alternates provided for in the original bidding where there is no difference in price of the change order from the original best bid on the alternate.

V. Changes of relatively minor items not contemplated when the plans and specifications were prepared and the project was bid which are in the public interest and which do not exceed 10% of the contract price.

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

INSTRUCTIONS

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

1. Insert the proposed Change Order Number, date of the Justification, and DCM (BC) Project Number in the spaces provided in the upper right-hand corner.

2. **Section (A):** Insert the complete name and address of the PROJECT, OWNER, CONTRACTOR, AND ARCHITECT/ENGINEER.

3. **Section (B)**: Provide a complete description of the proposed changes in work, referring to and attaching revised specifications and/or drawings as appropriate. An attachment may be used if additional space is needed, but insert the proposed amount and time extension of the change(s) in the spaces provided. **Attached a copy of the contractor's detailed cost proposal.**

4. **Section (C**): Insert the Original Contract amount, the net increase or decrease of previous Change Orders, and the Current Contract amount (preceding the currently proposed Change Order).

5. **Section (D):** Explain why it is necessary, or in the public's interest, to make the proposed change(s) to the Work.

6. **Section (E)**: Explain why award of the changed work to the existing contractor instead of awarding the work under the competitive bid process is justified.

7. **Section (F)**: The design professional must state his evaluation of the reasonableness and fairness of the proposed costs based upon his review of the contractor's proposal.

8. **Section (G)**: The design professional must recommend the Change Order to the Owner by signing the document; the Owner may require such recommendation from other individuals. The Owner must sign the document indicating that they believe change order action in lieu of the competitive bid process is justified for the proposed change(s). **Review of the matter and signing of the document by the Owner's legal counsel is highly recommended. If the cumulative change order amount exceeds 10% of the original contract amount then the Owner's legal consultant must sign the Change Order Justification prior to submission to DCM.**

Alabama Department of Finance
Real Property Management
Division of Construction Management
770 Washington Avenue, Suite 444
Montgomery, Alabama 36104
(334) 242-4082 (phone)

DCM Form B-12
Revised July 2022

CHANGE ORDER CHECKLIST

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

WHICH FORM DO YOU USE?

Use **DCM Form C-12** for contracts of state agencies and departments and State Department of Education (SDE) projects. Also use for ACCS projects with Notice-to-Proceeds issued prior to August 1, 2021.
Use **DCM Form 9-J** for contracts of projects partially or fully Public School and College Authority (PSCA)-funded, except for ACCS projects with Notice-To-Proceeds issued after July 31, 2021. Include a completed **DCM Form B-11:** Change Order Justification with each copy of either DCM Forms C-12 or 9-J.

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

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

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ALLOWANCE AUTHORIZATION FORM

Project Name:

Name of Allowance Account: **Owner's Allowance**

Authorization No.: **x** Date: **x**

In accordance with Specification Section 0101 - "BASE BID, ALTERNATES & ALLOWANCES", the Contractor, **x,** is hereby authorized to proceed with the changes in Work as are described below and is to be paid for the performance of these changes as provided in Specification Section 0101. This Authorization shall become effective when it is signed by the Contractor and the Owner's Representative, and it is understood and agreed that the amount(s) stipulated below constitute full compensation for these changes in Work.

Description of the Work under this Authorization: **(See Attached)**
(Attach sufficient backup to justify cost)

Total amount of this Authorization:	$0.00

Original amount of the **Owner's** Allowance:	$0.00
Net total of Previous Authorizations:	$0.00
Previous Remaining **Owner's** Allowance:	$0.00
Total amount of this Authorization:	$0.00
Owner's Allowance Remaining after this Authorization	$0.00

Recommended by:	Authorized by:	Accepted by:
ARCHITECT	STATE AGENCY	CONTRACTOR

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

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

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

CERTIFICATE OF SUBSTANTIAL COMPLETION

ROUTING PROCEDURES *ON NEXT PAGE*

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 entire Work ☐ the following portion of the Work:

_____

_____.

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

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

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

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

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

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

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

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

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

NOTICE

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

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

SAMPLE FORM OF ADVERTISEMENT FOR COMPLETION

LEGAL NOTICE

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

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

at _____

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

_____

_____
(*Architect / Engineer*)

_____
(Contractor)

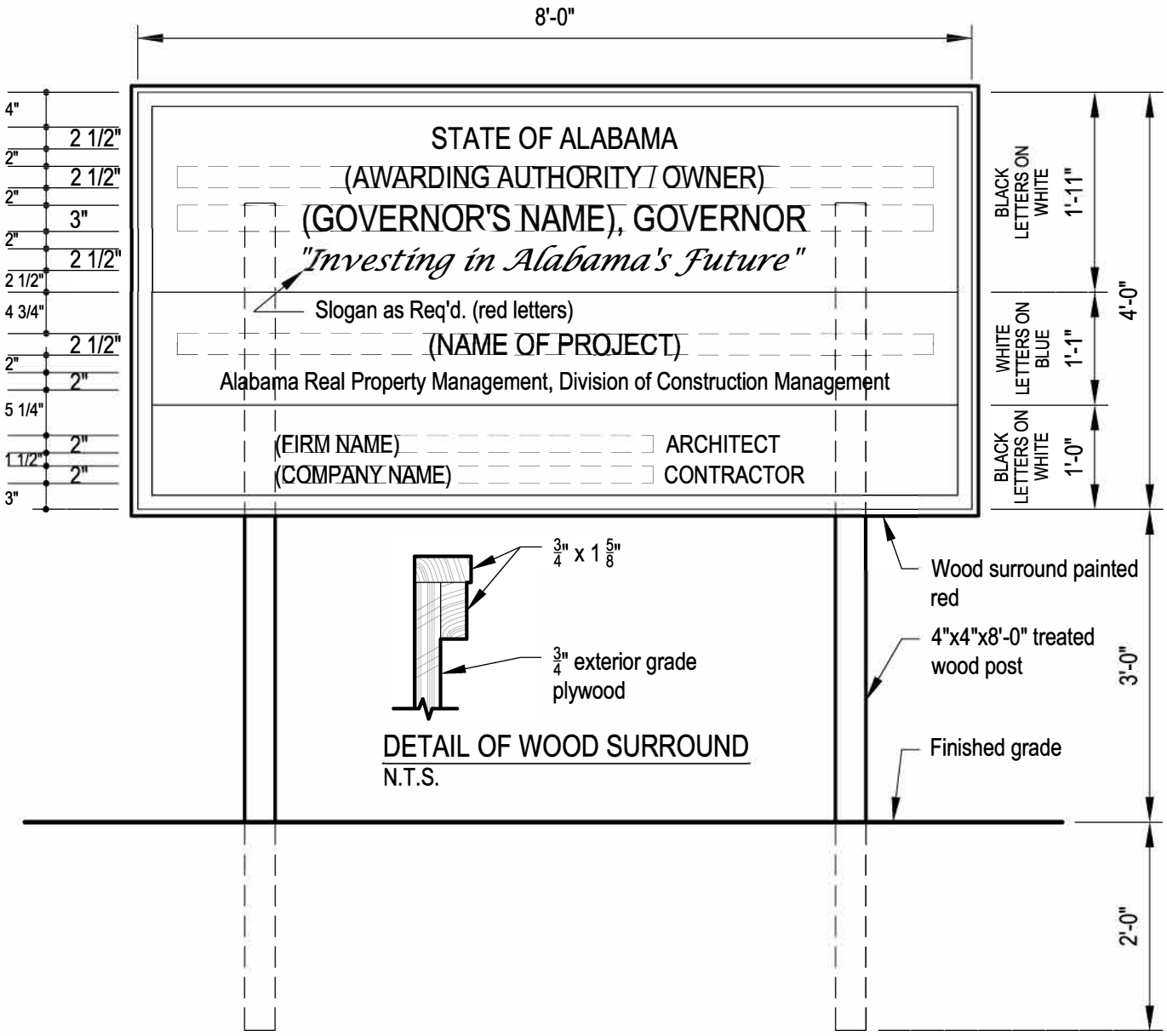
_____
(Business Address)

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

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DETAIL OF PROJECT SIGN

N.T.S.



DETAIL OF WOOD SURROUND

N.T.S.

Notes:

1. Fully locally-funded State Agency and Public University projects: DCM Form C-15 must be included in the project manual regardless of expected bid amount. If the awarded contract sum is $100,000.00 or more, Contractor shall furnish and erect a project sign.
   Fully locally-funded K-12 school projects: Project sign is not required unless requested by Owner, if project sign is requested by Owner, include DCM Form C-15 in the project manual.
   Partially or fully PSCA-funded projects: DCM Form C-15 must be included in the project manual. Contractor shall furnish and erect a project sign for all PSCA-funded projects, regardless of contract sum. "Alabama Public School and College Authority " as well as the local owner entity must be included as awarding authorities on the project sign of all PSCA-funded projects. Exception: Alabama Community College System (ACCS) PSCA-funded projects with Notice-To-Proceeds issued after July 31, 2021 are not submitted to DCM.
   Fully locally-funded ACCS projects with Notice-To-Proceeds issued prior to August 1, 2021: DCM Form C-15 must be included in the project manual regardless of expected bid amount. If the awarded contract sum is $100,000.00 or more, Contractor shall furnish and erect a project sign.
2. Sign to be constructed of ¾" 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.

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2004-165

STATE OF ALABAMA
OFFICE OF THE ATTORNEY GENERAL

TROY KING
ATTORNEY GENERAL

ALABAMA STATE HOUSE
11 SOUTH UNION STREET
MONTGOMERY, AL 36130
(334) 242-7300
WWW.AGO.STATE.AL.US

June 23, 2004

Honorable Evan K. Major, Jr.
Superintendent
Shelby County Schools
410 East College Street
Post Office Box 1910
Columbia, Alabama 35051-1910

Building Permits – Schools – Projects

The Shelby County Board of Education ("Board") is only required to comply with the building code of the Alabama Building Commission ("Building Commission"), not local building codes. Board projects are subject to review and inspection only by the Building Commission, not by local governments. The Board is not required to pay for local permits.

Dear Superintendent Major:

This opinion of the Attorney General is issued to your request on behalf of the Shelby County Schools.

QUESTIONS

(a) Do county school systems, which are state entities, have to pay for building permits for building projects?

(b) Because county school systems projects are reviewed and inspected by the State of Alabama Building Commission, are projects subject to review and inspection by local and county agencies?

(c) Because municipalities and counties have adopted various editions of building codes and building projects that are reviewed by the Alabama State Building Commission, are these

projects subject to other codes than those adopted by the Building Commission?

FACTS AND ANALYSIS

Local city and county agencies are directly responsible for overseeing building projects in each of their respective jurisdictions. Permitting, review, and inspections are directly performed by these entities for building and construction projects by these agencies. Local and county school systems perform various building and construction projects and, as such, submit their projects to the State Building Commission for review and approval, but the projects are conducted physically in the area normally recognized as falling in the jurisdiction of either the county or local regulations. The inspectors of the county or city agencies sometimes require school systems to be subject to their licensing and inspection regulations. Further, the local jurisdiction has frequently adopted building codes.

"Local governments do not possess the statutory authority to tax the state or its agencies. Therefore, local governments do not possess the statutory authority to charge [an agency of the state] permit or inspection fees." Opinion to Honorable R.G. Britton, Commissioner, Board of Corrections, dated January 6, 1981, A.G. No. 81-00165. County boards of education are not agencies of the counties, but local agencies of the state, charged by the Legislature with the task of supervising public education within counties. *Bd. of School Comm'rs of Mobile County v Architects Group, Inc.*, 752 So. 2d 489 (Ala. 1999). The *Britton* opinion also held that, when a state officer or employee is acting within the scope of his or her authority and on behalf of the state agency, a local government's licensing requirements are not applicable. A.G. No. 81-00165 at 3; *see also* opinion to Honorable James W. Warr, Director, Department of Environmental Management, dated January 14, 2002, A.G. No. 2002-119.

"The code of minimum building standards promulgated and enforced by the Building Commission shall be applicable only to all state buildings and construction, schoolhouses . . . ." ALA. CODE § 41-9-162(a) (2000). "State building and construction" is defined as "[a]ll buildings and other structures erected or acquired by or in behalf of the State of Alabama or any of its agencies or instrumentalities." ALA. CODE § 41-9-160(1) (2000). "Schoolhouse" is defined as "[a]ny building or other structure erected or acquired by the public schools of Alabama . . . ." ALA. CODE § 41-9-160(2) (2000). Furthermore, "[n]o county or municipality shall apply [its] building code to state buildings and construction of public schoolhouses." ALA. CODE § 41-9-166 (2000).

Municipalities and counties may exercise only the authority given to them by the Legislature. *Jefferson County v. Johnson*, 333 So. 2d 143, 145 (Ala. 1976) & *Arrington v. Associated Gen. Contractors of America*, 403 So. 2d 893, 902 (Ala. 1981), *cert. denied*, 455 U.S. 913 (1982). The Legislature has expressly granted them authority to enforce only their own building codes. ALA. CODE § 11-43-59 (1989); ALA. CODE § 34-14A-12 (2002). Authority to enforce the state building code lies exclusively with the Building Commission. ALA. CODE § 41-9-165 (2000).

To the extent that the opinion to Arnold W. Umbach, Jr., Opelika City Attorney, dated September 27, 1989, A.G. No. 89-00446, holds that state agencies must comply with local building codes, it is hereby overruled. Likewise, to the extent that the *Britton* opinion holds that local governments can inspect and regulate construction by state agencies to ensure compliance with the state building code, it is hereby overruled.

CONCLUSION

The Shelby County Board of Education is only required to comply with the building code of the Alabama Building Commission, not local building codes. Board projects are subject to review and inspection only by the Building Commission, not by local governments. The Board is not required to pay for local permits.

I hope this opinion answers your questions. If this Office can be of further assistance, please contact Ward Beeson of my staff.

Sincerely,

TROY KING
Attorney General
By:



CAROL JEAN SMITH
Chief, Opinions Division

TK/GWB
141196v4/59220

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DCM (BC) Number: _____

PSCA Projects: PSCA Number: _____

Date of the Construction Contract: _____

Contractor's Affidavit of Payment of Debts and Claims

To Owner (*Entity name and address*)**:**	**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:

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DCM (BC) Number: _____

PSCA Projects: PSCA Number: _____

Date of the Construction Contract: _____

Contractor's Affidavit of Release of Liens

To Owner (*Entity name and address*)**:**	**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:

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DCM (BC) Number: _____

PSCA Projects: PSCA Number: _____

Date of the Construction Contract: _____

Surety's Bond Number: _____

CONSENT OF SURETY TO FINAL PAYMENT

To Owner (*Entity name and address):*	**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:

_____ Seal:
Company Name

By _____
Signature of Authorized Representative

_____
Printed Name and Title

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

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FINAL PAYMENT CHECKLIST (FPC)

To be completed by the Architect/Engineer and submitted to DCM for review; applicable only to state agencies, partially or fully PSCA-funded and other bond-funded projects (exception: Alabama Community College System (ACCS) PSCA-funded projects with Notice-To-Proceeds issued after July 31, 2021). Two copies of the FPC are required. Each copy of the FPC shall include all attachments including the Contractor's Application for Final Payment. If all PSCA funds are expended prior to Final Payment, it is not a requirement to submit the Application & Certificate for Final Payment along with the supporting documentation to DCM.

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

PROJECT:	**DCM (BC) No.** _____ **PSCA No.** _____ (If applicable)

YES	N/A	Select "YES" or "N/A" as applicable.
☐	☐	Application and Certificate for Final Payment, DCM Form C-10: Attach one copy to FPC. The application must include original signatures of all parties and include all application attachments.
☐		Certificate of Substantial Completion, DCM Form C-13: Attach one fully-executed copy to FPC.
☐		Advertisement for Completion, DCM Form C-14: Attach one copy of the affidavit of publication (including the advertisement) to the FPC.
☐	☐	Contractor's Affidavit of Payment of Debts & Claims, DCM Form C-18: Attach one copy to FPC.
☐	☐	Contractor's Affidavit of Release of Liens, if required by Owner, DCM Form C-19: Attach one copy to the FPC.
☐	☐	Consent of Surety to Final Payment, if any, To Contractor, DCM Form C-20: Consent is required for projects with P&P Bonds. Original has been delivered to Owner. Attach one copy to FPC.
☐	☐	General Contractor's Roofing Guarantee, DCM Form C-9, and Other Specified Roofing Guarantees, if any: Attached to Certificate of Substantial Completion.
☐	☐	Contractor's One-Year Warranty: Original has been delivered to the Owner. Attach one copy to the FPC.
☐	☐	Other Warranties: All other specified original warranties has been delivered to the Owner. Attach one copy to the FPC.
☐	☐	Record Documents: Specified "As-built" plans and specifications have been delivered to the Owner.
☐		O & M Manuals: Specified instructions and O&M Manuals have been delivered to the Owner.
☐	☐	Time Extension: Over-run of Contract Time has been reconciled by: ☐ Change Order ☐ Liquidated Damages ☐ Attached explanation
☐	☐	Additional Documents or Explanations which are attached:

Submitted By: _____
Architectural / Engineering Firm

_____ _____ _____
Signature | Printed Name and Title | Date

Final Reconciliation of Fees: Between the final change order execution and the year-end inspection, report the final project cost to https://appengine.egov.com/apps/al/dcm-fees (back-up is not needed unless requested by DCM). DCM will then email a Final Reconciliation of Fees Statement to the Owner. If the Final Statement shows a net payment is owed to DCM, that amount must be paid prior to scheduling the year-end inspection. If the Final Statement shows a net refund is owed then a check will be mailed to the Owner.

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ALABAMA DEPARTMENT OF FINANCE
CONSTRUCTION MANAGEMENT DIVISION
ADMINISTRATIVE CODE

CHAPTER 355-16-1
COLLECTION OF USER FEES

TABLE OF CONTENTS

ED NOTE: THE RULES OF THE BUILDING COMMISSION, CHAPTER 170-X-8, WERE TRANSFERRED TO THE DEPARTMENT OF FINANCE PURSUANT TO ACT 2015-435.

355-16-1-.01 Applicability
355-16-1-.02 Calculation Of Basic Plan Review And Permit Fees
355-16-1-.03 Fees Required
355-16-1-.04 Payment Of Fees
355-16-1-.05 Final Reconciliation Of Fees
355-16-1-.06 Penalties
355-16-1-.07 Contract Document Administration Fees (Repealed 1/13/20)

355-16-1-.01 Applicability. The following procedures and user fees are applicable to new construction, additions, or alteration projects for buildings under the jurisdiction of the Alabama Division of Construction Management as defined by the Code of Ala. 1975, Title 41, Section 41-9-162 and authorized by Section 41-4-400(a)(7).
Author: Frank Barnes
Statutory Authority: Code of Ala. 1975, §41-4-400(a)(7).
History: New Rule: Filed October 27, 1994; effective December 1, 1994. **Repealed:** Filed October 12, 1995; effective November 16, 1995. **New Rule:** Filed August 7, 2014; effective September 11, 2014. **Amended:** Published November 29, 2019; effective January 13, 2020.

355-16-1-.02 Calculation Of Basic Plan Review And Permit Fees.

Construction Cost	Basic Plan Review Fee	Basic Permit Fee
Less than $1000	No fee.	No fee, unless inspection required, in which case a $15.00 fee for each inspection shall be charged.
$1,001 to $50,000	One-half of the permit fee which is $15.00 for the first $1,000.00 plus $5.00 for each additional thousand or fraction thereof, to and including $50,000.00.	$15.00 for the first $1,000.00 plus $5.00 for each additional thousand or fraction thereof, to and including $50,000.00.
$50,001 to $100,000	One-half of the permit fee which is $260.00 for the first $50,000.00 plus $4.00 or each additional thousand or fraction thereof, to and including $100,000.00.	$260.00 for the first $50,000.00 plus $4.00 or each additional thousand or fraction thereof, to and including $100,000.00.
$100,001 to $500,000	One-half of the permit fee which is $460.00 for the first $100,000.00 plus $3.00 for each additional thousand or fraction thereof, to and including $500,000.00.	$460.00 for the first $100,000.00 plus $3.00 for each additional thousand or fraction thereof, to and including $500,000.00.
$500,001 and up	One-half of the permit fee which is $1,660.00 for the first $500,000.00 plus $2.00 for each additional thousand or fraction thereof.	$1,660.00 for the first $500,000.00 plus $2.00 for each additional thousand or fraction thereof.

Construction Cost: Construction Cost shall include the cost of the actual building construction, addition, or alteration work, including sitework.
Authors: Katherine Lynn, Frank Barnes
Statutory Authority: Code of Ala. 1975, §41-9-141(a)(8).
History: New Rule: Filed October 27, 1994; effective December 1, 1994. **Repealed:** Filed October 12, 1995; effective November 16, 1995. **New Rule:** Filed August 7, 2014; effective September 11, 2014. **Amended:** Published November 29, 2019; effective January 13, 2020.

355-16-1-.03 Fees Required.

(1) The Basic Plan Review Fee, the Basic Permit Fee, and the Basic Contract Document Administration Fee are subject to the Final Reconciliation at the close of construction as described in Rule 355-16-1-.05.

(2) Basic Plan Review Fee: This fee includes review of Schematic, Preliminary, Final, and one revised Final Plan Submittal.

(a) If the first submittal of a new project is for a schematic or preliminary review, it shall be accompanied by ½ of the Basic Plan Review Fee not to exceed $500. Submittals sent in without this fee will not be reviewed until payment is received.

(b) The final submittal of each project shall be accompanied by a payment for the balance of the Basic Plan Review Fee. Submittals sent in without this final submittal fee will not be reviewed until payment is received.

(c) Written final plan review comments must be sent by the Division of Construction Management to the architect within 30 calendar days of receipt of the submittal. If the submittal is not reviewed within this time limitation, the balance of the Basic Plan Review Fee is waived.

(3) Basic Permit Fee: This fee shall include the following required major building inspections: Pre-Construction Conference, Pre-Roofing Conference, Above-Ceiling Inspection, Final Inspection, and Year-End Inspection. Additional required inspections such as fire alarm inspections, kitchen hood inspections, elevator inspections, and other such inspections shall be included as part of the Basic Permit Fee.

(a) The Basic Permit Fee is due upon approval or receipt of the Construction Contract. The Pre-Construction Conference will not be performed prior to receipt of the Basic Permit Fee.

(4) Basic Contract Document Administration Fee: The Basic Contract Document Administration Fee applies to contracts that are administered by the Division of Construction Management. The fee covers review of the Owner/Architect Agreement and Construction Contract along with related amendments, change orders, service invoices, and pay requests.

(a) Payment must be received before the associated contract is fully executed. The total fee is ½% of the Construction Cost and it is paid in the following 2 parts:

(i) ¼% of the Project Budget for the Owner/Architect Agreement

(ii) ¼% of the Construction Cost for the Construction Contract.

(5) Additional Fees:

(a) If more than one revised Final Plan Submittal is required, an additional fee shall be required for each additional revised submittal. This additional fee shall be equal to the lesser of the following: 15% of the Basic Plan Review Fee or $2000. The time restrictions and conditions which apply to routine submittals shall apply to additional submittals.

(b) If the contractor schedules an inspection and it is determined by the Division of Construction Management Inspector on site that the contractor has not met required benchmarks or the inspection is cancelled without 48-hours' notice, the Division of Construction Management shall require an additional fee of $1500. This additional inspection fee shall be applied to each additional inspection that is required to be rescheduled.

(c) Changes to plans for rebid or a significant revision in the scope of work may incur an additional fee, up to the amount of the Basic Plan Review Fee, based on the reviewers' evaluation of the extent of the changes reviewed.

(d) Projects owned and locally funded by municipality and county governments must be submitted for a review for compliance with the current ADA Standards for Accessible Design. The additional fee for this service is 50% of the Basic Plan Review Fee, with a maximum of $500.00. If more than one revised Final Plan Submittal is required, the fee for each additional review will be 15% of the Basic Plan Review Fee.

(e) In addition to the Schematic, Preliminary, and Final Review Submittals, the Owner may request an optional 65% Intermediate Review to include all systems of the project at a point that is less than 100% complete. The additional fee for this review will be 65% of the Basic Plan Review Fee.

(f) The Basic Contract Document Administration Fee includes review of the original submitted document and one revision. When more than one revision is required, an additional fee of $200 will be charged to the design professional for each additional document submittal until the document is executed.
Author: Frank Barnes
Statutory Authority: Code of Ala. 1975, §41-9-141(a)(8).
History: **New Rule:** Filed October 27, 1994; effective December 1, 1994. **Repealed:** Filed October 12, 1995; effective November 16, 1995. **New Rule:** Filed August 7, 2014; effective September 11, 2014. **Amended:** Published November 29, 2019; effective January 13, 2020.

355-16-1-.04 Payment Of Fees.

(1) The balance of the Basic Plan Review Fee payment shall be accompanied by the "Plan Review Fee Worksheet" and a copy of the architect's latest estimated Construction Cost. The cost estimate shall be the basis for calculating the estimated Basic Plan Review Fee on the fee worksheet.

(2) The Basic Permit Fee payment shall be accompanied by the completed "Permit Fee Worksheet" and a copy of the executed Construction Contract. The Construction Contract shall be the basis for calculating the total fee on the fee worksheet.

(3) Fee payments are nonrefundable to the extent that work has been performed by the Division of Construction Management.

(4) Fee payments shall be paid by either (i) check or money order made payable to "Alabama Department of Finance-Division of Construction Management," (ii) by an electronic means accepted by the Division of Construction Management, or (iii) an inter-agency transfer. Fees are deemed paid when the funds represented by the payment method are received by or made available to the Division of Construction Management.

(5) Check or money order payments shall be received only at the Division of Construction Management's office in Montgomery.
Authors: Katherine Lynn, Frank Barnes
Statutory Authority: Code of Ala. 1975, §41-9-141(a)(8).

History: New Rule: Filed October 27, 1994; effective December 1, 1994. **Repealed:** Filed October 12, 1995; effective November 16, 1995. **New Rule:** Filed August 7, 2014; effective September 11, 2014. **Amended:** Published November 29, 2019; effective January 13, 2020.

355-16-1-.05 Final Reconciliation Of Fees.

(1) Final Reconciliation: The Basic Plan Review Fee, the Basic Permit Fee, and the Basic Contract Document Administration Fee are paid based on the best estimate of the Construction Cost at the time each fee is due. When construction is complete, a Final Reconciliation will recalculate each of these fees using the actual Construction Cost. The Final Reconciliation will determine the amount due from or refunded to the Owner. The Owner has the final responsibility for payment of all fees.

(2) The actual Construction Cost for the final Basic Plan Review Fee shall be adjusted to include the lowest bid on any additive unawarded alternates from the bid tab. The actual Construction Cost for the final Basic Permit Fee and the final Basic Contract Document Administration Fee shall be adjusted for any change orders and for any sales-tax credit received by the Owner.

Author: Katherine Lynn
Statutory Authority: Code of Ala. 1975, §41-9-141(a)(8).
History: New Rule: Filed October 27, 1994; effective December 1, 1994. **Repealed:** Filed October 12, 1995; effective November 16, 1995. **New Rule:** Filed August 7, 2014; effective September 11, 2014. **Repealed and New Rule:** Published November 29, 2019; effective January 13, 2020.

355-16-1-.06 Penalties. Where work, for which Division of Construction Management approval is required, is started or proceeds prior to obtaining said approval, the fees herein specified shall be doubled. The payment of such double fee shall not relieve any persons from fully complying with the requirements of the Division of Construction Management in the execution of the work nor from any other penalties prescribed herein.

Author: Frank Barnes
Statutory Authority: Code of Ala. 1975, §41-9-141(a)(8).

History: New Rule: Filed August 7, 2014; effective September 11, 2014. **Amended:** Published November 29, 2019; effective January 13, 2020.

355-16-1-.07 Contract Document Administration Fees. (REPEALED)
Author: Katherine Lynn
Statutory Authority: Code of Ala. 1975, §41-9-141(a)(8.
History: New Rule: Filed August 7, 2014; effective September 11, 2014. **Repealed:** Published November 29, 2019; effective January 13, 2020.

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E-Verify Memorandum of Understanding

Instructions for inclusion in project manuals.

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

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

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

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SECTION 0090

APPROVED SOILS REPORT

The approved soils report is included here for the information of the Contractor and the guidance of Special Inspectors operating under Chapter 17 of the International Building Code. Neither the Owner nor the Architect assume any responsibility for the accuracy or completeness of the investigatory portion of the report, and both caution bidders that conditions may be encountered which are not reflected. Bidders may draw their own conclusions from the data indicated, or obtain, at their own expense, supplementary information.

The recommendations portion of the report is incorporated as a contract requirement pursuant to Chapter 17 of the IBC. See Section Earthwork.

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Geotechnical Subsurface Investigation Report (revised)

AIDT Fleet Management Building
Technology Court
Montgomery, Alabama
Our Job No. A25114.00516.000

Geotechnical Subsurface Investigation Report (revised)

AIDT Fleet Management Building

Technology Court
Montgomery, Alabama
Our Job No. A25114.00516.000

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October 21, 2025



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Typical Underdrain Detail Plan
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Boring Plans
Test Boring Logs
Laboratory Test Data
Notes and References
Investigative Procedures
Unified Soil Classification Chart
General Terms and Conditions

1.0 Introduction

UES Professional Solutions 18, LLC (UES) is pleased to provide this report of our subsurface investigation for the proposed AIDT Fleet Management Building in Montgomery, Alabama. The scope of this investigation included 2 soil test bores in the planned fleet maintenance building area. The quantity and location of the test bores were taken in accordance with the authorized scope of work. The intent of this investigation was to evaluate the subsurface conditions with respect to support of the proposed fleet maintenance building.

This report has been prepared in accordance with generally accepted current standards of geotechnical engineering practices and no other warranties are expressed or implied. The recommendations of this report are based on our professional judgment considering the proposed construction as described by this report and the data available to us. The construction should include follow-up geotechnical monitoring and construction materials testing by our firm. It is important that we confirm the expected subsurface conditions based on the soil boring data during the construction phase. This report is presented on the basis that all of our recommendations will be followed.

2.0 Summary

Generally, the subsurface investigation indicated conditions which should be compatible with the planned fleet maintenance building provided the site preparation and construction are completed in accordance with the recommendations which follow in this report. Please note that our recommendations are site specific and may not be suitable for other types of structures or other locations.

A total of 2 test bores were completed to evaluate the subsurface stratigraphy. Beneath a 2” layer of asphalt and a 5 to 6” layer of base, the test bores penetrated fill or in-situ earth described as cohesive clayey sand, sandy clay and Plastic clay (sections with calcareous nodules, gravel and/or rock fragments and sections termed marl hardpan). The predominate sand earth is of a marginal drainage classification. The predominate clay earth is of a poor drainage classification. The test bores indicated low to stronger soil strengths and consolidation characteristics which are expected to be compatible with the planned type of construction.

Test bore B-1 indicated groundwater at 5.0’ below ground surface (bgs) during drilling. Twenty-four hours following drilling, the test bores indicated water levels at depths of 3.8 and 17.2’ bgs and had caved to 6.9 and 26.9’ bgs. It should be noted that localized seasonal "perched" water conditions are common in the clay earth typical of that penetrated at this site. Generally, water which permeates the ground surface travels along thin seams within the clay earth. In open excavations groundwater seepage can be encountered at various levels due to the irregular nature of the water carrying seams. The groundwater condition at this site is subject to seasonal variation and is expected to fluctuate. Provided the groundwater is properly controlled during construction, we do not anticipate that the groundwater condition will affect the long-term performance of this project. Shallow groundwater (if any) encountered during construction can be controlled using shallow drainage ditches, sump pumps, and/or underdrains.

The expansive and poor drainage classification of the clay earth predominate at this site is one of the primary concerns for the site development and the design of foundations and floor slabs. The expansive clay soil can undergo volume change when subjected to fluctuating moisture contents and can cause severe damage to foundations, floor slabs, etc., which bear in or near the zone of moisture fluctuation. Providing adequate surface drainage during and following construction is critical to the performance of the foundations and floor slabs. Furthermore, site preparation during the normally wetter winter and spring seasons can cause significant time delays in the construction due to the difficulty of processing the native clay earth when in a wet or saturated condition.

Following proper site preparation for the “engineered fill” pad, the project can use shallow spread foundations and a ground supported floor bearing slab in the “engineered fill” pad. These spread foundations can be designed to bear at least 18” below finish grade in the “engineered fill” pad utilizing net allowable soil bearing pressures of up to 2,500 pounds per square foot for isolated square foundations and 2,000 pounds per square foot for continuous foundations.

The recommendations in this report provide an economical approach to the development using shallow foundations and ground supported floor slabs. Please note that there are substantial risks for some movement of the foundations and floor slabs to occur due to the nature of the native clay soil at this site and this movement may cause cracking and distress in the structure, unlevel floor slabs, etc. In most cases this movement causes cosmetic damage although significant movement may cause some structural damage which could require remedial foundation stabilization and repair. The recommendations in this report are intended to reduce the risk of structural distress, however, extremes in weather conditions during and following construction, changes in drainage conditions, etc., can result in damage to the structure caused by volume changes in the clay soil. There are other methods of construction which can be used to eliminate most of the risks associated with construction in expansive clay soil, however the cost of these alternate methods are substantially more expensive compared to the recommendations provided in this report.

The pavement sections may be developed using locally available materials and conventional construction techniques. The pavements may be constructed using a "Full-Depth" asphalt pavement section or concrete pavement section placed directly over an improved layer of the subgrade earth.

3.0 Evaluation

3.1 Site Location

The site subject to this report is located on Technology Court approximately 300'southwest of its intersection with US Hwy 82, in Montgomery, Montgomery County, Alabama. Our field personnel utilized the provided site plan and a survey grade GPS to locate the test bores and to record the ground elevation at each bore location. The accuracy of the GPS can be influenced by tree canopies, building structures, atmospheric conditions and other interferences. The horizontal locations and elevations at the bore locations have not been field verified and should be considered approximate. The enclosed boring plans further describe the test bore locations.

3.2 Site Conditions

The investigation site consists of a portion of a parking lot that exists within the AIDT Facility.

The local terrain is described as gently sloping. There was approximately 0.5' of relief between the test bore locations. Surface drainage was described as good in areas observed during drilling. Surface water is expected to flow over the site and discharge beyond the area planned for development. There were no significant areas of ponded surface water located on the site during the field testing.

Site access was described as good. There was no difficulty mobilizing our truck mounted drilling equipment over the site to access the selected test bore locations.





3.3 Site Geology and Subsurface Stratigraphy

Geologically, the site is located in the Coastal Plain Provence and is underlain by the Mooreville Chalk Formation deposited in the Upper Cretaceous Epoch of the Cretaceous Period. Typically, the Mooreville Chalk formation yields finely sandy argillaceous fossiliferous chalk, the upper sections of which have weathered into a cohesive expansive clay soil.

Beneath a 2” layer of asphalt and a 5 to 6” layer of base, the test bores penetrated fill or in-situ earth described as cohesive clayey sand, sandy clay and Plastic clay (sections with calcareous nodules, gravel and/or rock fragments and sections termed marl hardpan). Laboratory analyses confirmed “CH” Unified Soil Classifications of the clayey sand earth with plasticity indices of 50 and 54. The penetration resistance values, “N”, ranged from 6 to 100+ blows per foot indicating relative densities of loose in the predominate sand earth and consistencies of firm to very hard in the predominate clay earth. Moisture tests indicated water contents ranging from 12.4 to 49.9%. The test bores were terminated in the in-situ earth at depths of 30’ below existing ground surface.

Test bore B-1indicated groundwater at 5.0’ bgs during drilling. Twenty-four hours following drilling, the test bores indicated water levels at depths of 3.8 and 17.2’ bgs and had caved to 6.9 and 26.9’ bgs.

The enclosed test boring records further describe the subsurface stratigraphy, Unified Soil Classifications, penetration resistance values, moisture contents, caved depths, water levels, and boring termination depths.

3.4 General Construction Information

The following data was extrapolated from the provided construction information and plans. The construction data described in this section was considered in the formulation of our recommendations; therefore, any significant changes, additions or modifications to the planned development may have a significant impact on our recommendations. We ask that we be advised of any significant errors, omissions, or revisions in the construction data to permit further comment as needed.

We understand that the proposed fleet maintenance building will utilize spread foundations and a ground-supported slab. Specific structural loads were not provided; however, we anticipate that concentrated loads will be less than 25 kips and that wall loads will be less than 3.0 kips per linear foot.

Conceptual grading information was provided. We anticipate earth cutting/filling thicknesses will be less than 2' to establish subgrade elevation (not considering the undercut required to construct the “engineered fill” pad as described in sections 4.5 and 4.6). Fill earth required to establish subgrade elevation is expected to originate from local off-site borrow sources.

Specific traffic data was not provided. The pavements are expected to be designed for a medium to heavy duty traffic classification with a moderate volume of medium to heavy weight trucks.

4.0 Recommendations - Site Preparation

4.1 "Controlled Areas"
Define those areas throughout and 5' beyond the proposed building area and throughout significant slopes as "controlled areas".

4.2 Stripping
Remove all pavement, topsoil and vegetation (if any), curbs, sidewalks, abandoned utilities, and otherwise unsuitable materials from the "controlled areas". All unsuitable materials should be wasted off-site or in non-structural areas.

4.3 Surface Drainage
Maintain the "controlled areas" in a drained condition that will ensure the continual removal of surface water that may flow over the construction areas. Temporary site drainage, which is critical for the project, can be enhanced by the installation of the final site drainage structures during the early phases of the site development.

4.4 Site Examination
Prior to the placement of fill earth and following removal of cut earth, the "controlled areas" should be examined by UES representatives. The examination should include proof rolling with construction equipment, test pits, supplemental test bores, visual examinations, etc., as needed to determine the presence, location, and extent of any localized organic, weak, and/or otherwise unsuitable soil conditions which may exist at the site. Areas which exhibit weak soil or otherwise unsuitable conditions should be corrected in accordance with our recommendations. Typically, areas which yield excessively under proof rolling should be undercut to expose a firm level of soil followed by backfilling with "engineered fill".

4.5 Undercutting the Fleet Maintenance Building Area
Construct a minimum 6’ thick “engineered fill” pad using a non-expansive “select fill”. A minimum 5' of undercutting below existing pavement should be completed to remove the upper sections of expansive clay soil. The final thickness of the “engineered fill” pad may exceed 6'. Prior to fill placement, the exposed subgrade should be mixed, moisture conditioned and compacted to 98% of the materials ASTM-D698 standard density and graded for drainage.

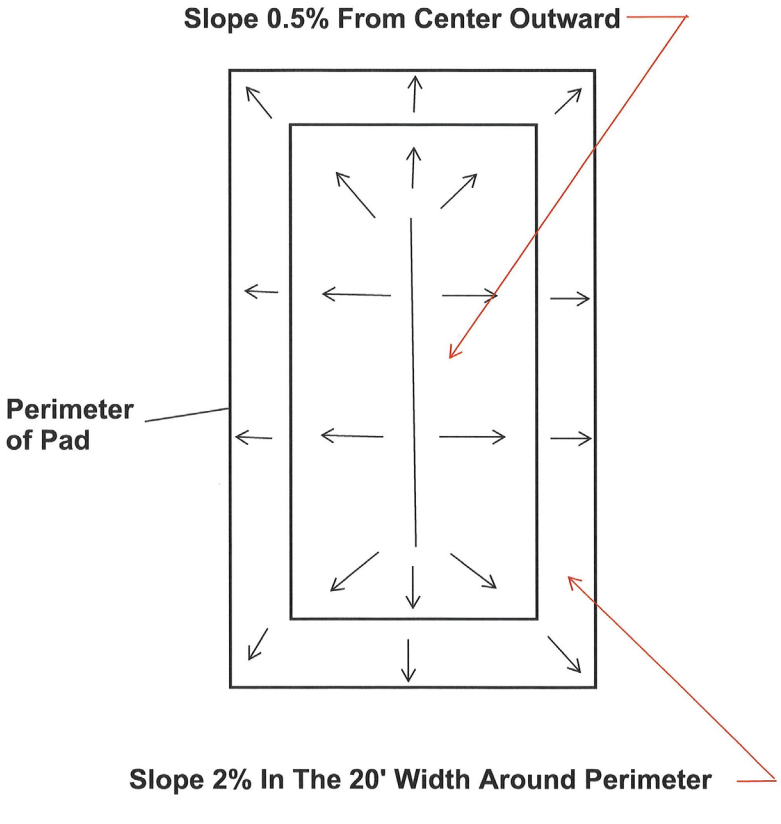
4.6 Proof-rolling
Prior to placing the backfill in the undercut area, the subgrade should be proof rolled. Proof-rolling should be completed using rubber-tired construction equipment or a partially loaded dump truck weighing 40 tons after removal of any cut earth or required undercut earth. Proof-rolling should include a minimum of 2 passes in perpendicular directions over the pavement "controlled areas". Areas which yield excessively should be undercut to a firm level followed by backfilling with “engineered fill”. Weak in-situ soil can be improved by compacting the weak soil to at least 98%

standard density. Areas which fail to compact or areas which yield excessively under proof- rolling should be undercut to expose firm earth.

4.7 "Engineered Fill" Pad

A minimum 6’ thick “engineered fill” pad is required. Remove the top 5' (minimum) of the existing soil to a distance 5' beyond the outside edge of the fleet maintenance structure and replace with "engineered fill" for support of the fleet maintenance structure. See section 7.5 for undercut requirements in the fleet maintenance structure area. The final thickness of the “engineered fill” pad may exceed 6'. The exposed subgrade should be moisture conditioned to 0 to 3% above the materials optimum moisture and compacted to 98% standard density. The subgrade should be crowned in the center of the fleet maintenance structure pad and sloped at least 0.5% to the outside edges of the fleet maintenance structure pad, increasing the slope to 2.0% in the final 20’ around the pad perimeter. The schematic drawing below shows the recommended grading for the native clay subgrade prior to fill placement. A perimeter underdrain should be installed at the edge of the fleet maintenance structure pad to intercept any water which might otherwise accumulate in the pad. See detail in attachments for more information on the underdrain.

Note: Proper layout of the "engineered fill" pad and proper location of the structure on the pad is necessary so that the pad extends at least 5' beyond the edge of the structure. The "engineered fill" pad dimensions should be verified prior to fill placement and again following layout of the fleet maintenance structure.



4.8 Fill Earth

Fill earth required to establish subgrade elevation in the "controlled areas" under the “engineering fill” pad should consist of native clay material.

4.9 "Select Fill"

The "select fill" should consist of a clean, non-saturated, and non-organic clayey sand or sandy clay as follows.

“Select Fill” Composition

Sieve Requirements	% Passing
3"	100
No. 4	75 - 100
No. 200	35 - 55
Liquid Limit	35 max
Plasticity Index	8 to 16
Maximum Dry Unit Weight Based on ASTM-698 Standard Density Test	≥ 105 pcf

4.10 "Engineered Fill"

Place fill earth or "select fill" earth in thin lifts not to exceed 8" loose measure and thoroughly compact each lift of fill to at least 98% of the materials ASTM D-698 standard density. The top 12” of “engineered fill” pad should be compacted to 100% standard density. At the time of densification, the moisture content of the "engineered fill" earth should be within 3% of the materials optimum water content for the “select fill” and to 3% above the optimum water content for the native clay. Following acceptance for moisture and density, any "engineered fill" areas which are disturbed by the construction, weather or otherwise disturbed should be corrected and retested prior to the placement of additional fill earth or structures.

4.11 Underdrainage

A temporary underdrain (composed of size #57 or #67 gravel enveloped in filter cloth such as Mirafi 140N or equivalent) and sump excavation with a pump should be utilized to ensure that the excavation remains free of standing water while the "engineered fill" pad is being constructed. After the “engineered fill” pad has been compacted as specified the "aggregate filled" underdrain may be abandoned and the sump excavation may be backfilled as appropriate.

5.0 Recommendations - Shallow Spread Foundations and Ground Supported Floor Slabs

5.1 Maximum Net Allowable Soil Bearing Pressures

2,500 pounds per square foot for isolated square foundations
2,000 pounds per square foot for continuous foundations.

Note: Foundations should bear in the firm to stronger “select fill” placed as "engineered fill" earth exhibiting “N” values of 8 or greater.

5.2 Minimum Foundation Dimensions

Depth - Bottom of perimeter foundations below outside finish grades - 18".
- Bottom of interior foundations below the top of ground supported floor slabs - 12".

Width - Isolated square foundations - 30".
- Continuous wall foundations - 18".
- Turned down slab edges - 12"

Note: All foundations should be sized for total load but should not be less than the preceding minimums. A minimum 4’ thickness of “select fill” should be provided below the bearing level for all foundations. The use of the recommended minimum foundation depths considers that adequate surface drainage is provided at finish subgrade elevation. Large trees should not be located near the structure. The owner should be cognizant of the potential damage to foundations and slabs if tree root systems extend beneath or near the foundations.

5.3 Settlement and Swell Potential

The planned structure will be subjected to total long term settlements of up to 1" with differential settlements of up to 0.5". Provided the site is developed following the recommendations in this report, the estimated shrink / swell potential is less than 1". The structure should be designed to tolerate these estimated settlements and swells. Control joints should be used at appropriate locations to reduce the effects of differential movement.

5.4 Foundation Construction

Do not permit foundation bearing soil to become saturated or dry excessively. Sections which become saturated or dry excessively should be undercut just prior to placement of the foundation concrete. All foundations should be constructed as expediently as possible following excavation of the foundation trench.

Weak soil exposed in foundation trenches should be compacted using a mechanical jumping jack type compacter.

Following construction of the foundations, the area adjacent to the foundation should be maintained in a drained condition. Water should not be permitted to pond adjacent to the structure foundations during or following construction. Backfill adjacent to the structure foundations as soon as possible to provide positive drainage. Backfill with clean soil typical of the material excavated from the foundation trenches. Masonry sand, broken brick and block or other construction debris should not be used to backfill against the foundations.

5.5 Acceptance of Foundation Bearing Levels

All foundation excavations should be examined by the projects geotechnical consultant prior to the installation of the foundation reinforcement and concrete. All unacceptable conditions should be corrected in accordance with the geotechnical consultant's recommendations.

5.6 Floor Slab Bearing Conditions

Floor slabs should bear over the “select fill” as described for the shallow spread foundations in section 5.1. Provide a minimum 15 mil thick vapor barrier between the "select fill" subgrade layer and the floor slabs.

5.7 Control/Expansion Joints

A liberal amount of control/expansion joints should be used to reduce the effects of the normal amounts of differential settlement and concrete shrinkage expected. The design and location of control/expansion joints should be in accordance with the recommendations of the Portland Cement Association.

5.8 Acceptance of Floor Slab Bearing Levels

All floor slab bearing levels should be examined by the project’s geotechnical consultant prior to the placement of the drainage fill and vapor barrier. All unacceptable conditions should be corrected in accordance with the geotechnical consultant's recommendations.

5.9 Seismic Design Parameters

The seismic design parameters from the ASCE/SEI 7-22 are as follows for the site in Montgomery, Alabama:

$S_S = 0.18$ $S_{MS} = 0.24$ $S_{DS} = 0.16$
$S_1 = 0.085$ $S_{M1} = 0.18$ $S_{D1} = 0.12$
Site Class D

Seismic Design Category B for Use Group I, II or III and Seismic Design Category C for Use Group IV.

6.0 Recommendations - Pavements

6.1 Reference

Alabama Department of Transportation, (ALDOT), *Standard Specifications for Highway Construction* - 2022 edition.

6.2 Subgrade Support Values

An estimated California Bearing Ratio (CBR) value for the native clay earth expected to be predominate at subgrade elevation is 3. A subgrade modulus of 120 pci is recommended for design of the concrete pavements.

6.3 Traffic Data

Specific traffic data was not provided. The pavements are expected to be designed for a medium to heavy duty traffic classification with a moderate volume of medium to heavy weight trucks.

6.4 Subgrade Improvements

The top 18" of the final subgrade soils may be developed with “select fill” placed as “engineered fill”.

6.5 Medium to Heavy Duty Pavements

The pavements, based on an assumed CBR value of 3 and a design service life of 20 years, The pavements may be constructed using a "Full-Depth" asphalt pavement section or concrete pavement section placed directly over an improved layer of the subgrade earth as described below.

6.5.1 "Full-Depth" Bituminous Pavement

2.0" - ALDOT Section 424-A 341 bituminous wearing surface.
1 - ALDOT Section 405 bituminous tack coat.
3.5" - ALDOT Section 424-B 637 bituminous binder.
1 - ALDOT Section 401 bituminous prime coat.
18" - ALDOT Section 230 improved roadbed – “select fill” (98% standard density in the lower 6" and 100% standard density in the upper 12").

6.5.2 Concrete Pavement Section

7.0" - 4000 psi compressive strength (550 psi flexural strength) concrete with maximum 4" slump.
18" - ALDOT Section 230 improved roadbed – “select fill” (98% standard density in the lower 6" and 100% standard density in the upper 12").

6.6 Trash Dumpster Loading Areas

A minimum 7" thick concrete pad and 18" of “select fill” should be used in front and beneath trash dumpster areas to provide support for the sanitation vehicles during handling of the dumpsters.

6.7 Concrete Pavement Construction Joints

The design and location of construction joints should be in accordance with the recommendations of the Portland Cement Association. We recommend a maximum joint spacing of 10'. All joints should be filled with a suitable flexible joint compound to prevent water intrusion at the joints.

6.8 Material Thicknesses

All subgrade and pavement material thicknesses referred to in this section are completed thicknesses.

7.0 Recommendations - General

7.1 Utility Trenches

All utility trenches (new and existing) extending through the "controlled areas" should be back-filled with "engineered fill" or flowable fill as appropriate.

7.2 Grading and Drainage Improvements

Incorporate finish grades, side drainage ditches, underdrains, etc., to reduce the possibility of ponding surface water within 5' of foundations and significant slopes.

7.3 Vertical Cuts

Vertical cuts greater than 4' or cuts required to remain open for extended periods of time should be sloped or braced as required for the protection of workmen entering deep excavations. Heavy construction traffic and stockpiling of excavated earth or other materials should not be permitted near the top of open unsupported excavations. Current OSHA regulations should be adhered to with respect to excavations for this project.

7.4 Cut and Fill Slopes

Permanent cut and fill slopes should perform satisfactorily as steep as 3(H):1(V) in the native clay earth or "select fill". All slopes should be protected from erosion using suitable vegetation or pavements.

7.5 Quality Control

A qualified geotechnical and construction materials testing consultant should provide the following services;

7.5.1 Verify the results of stripping, proof-rolling, and correction of weak soil conditions, quality and density of "engineered fill", foundations and floor slab bearing levels.

7.5.2 Complete soil particle size, atterberg limits and laboratory compaction tests on each different type of fill earth used in the "controlled areas".

7.5.3 Complete a minimum of 2 field density tests in the fleet maintenance building area per each 16” of vertical thickness of fill. Also, a minimum of 1 field density test should be taken for each 40 linear feet per each 2' of vertical thickness of fill placed at utility trenches extending through "controlled areas".

7.5.4 Test all structural concrete in accordance with the guidelines established by the American Concrete Institute.

8.0 General Comments

The scope of this study did not include sampling or testing for an environmental analysis or assessment for this site. If an environmental assessment of this site is desired, we should be contacted for further comment.

The comments of this report do not consider local flood conditions. The local flood condition/elevation (if any) should be determined and considered in the design of this project.

The frost penetration depth in the area of this project is generally taken to be less than 10". Provided our recommendations for the development of foundations and floor slabs are followed, we do not expect that the frost penetration will have any detrimental effects on the performance of these structures.

The native clay earth penetrated at this site characteristically exhibits low electrical resistivities and can contribute to the corrosion of metal products. Metal pipes, etc., buried in the native clay should be protected or designed to eliminate the effects of such corrosion.

The comments of this report are based upon our interpretation of the construction information supplied by others, the data collected at the 2 soil test bores, and our visual examination of the site. The evaluation of subsurface conditions based on the 2 test bores taken with this study requires a certain amount of interpolation. Improper site preparation, extremes in climatic conditions, significant changes in locations, grades, time, etc., can each affect groundwater, surface, and subsurface conditions. If conditions are encountered as the construction advances which vary significantly from those described by this report, we should be contacted for supplemental comment.

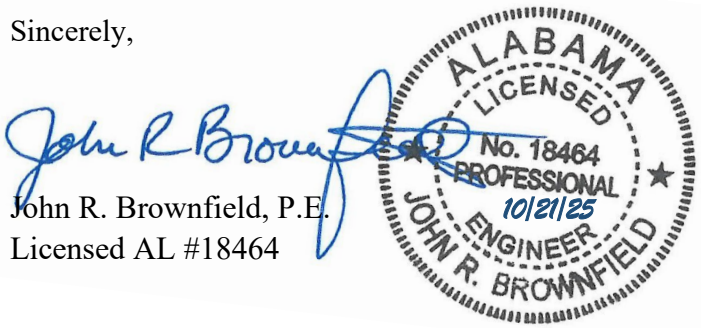
The scope of this investigation is not intended to establish volumetric estimates of the various subsurface materials at the site. Volumetric estimates may require a large number of test bores placed on a close grid to establish reliable cross sections. If volume estimates are required of us for the design/development of this project to advance, please contact us for further comment.

We are available to provide a review of the final plans and project specifications with respect to their compatibility with the contents of this report. Furthermore, our firm would appreciate the opportunity to continue to serve as the geotechnical consultant and to provide the construction materials testing and monitoring for this project.

9.0 Signature

Thank you for selecting UES to provide the geotechnical services for this project. We are available to answer any questions concerning our findings and recommendations. If we can be of any further assistance, please contact our office.

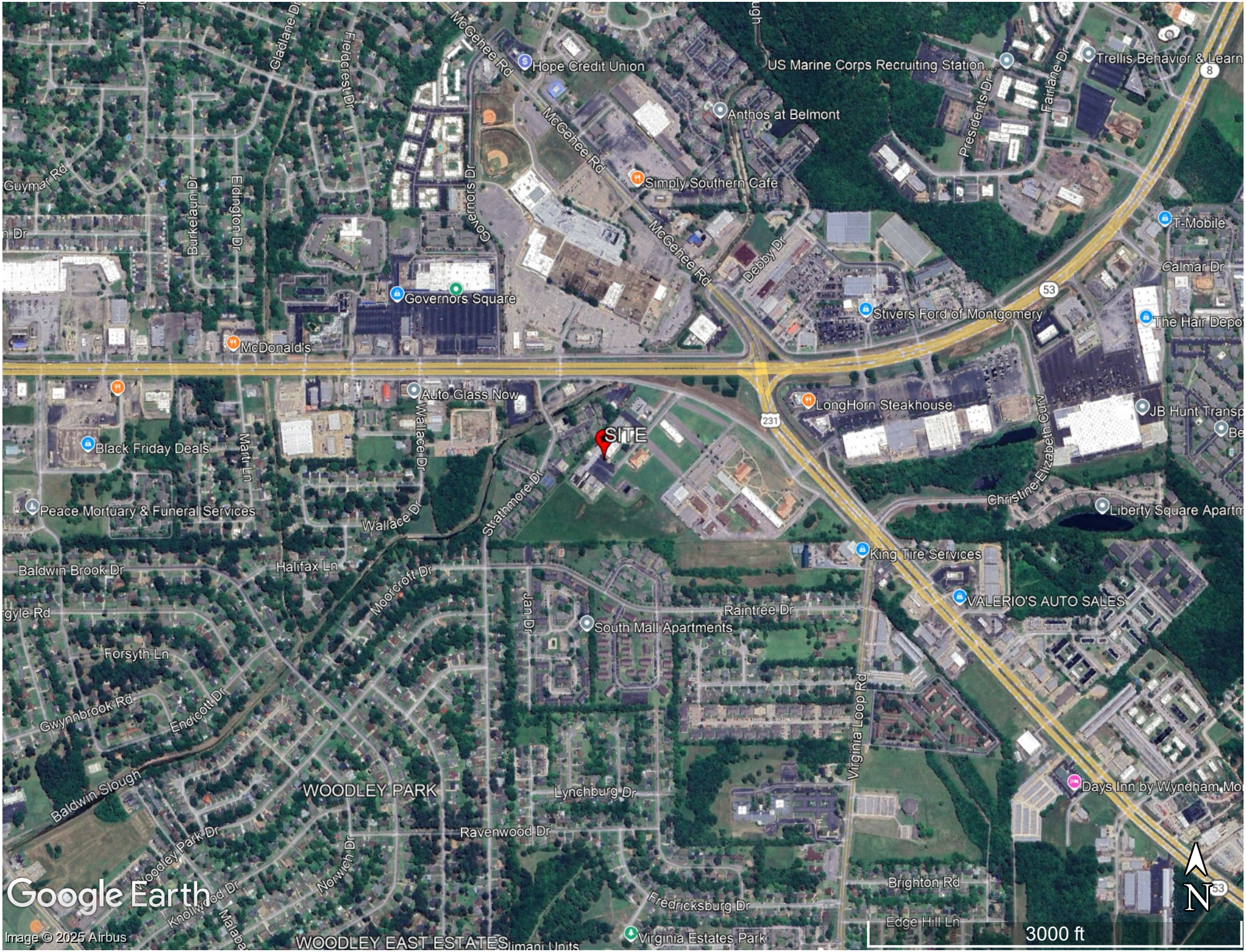
Sincerely,

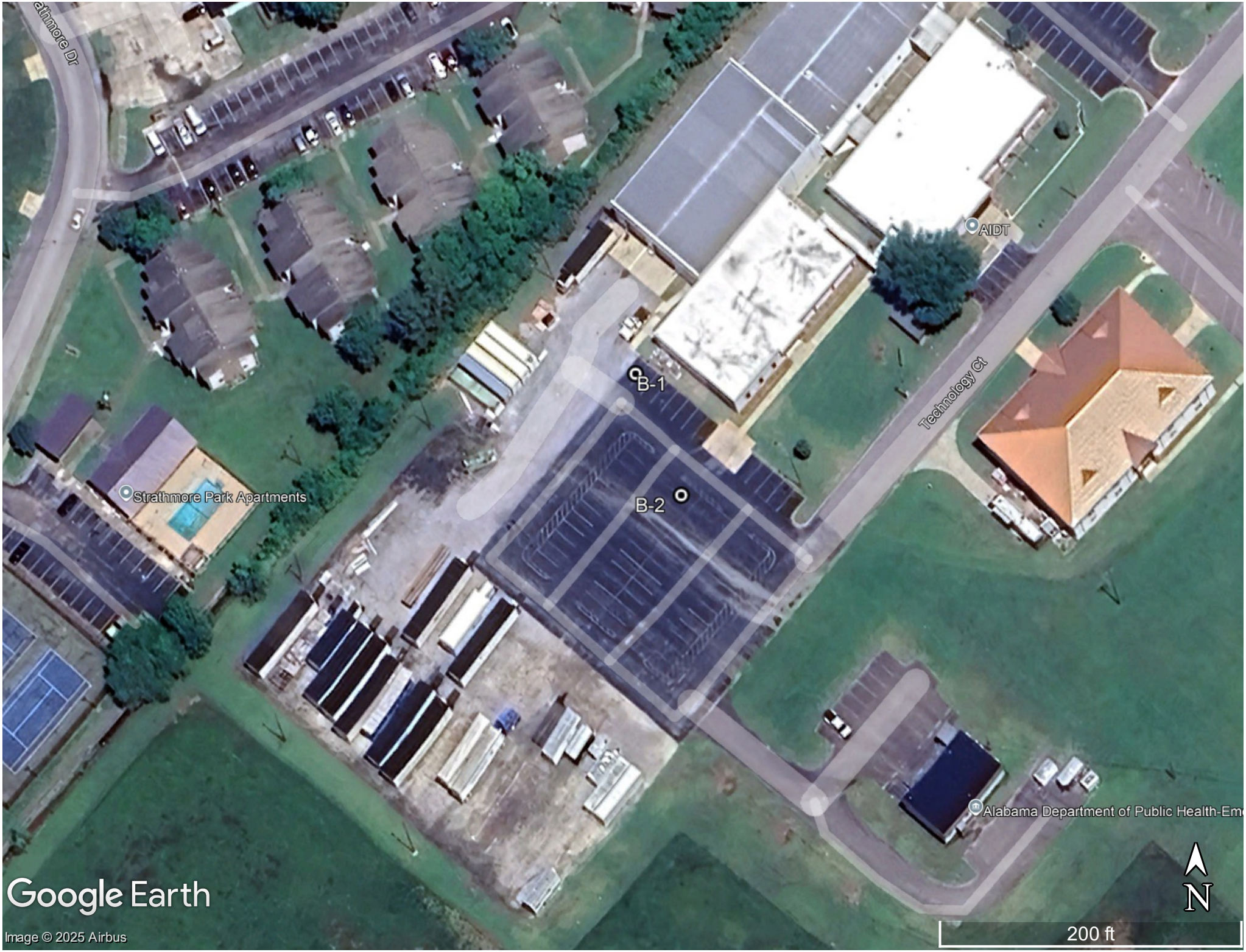


John R. Brownfield, P.E.
Licensed AL #18464

Report Distribution: 1 – Mr. Harry Williams (email)

JRB/as


SITE
McGehee Rd
Hope Credit Union
US Marine Corps Recruiting Station...
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Gwynnbrook Rd
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Baldwin Slough
WOODLEY PARK
Lynchburg Dr
Ravenwood Dr
Woodley Park Dr
Norwich Dr
Knollwood Dr
Brighton Rd
Fredricksburg Dr
Edge Hill Ln
Days Inn by Wyndham Mo
Virginia Estates Park
WOODLEY EAST ESTATES
Limani Units
Wallace Dr
Strathmore Dr
Moorcroft Dr
Jan Dr
Virginia Loop Rd
Christine Elizabeth Curv
Debby Dr
Calmar Dr
Guymar Rd
Burkelaun Dr
Edington Dr
Fieldcrest Dr
Gladlane Dr
Governors Dr
Presidents Dr
Fairlane Dr
Marti Ln
231
53
8
Google Earth
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3000 ft


Strathmore Dr
AIDT
B-1
Technology Ct
Strathmore Park Apartments
B-2
Alabama Department of Public Health-Em
Google Earth
Image © 2025 Airbus
N
200 ft

SOIL BORING NUMBER: B-1

PROJECT NAME AIDT Fleet Management Building
PROJECT NUMBER A25114.00516.000
DATE COMPLETED 08/04/2025
PROJECT LOCATION Montgomery, AL
DRILLING CONTRACTOR Southeast
LOGGED BY UES
DRILLING METHOD Hollow Stem Auger
ELEVATION 211.68'
CAVE IN 26.9'
INITIAL GW 5'
24 HR GW 17.2'

Depth (ft)	Elevation (ft)	USCS	Materials Description	Sample Number	Blow Counts (N-Value)	Raw N-Value Blows	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Fines Content (%)
	211.7									
		SC	**ASPHALT**: 2" 0.2 Base, 6" 0.7 **FILL**: Loose, red, clayey SAND (SC) 2.5		7-3-4 (7)	7	12.40			
	210	CL	**FILL**: Firm, tan, sandy CLAY (CL), w/ trace rock fragments 5.0		3-3-3 (6)	6	21.80			
5		CH	Firm, dark gray (CH), plastic clay 8.5		1-3-3 (6)	6	49.90	90	54	97.00
	205				2-3-5 (8)	8	29.00			
10			Firm to stiff, gray-tan (CH), plastic clay							
	200				3-6-10 (16)	16	28.30			
15										
	195		18.0		8-100 (100)	100	23.30			
20			Very hard to hard, gray (CH), plastic clay (marl hardpan)							
	190				19-25-31 (56)	56	15.30			
25										
	185				10-18-22 (40)	40				
30			30.0							
	180		boring terminated							

Notes:

SOIL BORING NUMBER: B-2

PROJECT NAME AIDT Fleet Management Building
PROJECT NUMBER A25114.00516.000
DATE COMPLETED 08/04/2025
PROJECT LOCATION Montgomery, AL
DRILLING CONTRACTOR Southeast
LOGGED BY UES
DRILLING METHOD Hollow Stem Auger
ELEVATION 211.24'
CAVE IN 6.9'
INITIAL GW None
24 HR GW 3.8'

Depth (ft)	Elevation (ft)	USCS	Materials Description	Sample Number	Blow Counts (N-Value)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Fines Content (%)
	211.2		**ASPHALT**: 2" 0.2		17-17-6 (23)	29.50			
		CH	Base, 5" 0.6						
			Tan, lime stabilized CLAY (CH) 2.5		1-3-4 (7)	41.40	83	50	96.10
5	205		Firm, dark gray, plastic CLAY (CH) 5.0		1-3-3 (6)	79.30			
			Firm, gray, plastic CLAY (CH), w/ gravel 8.5		3-6-7 (13)	14.60			
10	200		Stiff, tan-gray, plastic CLAY (CH), w/ calcareous nodules and trace rock fragments 13.5		3-7-8 (15)	28.80			
15	195		Stiff, gray, plastic CLAY (CH) 18.5		8-17-19 (36)	26.40			
20	190		Hard, gray, plastic CLAY (CH), (marl hardpan) 20.0						
			boring terminated						
25	185								
30	180								

Raw N-Value Blows: 23, 7, 6, 13, 15, 36

Notes: -

650 Oliver Road
Montgomery, AL 36117

334.213.5647
www.teamues.com

Soil Classification Test

Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4318

Laboratory ID# 4619

Report Date: 08/11/2025

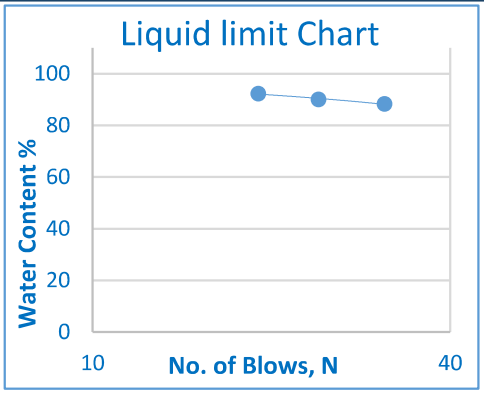
Project Name:	GEO-AIDT Fleet Maintenance Facility	**Project Number:**	A25114.00516.000
Client Name:	PH&J Architects, Inc.	**Sample Number:**	N/A
Location:	B-1	**Depth (ft):**	5-6.5

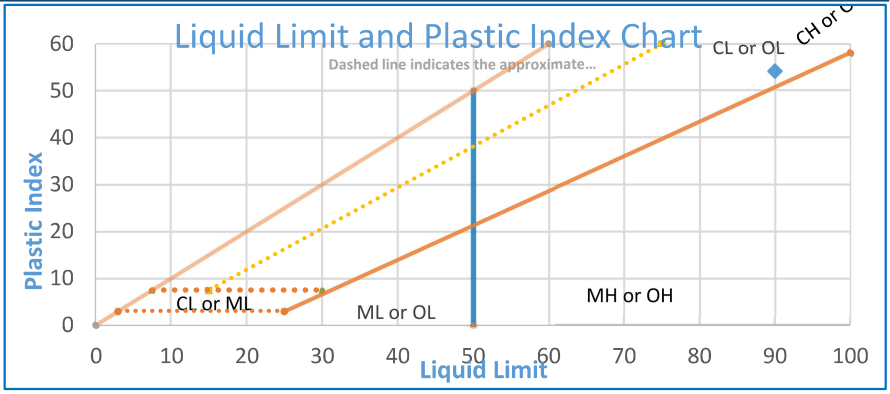
Material Classification

Material Color Description: Dark Gray **Moisture content:** N/A **Organic content:** N/A

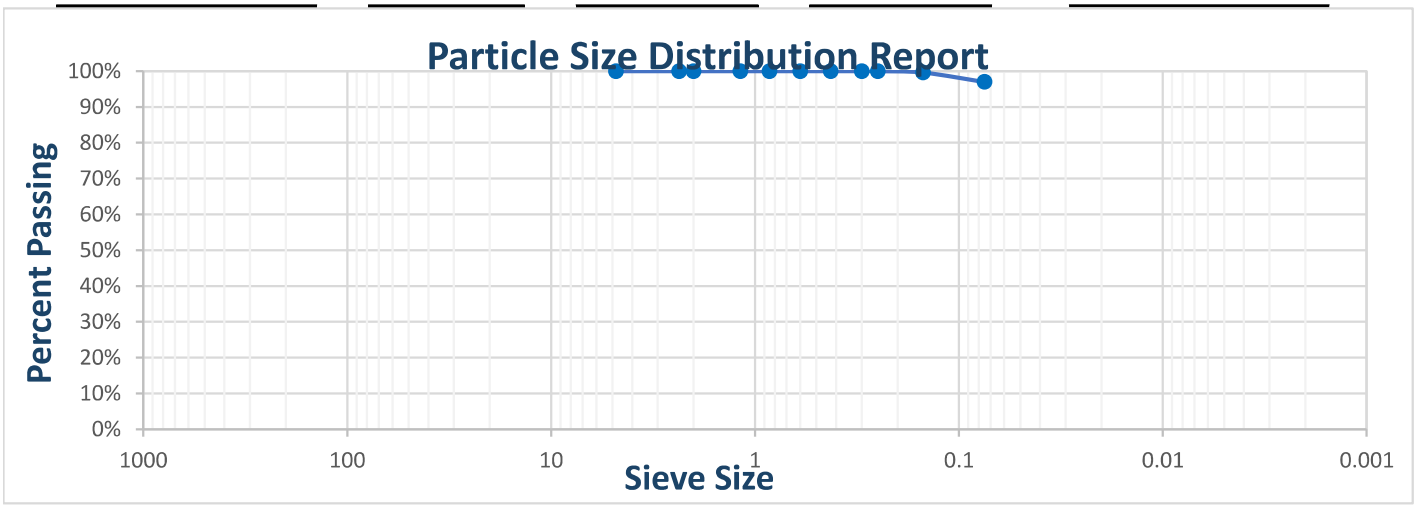
Classification USCS: CH - Fat Clay **AASHTO:** A-7

Test Results





Liquid Limit Method	Liquid Limit	Plastic Limit	Plastic Index	Material retained on #40 Sieve
Multi Point	90.00	36	54	0 %



Gravel		Sand			Silts and Clays
Coarse	Fine	Coarse	Medium	Fine	Passing the
3" to 3/4"	3/4" to #4	#4 to #10	#10 to #40	#40 to #200	#200
0.0%	0.0%	0.0%	0.0%	3.0%	97.0%

Performed By	Reviewed By	Reviewed Date
Dylan Campbell	**Alfred Frazier**	**8/11/2025**

Results relate only to items tested. Report shall not be reproduced, except in full, without prior written approval from UES.

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Montgomery, AL 36117

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Soil Classification Test

Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4318

Laboratory ID# 4620

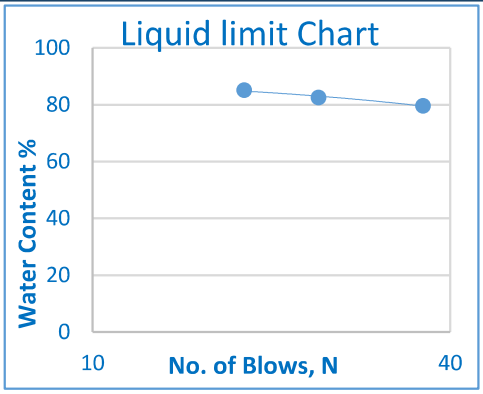
		Report Date:	08/11/2025
Project Name:	GEO-AIDT Fleet Maintenance Facility	**Project Number:**	A25114.00516.000
Client Name:	PH&J Architects, Inc.	**Sample Number:**	N/A
Location:	B-2	**Depth (ft):**	2.5-4

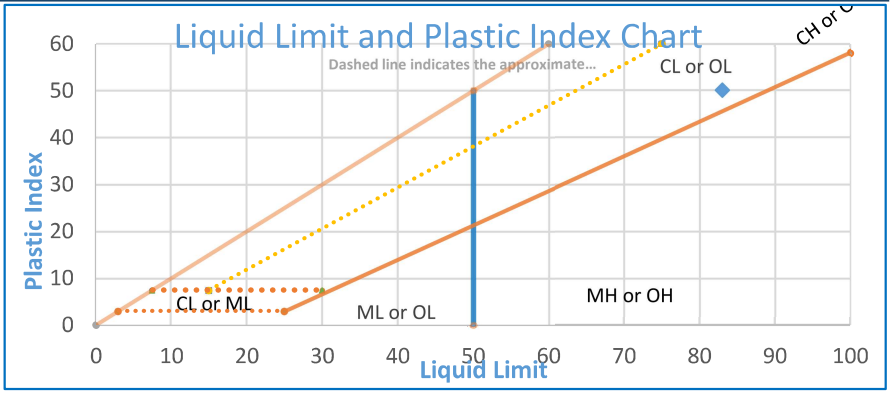
Material Classification

Material Color Description: Dark Gray **Moisture content:** N/A **Organic content:** N/A

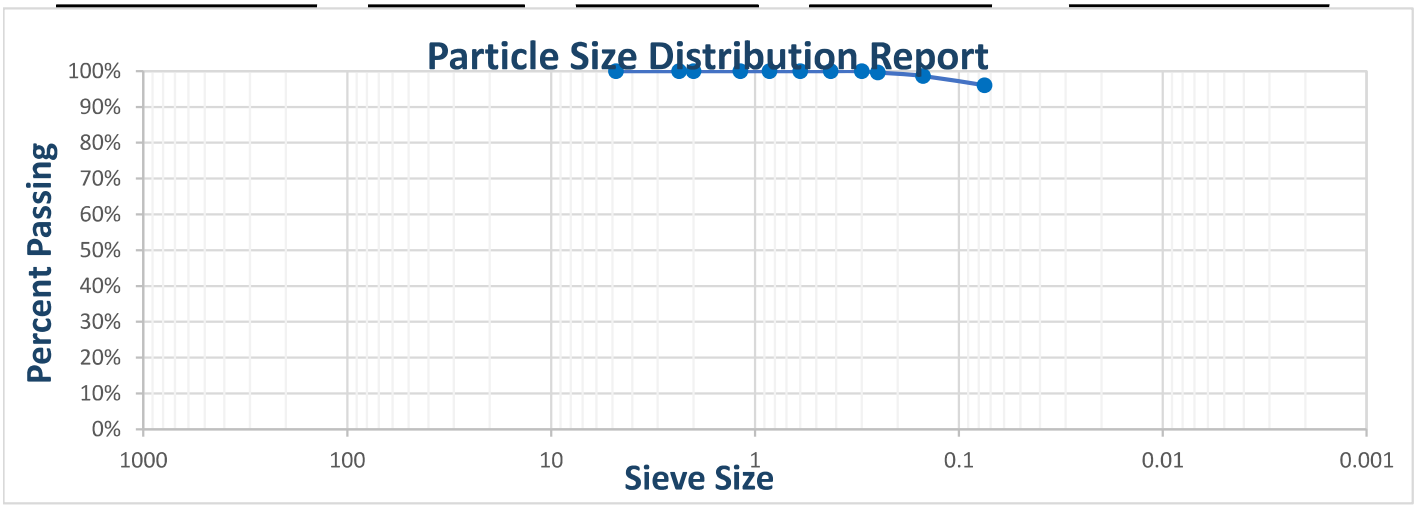
Classification USCS: CH - Fat Clay **AASHTO:** A-7

Test Results





Liquid Limit Method	Liquid Limit	Plastic Limit	Plastic Index	Material retained on #40 Sieve
Multi Point	83.00	33	50	0 %



Gravel		Sand			Silts and Clays
Coarse	Fine	Coarse	Medium	Fine	Passing the
3" to 3/4"	3/4" to #4	#4 to #10	#10 to #40	#40 to #200	#200
0.0%	0.0%	0.0%	0.0%	3.9%	96.1%

Performed By	Reviewed By	Reviewed Date
Dylan Campbell	**Alfred Frazier**	**8/11/2025**

Results relate only to items tested. Report shall not be reproduced, except in full, without prior written approval from UES.

INVESTIGATIVE FIELD PROCEDURES

Penetration Testing & Split Barrel Sampling: A standard 2.0" O.D. (1.4" I.D.) split barrel sampler is first seated 6" to penetrate any loose cuttings and then driven an additional 12" with blows of a 140-pound hammer falling 30". The number of blows required to drive the sampler the final foot is recorded and designated the “penetration resistance” (N). (ASTM D- 1586)

Soil Boring (SB): The test bore is advanced by a drilling rig utilizing 5-5/8" O.D. (2-1/4" I.D.) hollow stem augers. Soil samples are obtained with a standard split-tube sampler by driving the sampler thru the hollow auger. Collected soil specimens are sealed in air tight containers and delivered to the laboratory to confirm the drillers classifications. (ASTM D- 1452 & 1586)

Auger Boring (AB): Steel flight augers are utilized to advance the test bore. The soils are visually classified and sampled from the cuttings which are bought to the surface. (ASTM D-1452)

Undisturbed Sampling (UD): Relatively undisturbed soil samples are obtained by forcing a section of 3" O.D. 16-gauge steel tubing into the soil at the desired sample location. The tube is then sealed from moisture loss and delivered to the laboratory for possible laboratory testing.

Rotary-Wash Boring (RB): The drilling operation is performed by first setting a length of casing and then advancing the test bore by “jetting” a bentonite solution thru drill rods and bit.

Core Drilling (CD): The test bore is advanced thru rock by coring which utilizes a diamond bit and a double tube, swivel type core barrel. (ASTM D-2113)

Monitoring Wells (MW): Temporary or permanent wells may be installed to provide the accurate water table determination and periodic monitoring. The well is constructed with 1.5" to 4" diameter PVC pipe meeting current standards for monitoring well construction.

NOTES AND REFERENCES

Soil descriptions are based on the predominate constituent of the material and are further described by appropriate modifiers in reverse order of their importance. For example, a predominate sand soil containing clay would be described as “clayey sand”. Additional modifiers may be used, beginning with the least important constituent such as “silty clayey sand”, etc.

Water levels shown on the test boring logs reflect those levels measured at the specified time and date indicated on the logs. These water levels are subject to seasonal fluctuation and can be effected by local surface drainage and/or rainfall during the monitoring period.

The following table describes soil relative densities and consistencies based on penetration resistance values (N) determined by the Standard Penetration Test. The “N” values are estimated for hand tool bores using a portable dynamic cone penetrometer.

	N	Relative Density
	0 – 3	Very Loose
	4 – 9	Loose
Sand	10 – 19	Firm
	20 - 29	Very Firm
	30 - 49	Dense
	50+	Very Dense

	N	Consistency
	0 - 2	Very Soft
	3 - 5	Soft
	6 - 11	Firm
Clay and Silt	12 - 17	Stiff
	18 - 29	Very Stiff
	30 - 49	Hard
	50+	Very Hard

Laboratory Test References

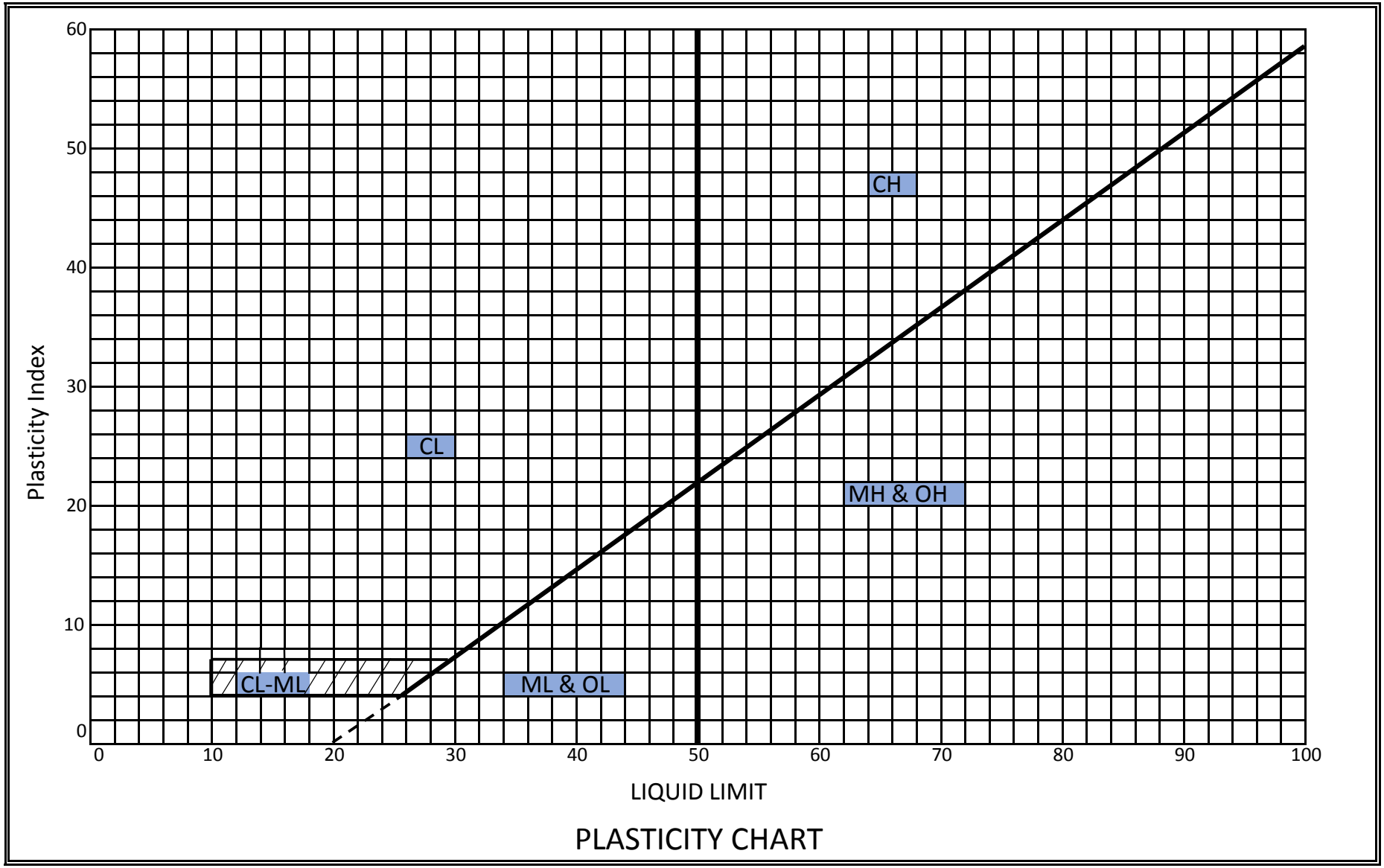
Test	**Reference**
Moisture Content	ASTM D-854
Particle Size Analysis	ASTM D-421,422,1140
Atterberg Limit	ASTM D-423, 424
Specific Gravity	ASTM D-2216
Compaction Test	ASTM D-698, 1557
California Bearing Ratio Test	AASHTO T-193
Triaxial Shear Test	ASTM D-2850
Unconfined Compression Test	ASTM D-2166
Consolidation Test	ASTM D-2435
Soil Permeability Test	ASTM D-2434

The Unified Soil Classification System

Major divisions			Group symbol		Typical names	Classification criteria for coarse-grained soils	
Coarse-grained soils (more than half of material is larger than No. 200)	Gravels (more than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines	$C_U \geq 4$ $1 \leq C_C \leq 3$	
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW ($C_U < 4$ or $1 > C_C > 3$)	
		Gravels with fines (appreciable amount of fines)	GM	d/u	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below A line or $I_P < 4$	Above A line with $4 < I_P < 7$ are borderline cases requiring use of dual symbols
			GC		Clayey gravels, gravel-sand-clay mixtures	Atterberg limits below A line with $I_P > 7$	
	Sands (more than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines	CU ≥ 6 $1 \leq C_C \leq 3$	
			SP		Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW ($C_U < 6$ or $1 > C_C > 3$)	
		Sands with fines (appreciable amount of fines)	SM	d/u	Silty sands, sand-silt mixtures	Atterberg limits below A line or $I_P < 4$	Limits plotting in hatched zone with $4 \leq I_P \leq 7$ are borderline cases requiring use of dual symbols
			SC		Clayey sands, sand-clay mixtures	Atterberg limits above A line with $I_P > 7$	
Fine-grained soils (more than half of material is smaller than No. 200)	Silts and clays (liquid limit < 50)		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	1. Determine percentages of sand and gravel from grain-size curve. 2. Depending on percentages of fines (fraction smalled than 200 sieve size), coarse-grained soils are classified as follows: Less than 5%-GW, GP, SW, SP More than 12%-GM, GC, SM, SC 5 to 12%-Borderline cases requiring dual symbols.	
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			OL		Organic silts and organic silty clays of low plasticity		
	Silts and clays (liquid limit > 50)		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			CH		Inorganic clays or high plasticity, fat clays		
			OH		Organic clays of medium to high plasticity, organic silts		
	Highly organic soils		Pt		Peat and other highly organic soils		

$$C_U = D_{60}/D_{10}$$

$$C_C = D^2_{30}/D_{10}D_{60}$$



PLASTICITY CHART

General Terms and Conditions

Binding Agreement. By accepting the Proposal Client accepts and agrees to be bound by all terms and conditions set forth in the Proposal and these General Terms and Conditions. The Proposal and these General Terms and Conditions (collectively, the "**Agreement**") comprise the entire agreement between UES Professional Solutions 18, LLC ("**UES**") and the Client and supersede all prior or contemporaneous understandings, agreements, and representations.

Scope of Services. UES shall provide the services (the "**Services**") set forth in the Proposal. UES shall not provide and is not responsible for the supervision or direction of the actual work of the contractor, or for site safety. The Client agrees that UES will not be expected to make exhaustive or continuous site visits beyond those established in the Proposal, but that construction observation appropriate for the construction stage shall be performed. It is understood that the Services provided by UES will not relieve the contractor of its duties and responsibilities for performing its work in accordance with the plans and specifications. UES will observe, test, document and alert the Client and/or its contractor, in a timely manner, when UES deems work pertinent to its Services is not being performed in accordance with the plans and specifications. The Services do not include investigation, detection, prevention, or assessment of biological pollutants such as molds, fungi, spores, bacteria or any of their byproducts. Full-time construction observation by UES employees does not mean that UES is observing all work by the contractor or all placement of all materials. Full-time construction observation means that an employee of UES has been assigned to the project for the time required to fulfill UES's contractual responsibilities.

Additional Services. If, during the performance of the Services, UES, its sole discretion, deems it necessary to perform services in addition to the Services (the "**Additional Services**") to successfully complete any evaluation or analysis contained in the Services, UES shall request in writing a modification of its Scope of Services, along with a description of the additional fees for the performance of such Additional Services. The Client may authorize such Additional Services in writing, which shall modify the terms of this Agreement. If the Client declines to modify the terms of this Agreement with respect to the Additional Services UES shall have the right to modify the Agreement to eliminate any evaluation or analysis that would require the Additional Services and to modify the fees to be charged to reflect the elimination of any evaluation or analysis, which modification shall be binding on the Client.

Schedule. The Client acknowledges that any schedule for the performance of the Services contained in the Proposal is an estimate of the time required for performance of the Services, and that the performance of the Services may not be complete prior to the expiration of the period or periods listed in such schedule. Any failure of UES to perform the Services within the time set forth in any schedule for performance shall not be considered a material breach of this Agreement.

Insurance. The Client represents and warrants that Client or the owner of the Property shall, as applicable, maintain one or more general liability, automobile and workman's compensation insurance policies providing coverage for injuries or damage incurred on the property (the "**Property**") at which the Services are to be performed in the amount of at least $1,000,000 per policy, per occurrence. The Client agrees to add UES as an additional insured for General Liability coverage. UES shall procure and maintain insurance coverage as it deems to be adequate. Certificates for such policies shall be provided to the owner upon request.

Entry onto Property. If the Client is the owner of the Property, the Client hereby authorizes UES to enter the Property for the purpose of performing the Services and the Client represents and warrants that the Client has full power and authority to permit UES personnel to enter and perform the Services on the Property, as may be required under the terms of this Agreement. If the Client is not the owner of the Property, the Client shall assist UES in obtaining permission from the Property's owner to access the Property and perform the Services. If such permission cannot be obtained, UES may, in its sole discretion, modify or cancel the Agreement. If UES determines it is necessary to enter onto property adjacent to the Property (the "**Adjacent Property**") to complete the performance of the Services, UES will contact the Client prior to making any entry onto any Adjacent Property to request that the Client obtain permission from the owner of the Adjacent Property, and from any other third party from whom permission may be required to allow UES to enter thereon. Upon receiving such a request, the Client shall assist UES in obtaining permission from the owner of the Adjacent Property. If such permission or authorization cannot be obtained, UES may, in its sole discretion, modify the Agreement to eliminate any Services that would require entry onto such Adjacent Property and such adjustments shall be binding on the Client.

Fees and Payment of Invoices. As consideration for the Services, the Client shall pay to UES for the costs and fees stated in the Proposal (the "**Fees**"). If the Client designates a third party to pay the Fees the Client shall remain liable for the full payment of the Fees. UES will submit invoices to the Client periodically. Unless otherwise stated on the Invoice or in the Proposal, invoices are due and payable within thirty (30) days from the invoice date. If the Client fails to make any payments due UES for the Services within thirty (30) days from invoice date, interest as permitted by Georgia law may be charged until the full amounts due are paid. If the Client fails to pay the amount due UES within thirty (30) days from UES's invoice date, UES may, in its sole discretion, suspend services being performed under this Agreement until UES has been paid in full all amounts due for the Services provided, expenses incurred and other related charges. Failure by the Client to pay UES prior to the due date of an invoice shall constitute a material breach of the Agreement. Payments received from the Client will be applied and credited first to interest then to principal. The Client will reimburse UES for all time spent and expenses (including attorneys' fees) incurred in connection with collecting any delinquent amounts.

Client's Responsibilities. In addition to the Client's obligations to pay for the Services performed under this Agreement and the Client's other obligations set forth in this Agreement, the Client agrees to assist and cooperate with UES in any manner necessary and within its ability to facilitate performance of the Services, supply UES with all information and documents in the Client's possession or knowledge that are relevant to the Services. The Client shall designate the location of all subsurface structures on plans to be furnished to UES such as pipes, tanks, cables and utilities within the property lines and shall be responsible for any damage inadvertently caused by UES to any such structure or utility not so designated.

Standards of Performance. The standard of care for all professional engineering and related services performed or furnished by UES under the Proposal and this Agreement will be the care and skill ordinarily used by members of the profession practicing under similar circumstances at the same time and in the same locality. The Client shall be responsible for, and UES may rely on, the accuracy and completeness of specifications, requirements, programs, instructions, reports, data, drawings, and other information furnished by the Client to UES pursuant to this Agreement. UES may use such specifications, requirements, programs, instructions, reports, data, drawings and information in performing or furnishing services under this Agreement. In the event necessary requirements or specifications are not provided before the Services commence, UES may set basic requirements for soil density tests and concrete sample fabrication that will be used until such time as they are provided.

Dispute Resolution; Litigaiton. As a condition precedent to filing any action in state or federal court concerning the Proposal or this Agreement, UES and the Client agree to negotiate all disputes between them arising out of or relating to the Proposal or the Agreement in good faith for a period of 30 days from the date of written notice of such dispute, regardless of the nature of the relief sought. If such negotiations between UES and the Client do not fully resolve the dispute, as a further condition precedent to filing any action in state or federal court, UES and Client shall mediate the dispute with a mutually acceptable alternative dispute resolution service. If said dispute is not fully resolved by said mediation, the dispute may then proceed in a state or federal court in Fulton County, Georgia unless an alternative venue is agreed upon by both UES and the Client. The prevailing party in any lawsuit filed by the parties concerning the Proposal or this Agreement shall be entitled to recover its costs and expenses incurred in such proceedings from the other party, including reasonable attorneys' fees, costs of court and expert witness costs. THE CLIENT IRREVOCABLY WAIVES ANY AND ALL RIGHT TO TRIAL BY JURY WITH RESPECT TO ANY LEGAL PROCEEDING ARISING OUT OF OR RELATED TO THE PROPOSAL OR THIS AGREEMENT. The Client acknowledges that it understands and has considered the implication of this waiver and makes this waiver voluntarily.

Use of Documents and Intellectual Property. Unless otherwise agreed in writing, all documents and information prepared by UES or obtained from a third party in connection with the performance of the Services are instruments of service (the "**Instruments of service**"), and UES shall retain ownership therein (including the right to reuse at the discretion of UES). All Instruments of Service are solely for use by the Client and will not be provided by the Client to any other person or entity without the prior written consent of UES. The Client has the right to reuse the Instruments of Service for purposes reasonably connected with the project for which the Services are provided, including without limitation design and licensing requirements of the project. No party other than the Client may rely on the Instruments of Service, and the Client will not represent to any other party that it may rely on the Instruments of Service without the express prior written consent of UES. The Client acknowledges that UES may employ or develop proprietary software, trade secrets, or other intellectual property in the performance of the Services (the "**Intellectual Property**"). The Client hereby agrees that it will not retain or acquire any ownership interest in the Intellectual Property and that all Intellectual Property employed or developed by UES in the course of the performance of the Services shall remain the property of UES or a third party, as applicable.

Term of Agreement. This Agreement shall begin on the date of execution as set forth on the Proposal and shall continue until the completion of all obligations of the parties under this Agreement, mutual written agreement of the parties, termination for material breach of this Agreement, or termination by UES for convenience. UES shall have the right, in the event of a material breach by the Client to terminate this Agreement. Said termination shall be effective immediately upon delivery by UES to the Client of a written termination notice or on such other later date as may be specified in any such notice of termination. UES may also terminate this Agreement for convenience upon thirty (30) days' written notice to the Client. If UES commits a material breach of this Agreement, the Client may terminate this Agreement upon thirty (30) days written notice to UES, provided the breach remains uncured at the end of such thirty (30) day period.

Indemnification. The Client agrees to defend, indemnify and hold UES and its agents, employees, owners, insurers and fiduciaries (the "**UES Indemnified Parties**") harmless for any costs, liabilities, claims, expenses, or damages incurred by the UES Indemnified Parties arising, directly or indirectly, from the provision of the Services by UES to the Client, including, but not limited to, any costs, liabilities, claims, expenses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising from the following: (a) any injury incurred by any UES employee or other personnel in the course of performing the Services; (b) any out-of-pocket cost or expense incurred by UES payable to any third party arising exclusively from the performance of the Services, other than the costs and expenses payable to UES personnel as compensation; (c) entry onto the Property or any Adjacent Property by UES after the Client has represented to UES that UES is duly authorized to enter such Property or Adjacent Property; and (d) any misrepresentation or breach of any warranty set forth in this Agreement by the Client.

Limitation of Liability. Notwithstanding any other term or provision in the Proposal and the Agreement, in recognition of the relative risks, rewards and benefits of the work being performed by UES to both the Client and UES, the risks have been allocated such that the Client agrees and acknowledged that, to the fullest extent permitted by Georgia law, the total liability of UES to the Client for any and all injuries, claims, losses, expenses, damages or claim expenses arising out of the Proposal and the Agreement from any cause or causes of action whatsoever, whether arising out of contract, negligence, strict liability in tort, or warranty, shall not exceed any amounts paid by the Client for the Services relating to the event giving rise to the liability; provided, however, that, in the event such claims are attributable to gross negligence or intentional misconduct of UES, the limit of liability will be increased to the greater of $50,000 or the amount paid by the Client for the Services relating to the event giving rise to the liability, less any applicable insurance amount covering alleged damages or claims. No action, regardless of form, arising from or pertaining to this Agreement or the Services may be brought by the Client more than one (1) year after such action has accrued, and neither UES nor any officer, director, manager, employee, or agent of UES shall have any liability under this Agreement for consequential, exemplary, or incidental damages, including, without limitation, damages for loss of goodwill, losses due to delay or work stoppage, and any and all business or commercial damages or losses.

Disclaimer of Warranties. UES DOES NOT MAKE ANY WARRANTY, WHETHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE SERVICES PROVIDED HEREUNDER, AND ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE ARE HEREBY EXPRESSLY EXCLUDED.

No Third-Party Beneficiary. The provisions of this Agreement are and will be for the benefit of the parties to the Agreement only and are not for the benefit of any third party, and accordingly, no third party shall have the right to enforce the provisions of this Agreement.

Force Majeure. UES shall not be liable or responsible to the Client, nor be deemed to have defaulted or breached this Agreement, for any failure or delay in fulfilling or performing any term of this Agreement if such failure or delay is caused by or results from acts or circumstances beyond the reasonable control of UES including, without limitation, acts of God, flood, fire, earthquake, explosion, governmental actions, civil unrest, national emergency, or labor disputes; provided, however, that, if the event in question continues for a continuous period in excess of thirty (30) days, the Client shall be entitled to give notice in writing to UES to terminate this Agreement.

Disposal of Samples. UES may dispose of all stored soil, rock, and asphalt samples 60 or more days after submission of the final report covering those samples. UES may dispose of stormwater samples immediately upon testing.

Successors, Assigns, and Beneficiaries. The Client and UES each are hereby bound and the partners, successors, executors, administrators and legal representatives of the Client and UES are hereby bound to the other party to this Agreement and to the partners, successors, executors, administrators and legal representatives (and said assigns) of such other party, in respect of all covenants, agreements and obligations of the Agreement.

Miscellaneous. The following other terms and conditions shall also govern this Agreement: (a) all representations, agreements to reimburse, defend, hold harmless or indemnify, dispute resolution provisions, and covenants or agreements that contemplate performance after completion of and/or payment for the Services in this Agreement shall survive any completion or termination of this Agreement; (b) the Agreement shall be construed and interpreted under and shall be governed by and enforced according to the substantive laws of Georgia, without regard to choice of law rules; (c) this Agreement may not be modified, changed or supplemented, nor may any obligations in this Agreement be waived, except by a written document signed by the party to be charged or by such party's agent duly authorized in writing; (d) no waiver of a breach of any of the terms, covenants or conditions of this Agreement will be construed or held to be a waiver of any succeeding or preceding breach of the same or any other term, covenant or condition herein contained; (e) the failure of either party to insist upon strict performance of any of the provisions of this Agreement shall in no way constitute a waiver of its rights, at law or in equity, or a waiver of any other provisions of this Agreement or subsequent default by the other party in the performance of or compliance with any of the terms and conditions set forth in this Agreement; (f) the parties to this Agreement agree that both have had the opportunity to review and negotiate the terms of this Agreement and to obtain the assistance of counsel in reviewing and negotiating such terms prior to execution, and that this Agreement shall be construed neither against nor in favor of either party but shall be construed in a neutral manner; (g) all notices and other communications shall be in writing and shall be deemed properly delivered, received, given and served: (i) on the same day as personally delivered; (ii) when delivered if deposited in the United States mail, certified or registered, postage prepaid, return receipt requested; (iii) when delivered by Federal Express or other comparable courier service, charges prepaid and any delivery failure caused by a party's failure to give notice of change of address or refusal to accept delivery shall be deemed receipt of notice; and (h) the parties acknowledge that each will have access to the others' proprietary information and pledge to one another to use the same solely for the purpose of furthering the performance of this Agreement, and upon the termination thereof, to maintain and protect the confidentiality of the same forevermore as though it was their own.

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SECTION 0101

BASE BID, ALTERNATES, ALLOWANCES, ETC.

A. BASE BID SUMMARY

1. **Scope**: Base Bid shall be for a single contract for work complete as indicated on the Drawings and as specified herein, except as specifically excluded. The Contractor shall execute the work in accordance with the true intent of the Contract Documents, which is to effect a complete, coordinated, operational, useable, first-class job without additional cost to the Owner, whether or not each and every item necessary therefor is specifically mentioned. Omissions, misdescriptions, and conflicts in or between specifications and drawings (and not clarified prior to bidding) will not relieve the Contractor from performing any work necessary to such completion.

   The General and other Conditions and all other Contract Documents are applicable to all work under all Divisions of the Specifications. GLM!

2. **General Description**: Base bid work includes construction of approximately 3,100 sf of new building space and related site work and shelled office area, with all trades incorporated in the General Contract.

3. **Abbreviations and Symbols**: Abbreviations employed are bound herein Project Manual. Symbols employed are noted by legend on drawings.

B. ALTERNATES

State in proposal the amount to be added to, or deducted from, the Base Bid for each of the alternates described below. Upon execution of Agreement, implement work and modify work as established under various alternates as accepted or rejected by Owner.

Note: Compute each Alternate as a change from the conditions established by all previous alternates; if alternates are accepted out of the order listed, contract price will be adjusted as required.

Alternate No. 1 (Wash Slab): Provide a price for the installation of the concrete wash slab as shown in the documents at the Loading Dock with all trades included.

Alternate No. 2 (Office Wing Fit-out): Provide a price for the fit-out of the office wing as shown in the documents with all trades included

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C. ALLOWANCES (see GC Article 43)

1. **General**: Unless stated otherwise, allowances for materials include cost of delivery to job site with all applicable sales tax paid. Costs related to job storage, uncrating, installation and contractor's profit and overhead are not included and shall be adequately covered otherwise in the Contract Sum. Items included hereunder shall be selected by the Architect or Owner, purchased by the Contractor, and included under the general warranty (unless the Contractor makes reasonable objections to warranty in writing prior to purchase).

   Sub-contracts involving labor contracted under the allowance need not be included under the general warranty.

   No order for work covered by an allowance may be placed by the Contractor until the accounting therefore has been submitted in writing and approved. Contractor must use the Allowance Authorization Form herein for each allowance to be processed.

2. **Owner's Contengency Allowance**: Include in Bid a lump sum cash allowance of **$45,000.00** for Owner's Contingency.

D. UNIT PRICES

1. **General**: Include under each unit price requested all overhead, profit and other related costs associated with the item. Upon request, supply an accounting of the unit price proposed, indicating the computation of labor and material costs, overhead and profit. Markups for profit must not exceed any restrictions stated in General or Supplementary Conditions. Bid Proposals bearing unit prices which are obviously excessive and not justifiable, may be rejected.

2. **Prices Requested**: Supply unit prices listed on Proposal Form. Refer to individual Sections for detailed description of special unit prices required

End of Section

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SECTION 0104

COORDINATION, ADMINISTRATION & ENGINEERING

A. LAYOUT

1. **Lines and Levels**: Provide competent engineering services to establish and maintain lines and levels as indicated. Verify site conditions; report any discrepancies encountered. Establish and maintain benchmarks at two widely separated points until completion of work.

   The overall structure and each component thereof shall be constructed accurately within the tolerance set forth in the ACI manual of standard practice, and to such greater accuracy as will enable the parts to fit together properly, produce neat uniform joints, etc.

2. **Approval of Layout**: Secure before proceeding with excavation or cutting of trees.

3. **Sanitary Sewer**: Before floor level is irrevocably established, verify and establish location of sanitary sewer outfall. Report any difficulty encountered.

4. **Line Locators**: Before allowing any trade to proceed with excavation or trenching, arrange with various utility companies and Owners B & G Dept. to visit site, describe and mark any and all of their systems which might be damaged by construction operations.

B. GENERAL COORDINATION, PHASING & PARTIAL OCCUPANCY

1. **General Coordination**: Unless expressly specified to the contrary, all items in all Divisions of the Specifications or on the Drawings shall be supplied in place, complete and operational, by the Contractor, who shall provide and coordinate the work of all trades. Coordinate and make minor adjustments in layout of the various systems to be installed, one with another, and with existing utilities, structural elements, etc., so as to avoid conflicts and produce workable systems, applications and appearance consistent with the intent of the design. Such coordination shall include, but is not limited to, anchors, continuity of insulation, membranes, fire barriers, and flashings, door pockets, equipment layouts, juncture of finishes, above ceiling work, voltages, shaft sizes, blocking, and nailers, block-outs, etc.

2. **Coordination With Owner**: Hold interruption of all utility services to the minimum necessary, at times of minimum load, and when agreed to by Owner. Give adequate advance notice. Schedule with the Owner work required within areas in use, and so as to reduce the disturbance and interruption to the minimum practical. Take care to avoid tracking in dirt; hold noise to the minimum; do not allow debris to accumulate.

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3. **Use and Custody of Premises**: Confine apparatus and operations to limit defined by the Owner and make all reasonable efforts to avoid interfering with activities normally carried on at the site. Enforce the Owner's instructions regarding signs, fires, parking, smoking, etc. Avoid core drilling of floor during business hours unless Owner agrees technique does not disturb building occupants. Utilize the site for no purpose other than to support the contracted construction operations.

   Permit no blasting or any operation resulting in excessive or detrimental vibration.
   Provide space for test lab (see Section 0140) to conduct on-site operations.

4. **Structural Sequence**: Remove forms, backfill, load slabs, provide braces, make connections and otherwise conduct operations so that the design strength of members is reached before load is applied thereto.

5. **Juncture of Different Floor Finishes**: Note that the actual "finish floor elevation" will occur slightly higher than elevation noted on architectural/civil/structural drawings (which are top-of-slab). Adjust setting beds, elevator sills, etc. such that all floor finishes (i.e. hard and soft tile, stone, carpet, etc.) will butt together with top surface level. Normally assume that carpet will compact ⅛ inch. Employ leveling compound to make slight adjustments. Employ beveled edge strips only at carpet/soft tile intersections, and where carpet, soft tile or thin-set hard tile terminates at exposed concrete.

6. **Attic Stock**: Do not deliver "attic stock" material (as identified in Section 0160 and in various other Sections) until a Basement storage room is completed and placed under the exclusive control (i.e. lock & key) of the Owner. Execute with the Owner a partial acceptance of such space and a "use and occupancy waiver" to maintain insurance coverage.

7. **Quality Control**: Coordinate activities of and cooperate with the various testing agencies as noted in various Sections and otherwise as required to successfully accomplish the necessary tests. See Section 0140.

C. USE OF PUBLIC AREAS

1. **City Regulations**: Adhere to city instructions regarding traffic flow, protecting curbs and utilities, keeping streets clean, etc. Conduct regularly scheduled clean-up operations in adjacent streets to insure that surfaces are kept clean. See Section 0150.

D. ADMINISTRATION

1. **Pre-Construction Conference**: Within two weeks after the date of commencement, a pre-construction conference will be held at the job site. At this time the duties and responsibilities of the Architect, Owner, Contractor, Independent Test Lab (Special Inspectors) and public authorities will be discussed, together with applicable forms and procedures. The Contractor's Executive-in-Charge, Project Manager and Field Superintendent shall attend.

2. **Progress Meetings**: In the event the Contractor's progress falls behind the approved schedule, he shall implement bi-weekly meetings during which job progress is reviewed, problems are identified and remedies sought, schedules adjusted and new goals set. The Contractor's senior project manager, the site staff and all major subs operating, and the Architect's representative shall attend.

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3. **Pre-Pouring Conference**: Before pouring concrete, the Contractor shall arrange a pre-pour job site conference to be attended by the job superintendent, his forming foreman, lab personnel, ready-mix supplier, the Architect's field representative. All aspects of forming, concreting, finishing, curing and testing work shall be discussed.

4. **Pre-Roofing Conference**: A pre-work conference is required before any roofing materials are installed. This conference shall be conducted by a representative of the Architect and attended by representatives of the Division of Construction Management Inspector, the General Contractor, the Roofing Contractor, the Sheet Metal Contractor, and the roofing and roof deck manufacturers. If equipment of substantial size is to be placed on the roof, the roof-top equipment contractor must also attend this meeting.

   The pre-work conference is intended to clarify demolition (for renovation or reroofing projects) and application requirements and what work should be completed before roofing operations can begin. This would include a detailed review of the Architect's specifications, the roof plans, roof decking, flashing details, and approved shop drawings, submittal data and samples. Any conflict between the architectural specifications and the manufacturer's specification must be resolved. If this pre-work conference cannot be satisfactorily concluded without further inspection and investigation by any of the parties present, it shall be reconvened at the earliest possible time to avoid delay of the work. In no case should the work proceed without inspection of all roof deck areas and substantial agreement on all points.

   The following goals are to be accomplished during the conference:

   a. Review all Factory Mutual and Underwriters Laboratories requirements listed in the specifications and resolve any questions or conflicts that may arise.
   b. Establish trade-related job schedules, including the installation of roof-mounted mechanical equipment.
   c. Establish roofing schedule and work methods that will prevent roof damage.
   d. Require that all roof penetrations and walls be in place prior to installing the roof.
   e. Establish those areas on the job site that will be designated as work and storage areas for roofing operations.
   f. Establish weather and working temperature conditions to which all parties must agree.
   g. Establish acceptable methods of protecting the finished roof if any trades must travel across or work on or above areas of the finished roof.

   The Architect will prepare a written report indicating actions taken and decisions made at this pre-work conference. This report will be made a part of the job record and copies will be forwarded to the General Contractor, the Owner, the Division of Construction Management and the Division of Construction Management Inspector.

   The pre-work conference is intended to amplify the specifications as to the desired results of the final applications of the coating and to discuss the compatibilities of the products with the respective substrates.

5. **Subsequent Conferences**: To be held as the need arises and attended by all parties involved in the subject of the conference.

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6. **Requests for Information**: A formal RFI system is encouraged, and such requests will be answered promptly by the Architect. However, RFI responses cannot change the contract scope, and the Contractor shall immediately notify the Architect in writing if he feels the response requires work beyond his contract. The Contractor has a duty to examine all construction documents before sending an RFI to ascertain if the answer is contained therein, is obvious, or if the question has already been addressed. Frivolous RFI's, or RFI's generated only to build a pseudo case will be so identified and returned.

   All RFI's shall be forwarded through the general contractor, one subject per RFI, numbered sequentially. One set complete with response shall be maintained at the job site along with a log and subject index.

End of Section

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SECTION 0112

WORK GENERALLY

A. GENERAL

1. **Existing Conditions**: Drawings reflect approximate existing conditions.

   Minor discrepancies will not relieve the Contractor from completing the work in accordance with the intent set forth. Except as indicated otherwise, new work shall line with, match and work out with existing.

2. **Fire Protection**: During construction, continuously maintain all existing fire exits and fire protection systems unless other measures of equivalent safety are taken.

B. CUTTING, RESTORATION & PATCHING

1. **General**: It is the intention of these specifications that all required items be built into new work such that cutting and patching is not required. The Contractor shall coordinate the work of all trades to achieve this end.

   Where work is to be installed in the existing work to remain, the installation shall be made in the neatest practical manner which causes the least damage to the structure and to the finished surfaces, and which will produce the neatest result.

2. **Scope**: Patch all surfaces (interior and exterior) with matching materials (matching existing in all respects) where damaged by construction work, where new devices are installed in or on surface and where existing defects become permanently exposed as a result of operations.

   Refer to mechanical, plumbing and electrical drawings for additional work which will require patching, painting, etc.

3. **Survey**: Where damage is caused to existing lawns, shrubbery, walks, paving, utilities, mechanical and electrical systems, etc. restore to as good a condition as existed before work was begun. Report any defect of existing work that is to be altered or extended. Before work is started in any area, conduct a thorough survey with the Architect and the Owner and furnish a report listing all defects of any types which are not otherwise required to be corrected.

4. **Patching**: Where cut edges of existing concrete work will be exposed in finished work, carefully patch to true line with epoxy grout or non-shrink patching mortar.

5. **Temporary Shoring**: Provide any and all temporary shoring, bracing, cribbing or underpinning as may be necessary to protect the adjoining structure, sidewalks, HVAC pads, during operations.

6. **Plumbing and Electrical Work**: In any case wherein a plumbing line, or an electrical conduit or line is encountered, the Contractor shall examine the entire line and ascertain the impact of the new work upon it. If said line must be adjusted or rerouted and was not shown nor reasonably foreseeable in a prebid examination of the site, the Contract sum will be adjusted.

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7. **Asbestos Contamination**: In the event that existing asbestos insulation, fireproofing, flashings, ceilings, etc. are encountered and must be disturbed as a result of this work, the Contractor shall cease operations in that area and immediately notify the Owner and Architect in writing. The Owner will remove the material under separate contract. The Owner will have this work performed in a timely manner, after completion of which the Contractor may resume work in this area. The Contractor shall work around the problem area to the maximum practical extent to avoid overall delay.

End of Section

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SECTION 0130

SUBMITTALS

A. MISCELLANEOUS REQUIREMENTS

1. **Brand Names**: Submit for review a list of manufacturers and brand name materials proposed for each product identified under each Section before any work under that Section is begun.

2. **Progress Schedule**: Submit and maintain as indicated under Art. 12 of General Conditions. Follow procedures outlined in State Division of Construction Management MANUAL OF PROCEDURES. Revise and resubmit after each granting of a time extension and at any time that a delay from any cause will require adjustment of critical path operations. Refer to phasing requirements in Section 0104.

3. **Schedule of Submittals**: Submit for approval and keep current a schedule of submittals which is coordinated with the progress schedule and allows the Architect reasonable review time.

4. **Schedule of Values**: Submit as indicated under General and Supplementary Conditions.

5. **List of Subcontractors**: Supplement the list of subcontractors required in the Instruction to Bidders to the extent required by the Architect. Replace those names which are found to be unqualified.

6. **Evidence of Insurance**: Attach to the Contract as required by State Law. See Supplementary Conditions.

7. **Progress Reports**: The Contractor shall provide for job progress meetings, various reports that demonstrate the progress of the work. Among these reports shall be an action item report, job manpower summary, test log, concrete log, concrete order log, rebar delivery schedule, RFI log, change log, and submittal/transmittal report.

8. **Closeout Submittals**: See Section 0170.

B. SHOP DRAWINGS, SAMPLES & PRODUCT DATA (Amplification of GC Article 9 & 10)

1. **General**: Submit for review and approval as required in detail specifications and as otherwise requested. Indicate name of the supplier, fabricator, etc., who has prepared the submittal. Forward only after affixing general contractor's signature of approval thereto; otherwise material will be returned disapproved/resubmit. Contractor's approval stamp must state that the item(s) complies with specification criteria, and has been checked and coordinated with all parts of the Work. Revise and resubmit until Architect's approval and release is secured.

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Architect will review submittals for design only, and will assume no responsibility for dimensions, quantities or erection procedures indicated. Contractor's responsibility for indicated deviations from contract requirements will not be relieved by Architect's review, unless the deviation is specifically noted in the letter of transmittal, and express written approval is returned. Review of a separate item will not constitute review of an assembly in which the item functions. Submit data on all related items simultaneously so as to facilitate logical review of the material. Do not submit shop drawings for products or assemblies for which no such submittal was specified or requested in writing.

Do not commence work under any Section until all items in that Section are released. One copy of each submittal bearing the final review stamp of Architect shall be kept at the project office and shall be maintained in good condition. No submittal other than those stamped "Approved and Released" shall be on the job for any purpose. Submittals shall be submitted to the Architect by the third (3rd) pay request. Any submittals not made by then shall be as specified. The review time for the Architect is a minimum of 14 working days.

2. **Mechanical/Electrical Submittals**: Submittals in connection with mechanical and electrical work may be submitted to Architect's engineering consultant with a copy of letter of transmittal to the Architect. Submit all other material to the Architect.

3. **Structural Submittals**: Submittals showing only concrete rebars may be sent direct to the Architect's engineering consultant, with a copy of the transmittal to the Architect. Submit all other material direct to the Architect.

   Fabrication of structural load-bearing members shall be preformed by fabricators approved pursuant to IBC Section 1704.2.2, and the approval status shall be reflected on the submittal.

4. **Samples**: Where required, submit two of each item clearly labeled as to manufacturer, quality and job. The Architect will retain one sample for comparison with bulk shipments, and he may procure certain test samples from stock piles at the job site. Failure of any item to meet specified requirements will be cause to reject for use under this contract any further materials of the same brand or make. Rejected material already incorporated shall be subject to removal and replacement, or at the Owner's option may be left in place and the Contract price adjusted.

5. **Finish/Color Selection**: Unless the precise finish, color and pattern is specified, wherever a choice exists, submit accurate color and pattern charts for selection. Submit color chips and samples for all items well in advance of the need for the first selection (not later than 45 days after award. With very minor exceptions no color selections will be made until samples for all items requiring selection have been submitted.

   Do not submit color charts via electronic means, the Architect will not select colors from this format.

6. **Product Data**: Submit 1 copy of product data to the Architect's office via email. The Architect shall return via email the final marked-up/reviewed product data. Email address will be given during the pre-construction meeting.

   Product data shall be modified to show the data which is applicable to this project.

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7. **Shop Drawings:** May be submitted to the Architect via email (except for structural, fire alarm and fire protection as listed above). Email shall be sent to the Architect's field representative. The Architect shall return via email the final marked-up/reviewed submittal.

   Cross reference numbers assigned to shop drawing details with number of related detail on contract drawings and to applicable specification section paragraph numbers.

   Shop drawings shall faithfully and accurately develop, extend and coordinate the architectural, structural, mechanical (and other) details, specification and notes, so as to facilitate production of a complete, sound, operational job with all parts carefully fitted together. They shall illustrate coordination of related trades and parts; actual job measurements of constructed levels, angles and dimensions; work out similar and extended conditions; develop returns of finish work at corners and offsets; define selected options where such choice is allowed; reflect materials; and facilitate shop fabrication and job erection. Where anchors and connections are not stated in the contract, they shall indicate connections that are appropriate and engineered for the condition.

8. **Electronic Files:** In the spirit of partners in construction, and as a non-contractual convenience, computer disks of basic floor plans (if available) will be provided to the contractor for his sub-contractors for their use in preparing shop drawings. Request for such files shall be made in writing and incorporate agreement that use thereof does not void the Architects' copyright ownership, that the format will be "as generated", that no warranty of the fitness nor accuracy of the drawing will be made, that transfer will not be deemed a sale, that use will be limited solely to production of shop drawings for this particular project, and that such use of the file will be totally at the recipient's risk. File format will be PDF and architect's seals and title blocks will be removed from the files.

9. **Architects Transmittal**: As a convenience to the Contractor, the Architect's transmittal form will be in composite list form, with the current status of all submittals reflected. The Contractor's attention is called thereto.

End of Section

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SECTION 0140

QUALITY CONTROL

A. GENERAL (Amplification of GC Article 6)

1. **Contractor's Control Systems**: The Contractor shall establish a system of inspection and tests of his work and that of his subcontractors to insure that all applicable requirements of the drawings and specifications are met. He shall be diligent to insure that the quality of workmanship is satisfactory, that dimensional requirements are met, that defective materials are not used and that all required control and laboratory testing procedures (as stipulated under various divisions of the specifications) are effected. Where specific testing procedures are not stipulated, he shall establish and conduct a procedure to insure adherence to specified quality. He shall make an initial inspection of each phase of work as soon as a representative portion has been completed, and he shall make daily follow-up inspections, to insure that an acceptable quality of work is established and maintained.

   Where repetitive operations occur, he shall erect representative portions in advance of main installation to insure that quality is met, and that all parts fit together properly.

   No program of testing (lab test or control test) set out hereinafter will relieve the Contractor of his responsibility to meet specified quality standards. Such tests in no way limit the Contractor from ordering or making such additional tests as he deems necessary to insure contract compliance.

2. **Contractor's Control Testing**: To be performed by the Contractor and/or subcontractors at the site as specified under respective Sections. Submit a written record of each test indicating the date, location, result, etc. Except as approved, conduct all control tests in the Architect's presence.

3. **Code Tests**: Inspection and tests required by codes or ordinances shall be the responsibility of the Contractor, except as otherwise provided, and except as mandated by Chapter 17 of the IBC.

B. LABORATORY TESTING AND OBSERVATIONS GENERALLY

1. **Scope**: Tests or related activity by an independent laboratory, geotechnical consultant or agency shall be made as specified, pursuant to Chapter 17 of the IBC, and/or upon any reasonable indication that portions of the work fail to meet specifications.

2. **Lab Selection**: The Owner and Architect will jointly select a qualified test lab or agency which meets Section 1703 of the IBC, and to which the Contractor has no reasonable objection.

3. **Coordination**: The Contractor shall implement and coordinate the testing programs by providing pertinent extracts of specifications, by facilitating tests, by giving ample notice to the lab and (where specified) by taking field samples, shipping specimens, uncovering work, etc. as noted in individual Sections. The Contractor shall also notify Architect when laboratory personnel are required to visit site to secure specimens.

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4. **Cost**: Except as otherwise stated the cost of sampling and testing will be divided as follows:

   - Owner shall pay laboratory fees for stipulated tests and procedures (including those mandated by IBC Chapter 17).
   - Contractor shall pay for testing or retesting caused by apparent failure to meet specifications.
   - Contractor shall furnish without extra cost, including molds, field curing packing and delivery charges, all samples required for testing purposes.
   - Contractor shall pay for mix design service.
   - Contractor shall pay for tests required by code or ordinance and not otherwise specified.
   - Contractor shall be responsible for shop and plant test reports required of fabricators and manufacturers.
   - Contractor shall pay cost of special inspections mandated by code for non-approved shop fabricators (see IBC Article 1704.2.2).

C. TESTING & OBSERVATIONS MANDATED BY IBC CHAPTER 17

1. **Reports & Authority**: Results of specified tests and observations shall be forwarded directly to the Architect, to the Owner's Representative, and the Contractor as soon as practical. Any discrepancies noted will be brought to the immediate attention of the Contractor and the Architect. Reports to Building Officials will be forwarded at intervals acceptable to these officials.

   Test lab personnel will have no authority to order work or accept changes to mitigate deficiencies or to accommodate conditions that might be encountered.

2. **Stipulated Tests & Procedures**: Required tests and observations are described under the Specification Section related thereto and under Chapter 17 of the IBC. Among others, test procedures and observations are included under the following Sections:

   - Earthwork*
   - Concrete, Reinforcing Steel*
   - Mechanical*
   - Electrical

   *These Sections also include lab tests which do not fall under purview of Chapter 17, see Part D below

End of Section

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SECTION 0150

TEMPORARY FACILITIES

A. TEMPORARY FACILITIES (Additions to GC Articles 6, 13, 16, 46, 48)

1. **Safety Precautions**: Provide and assume complete responsibility for such safety programs and facilities as will adequately protect workmen, the public and others who may be about the site.

   See Section 0112 for supplemental requirements within occupied structures.

2. **Field Office**: Provide complete with telephone and adequate layout space. Make facilities available to Architect during entire construction period.

3. **Facilitate Observation**: Provide all necessary facilities to permit observation of work by the Architect, public officials, and the Owner's representatives. Such facilities shall include temporary lights, hard hats, ladders, platforms, railings, etc. all safe and suitable for use by office personnel.

4. **Temporary Toilets**: Provide portable chemical toilets acceptable to local health authorities. Do not permit use of permanent fixtures in building.

5. **Temporary Doors or Fixed Panels**: Install to prevent vandalism, protect people, protect the work, and to control temperature and humidity.

6. **Temporary Lights**: Install exterior lights to protect job against vandalism, and lights in interior spaces to facilitate conduct and observation of work.

7. **Temporary Heat**: Provide as necessary for protection and drying-out of work and to facilitate cold weather operations. Such heat shall be of type which will not damage finish work. Permanent heating apparatus may be used upon approval, but only after dust generating operations are completed.

8. **Protection of Trees, etc**.: Protect all trees, shrubs, etc. on project site which are shown to remain. Box trunks and plants within 25 feet of any construction activity. Do not permit heavy equipment or stockpiles within branch spread. Refer also to Division 2.

   Where adjacent lawns and surfaces are damaged as a result of building operations, restore to original grades and conditions.

9. **Rodent Control**: Provide ample suitable containers with covers to receive rodent or vermin attracting refuse. Insure that such refuse is contained and removed from site at regular intervals.

10. **Temporary Wiring**: Provide single phase 3-wire, 110–220-volt service with multiple weatherproof sockets for use by all trades at points within reasonable reach from all areas of work. Outlets shall meet NEC.

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11. **Power, Oil, Gas, etc.** Provide as required for construction, heating, testing and fire protection. Pay cost of permanent service of same until acceptance of project or full occupancy by Owner, whichever is earlier.

    Oil and gasoline required for testing and special power for welding shall be furnished by Contractor.

12. **Water**: Will be furnished by the Owner insofar as same now exists at the site; Contractor shall pay cost of temporary extension of service to area of work, and shall insure that excessive utility cost are not incurred.

13. **Cleanup**: To the maximum practical extent, keep the building and surrounding area clean, free of debris and in an orderly condition at all times. Control dust. Keep weeds cut. Avoid accumulations of combustible materials within the structure.

14. **Access to Work**: Protect crossings of curbs, walks and pavements with planking or earth. Repair any damage that may inadvertently be done.

    Construct temporary drive as indicated on drawings and limit access to that route so as to minimize interference with existing activities. Use of existing drive shall be limited to work on kitchen wing and on existing boiler room. Provide dust control service for temporary drives.

    Where new equipment or material cannot be set in place through new (or existing) openings, provide temporary openings as required. Patch and repair damage caused by such openings.

15. **Project Sign**: Construct per detail bound herein; with wording and at location as directed. Maintain in good condition for duration of project. No other signs except safety warnings (see GC Article 51) and delivery instructions will be permitted.

16. **Construction Fence**: Provide as required to confine construction activities. Near completion of work, remove fence and all evidence thereof.

17. **ADA Access**: Provide temporary facilities to substitute for any and all ADA facilities (H/C access, parking, signs, etc.) which serve this or adjacent facilities and are disrupted by these construction activities and yet are required by regulation to remain in effect.

End of Section

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SECTION 0160

MATERIALS

A. MATERIALS (Amplification of GC Articles 13 & 50)

1. **General**: Material shall be new and without any indication of damage or overage. If usually packaged, bring to job in original unbroken labeled containers. Materials, devices and equipment not specified but required, shall be of a grade, design and performance equal or superior to related parts of the work. All material shall be suitable for the use intended.

2. **Brand Name Substitutions**: Specific manufacturers and brand names are mentioned herein to establish a standard of design and quality. Except where indicated otherwise, other makes of equal quality and suitability in the opinion of the Architect, may be used subject to approval. Comparison of substitute brands will be with the first named of those listed, and will relate to the overall suitability, quality, compatibility, dependability, life, appearance, size and efficiency of the items compared.

   Prebid approval of substitutions is required only where prebid approval is specifically indicated in subsequent Sections in regard to each particular product. Request for prebid approval must be received at least 10 days prior to bid date and should have attached complete data to support and justify the substitution.

   Where a specific product (or products) is identified, and prebid approval is not required, the product must be furnished by one of the manufacturers so listed unless specific approval (pre or post bid) of another brand is obtained in writing.

   Qualified prebid approval may be given to various vendors at their request on products for which prebid approval is not required; such approvals will be communicated only to the vendor.

   By requesting approval of or by making a substitution, the Contractor shall certify that the product substituted is in all respects equal to, and will function equally well in the project, as the product specified. The Architect at his discretion may require the certification in writing.

3. **Installation**: Install, apply, connect, clean and operate all materials and equipment per manufacturer's directions and recommendations. In the event of conflict between specifications and manufacturer's directions, obtain instructions from Architect. Anchor all items adequately to support intended loading or reasonably anticipated force; employ proper fasteners and anchors suitable for substrate encountered.

4. **Protection of Materials**: Stage, sequence, and protect stored and erected materials from weather and other damage through staging and sequencing of the work, or by temporary covers.

5. **Color Selections**: The color schedule prepared by the Architect will be for color only; it will not justify deviations from Contract requirements (such as changing of finish material, type of paint, etc.) which must be made by Change Order. Where color numbers and names conflict, secure instructions before proceeding. See Section 0130 for samples required.

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6. **Foreign Materials**: See Par 50 of General Conditions provide only materials manufactured, mined or processed in the United States or its territories, provided same are available at reasonable prices.

   Specific to Alabama Public Works Law:
   Section 39-3-4 - (a) Any contractor for a public works project, financed entirely by the State of Alabama or any political subdivision thereof, within this state shall use iron or steel produced within the United States when specifications in the construction contract require the use of iron or steel and do not limit its supply to a sole source under subsection (f) of Section 39-2-2. If the awarding authority decides that the procurement of domestic iron or steel products becomes impractical as a result of a national emergency, national strike, or other cause, the awarding authority shall waive the above restriction.

   (b) In the event the contractor violates the domestic iron or steel requirements of subsection (a), and domestic iron or steel is not used, there shall be a downward adjustment in the contract price equal to any realized savings or benefits to the contractor.

7. **Equipment and Materials Furnished by Owner**: None.

8. **Asbestos Materials**: It is the intent that no asbestos material (friable or nonfriable) be used in this construction. Any inadvertent reference to such use must be called to the attention of the Architect who will issue instructions for use of substitute material. At close of job, Contractor shall certify in writing that no asbestos materials were used in this project.

End of Section

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SECTION 0170

PROJECT CLOSEOUT

A. PROJECT CLOSEOUT (Amplification to GC Articles 10, 11 & 35)

1. **General**: Except as noted, delivery of items listed hereunder are prerequisites of final payment. Establish duration of all guarantees, etc. from Date of Substantial Completion or full occupancy, whichever is earlier (but in no case, earlier than completion and acceptance of a particular item). Submit one (1) written copy of material bound in 3-ring loose-leaf binders indexed and tabbed and one (1) electronic copy on CD in a searchable pdf format divided into chapters and sections.

2. **General Contractor's Warranty**: Furnish as required under General and Supplementary Conditions.

3. **Subcontractors Warranties**: Forward guarantees from subcontractors covering their work where required. The list below is not inclusive:

Pre-engineered Metal Building	Roof
Resilient Flooring	Hard Tile
Electrical	Mechanical

4. **Manufacturer's Warranties**: Furnish diagrams, maintenance manuals, manufacturer's warranties, parts lists and other information pertaining to all equipment installed, together with name of nearest distributor and maintenance representative.

5. **Clean-up**: Clean all metal, plumbing fixtures, exposed finished surfaces, etc. and clean and polish all glass inside and out, leaving building ready for occupancy. Remove all rubbish, surplus material and temporary facilities from site. Coordinate cleaning and waxing of soft tile, cleaning of carpets, changing of air conditioner filters, etc. as required under other Sections.

6. **Attic Stock**: Generate a list of attic stock material, including catalog description, name of vender, quantity and check-off.

7. **Miscellaneous Items**: Furnish the following items which, among others, are indicated elsewhere in specifications and Contract Documents:

   - Contractor's Affidavit of Payment of Debts and Claims
   - Proof of Advertisement of Completion
   - Termite Bond
   - Bonded guarantee of concrete hardening treatment
   - Roof Bond/Service Guarantee
   - Evidence of Job visit by hardware supplier
   - Certified list of paint products employed
   - Certificate of mechanical equipment test
   - Certificate of electrical equipment demonstration
   - Fire Alarm System tested and certified before the final inspection
   - Certification that no asbestos materials were employed

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- Report of static pressure of water supply at building entry
- Certification of hot dip galvanizing of metal fabrications
- Notice from Test Lab that all re-test bills have been paid by Contractor
- Insurance Certificate indicating 2-year coverage for completed operations liability per GC 37-D2
- Final accounting of cash allowances
- Accounting of all attic stock requirements; see Section 0160
- Consent of Surety to final payment (GC 9.10.2)
- A non-resident contractor shall satisfy the awarding authority that he or she has paid all taxes due and payable to the State of Alabama or any political subdivision thereof prior to receiving final payment
- All warranty information and registration forms for equipment shall be filled out with all serial numbers etc.
- Substantial Completion form (fully executed)

8. **Final Inspection**: To be conducted by the Architect and appropriate Public Officials upon notification by Contractor and concurrence by Architect that project is complete. Punch lists prepared at pre-final inspections shall have been worked out.

9. **Year-end Inspection**: To be conducted jointly by Architect and Contractor and appropriate Public Officials approximately l year after completion and upon notice by Contractor. Remedy all defects noted. Give special attention to adjustment of hardware, balancing of air systems and elimination of machinery vibration.

10. **Certificate of Occupancy**: Secure from the Building Official having jurisdiction a Certificate of Occupancy and submit with other close-out material. In the event that partial occupancy, or occupancy prior to full completion, occurs, secure a temporary certificate.

11. **Record Drawings** (Add to GC Article 3.11 / Article 11): Submit as indicated. In addition, provide one (1) set of Bond copy of As-built Documents and one (1) set scanned into a searchable PDF format that will be furnished at cost by the General Contractor to the Owner for his use. As-built documents include the plans (properly marked to show changes in the field) and Project Manual.

    Close-Out Manuals shall be divided into sections as described (but not limited to):
    - Project Completion Documents and Affidavits.
    - Lien Releases.
    - Warranties & Guarantees (in order of specification division) and filled out in the Owner's name and any and all equipment registered with supplier/manufacturer.
    - O&M instructions (in order of specification division).

End of Section

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PHJA/2502-CUA

These specifications sections were prepared by and under the direct Supervision of the Engineer of Record for this project.

Division 02 - CIVIL

0209	Temporary Erosion & Sedimentation Control
0210	Site Clearing and Removals
0220	Earthwork
0250	Concrete Paving & Curbs, Etc.
0251	Asphalt Paving
0260	Water & Gas Distribution
0271	Sanitary Sewer System
0272	Storm Drainage System
0280	Miscellaneous Site Improvements
0290	Finish Grading & Grassing

Prepared by: Jonathan P. McClendon
Engineer

11/11/25
Date

Engineer's Seal



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SECTION 0209

TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: Under this Section provide, maintain throughout the construction period, and subsequently remove, effective temporary erosion and sediment controls, as shown or required to serve this project.

Temporary erosion controls include, but are not limited to, temporary mulching and grassing; seeding, watering and reseeding on-site surfaces and spoil and borrow area surfaces; and providing interceptor ditches at end of berms and at those locations which will ensure that erosion during construction will be maintained within acceptable limits as established by local, State and Federal authorities.

Temporary sedimentation controls include, but are not limited to, silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be captured prior to entering the existing storm drainage systems, streams or rivers.

The Specifications and drawings are not represented as being comprehensive, but rather are intended to convey the intent to provide complete slope protection and erosion control for the Owner’s property, adjacent property, contiguous public space, and other areas, as might be affected by this construction activity.

Should any of the temporary erosion and sediment control measures employed fail to produce results which comply with the requirements of the territory, immediately take whatever steps are necessary to correct the deficiency. Any fines issued by the Alabama Department of Environmental Management due to inadequate BMP's and/or erosion control shall be the contractor's responsibility to pay. It is the Contractor’s responsibility to obtain an ADEM Construction Stormwater Permit prior to beginning construction, should it be necessary. All application fees are the responsibility of the Contractor.

3. **Related Work Specified Elsewhere**:

Section 0080 Storm Water Permit
Section 0150 Temporary Facilities
Section 0210 Site Clearing and Removals
Section 0220 Earthwork
Section 0272 Storm Drainage System

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4. **Reference Documents (for information only)**: ALDOT Standard Specification for Road and Bridge Construction, 2001 Edition, including all supplementary specifications and special provisions.

All Soil Erosion and Sediment Control Ordinances in force at this location by Federal, State and Local Governments.

Alabama Nonpoint Source Management Program Document, as amended, prepared by ADEM, Water Division - Mining & Nonpoint Source Section, in accordance with Section 319 of the Federal Clean Water Act, as amended.

EPA Stormwater Pollution Prevention for Construction Activities, Office of Wastewater Enforcement and Compliance, U.S. Environmental Protection Agency, Washington, D.C. 20460, as amended.

B. GENERAL PROCEDURES

1. **Submittals**: Submit a plan to establish erosion control measures at the beginning of construction and maintain during the entire period of construction. Areas subject to severe erosion, or which are especially vulnerable to erosion and/or sedimentation, shall receive special attention.

2. **Coordination of Activity**: All land-disturbing activities are to be planned and conducted to minimize the size of the area to be exposed at any one time, and the length of time of exposure. All land-disturbing activities are to be planned and conducted so as to minimize off-site sedimentation damage.

3. **Surface Water Controls**: Control surface water runoff originating upgrade (or via exposed areas) by the use of diversion ditches, and/or interceptor dikes, to reduce erosion and sediment loss during the period of exposure.

When the increase in the peak rates and velocity of storm water runoff resulting from a land-disturbing activity causes accelerated erosion of the receiving stream, provide measures to control both the velocity and rate of release so as to minimize accelerated erosion and increased sedimentation of the stream. This may be accomplished through the use of level spreaders or other energy dissipation devices.

4. **Maintenance of Facilities**: Clean out and dispose of all sediment as soon as the storage capacity of any sediment facility is reduced by one-half.

5. **Monitoring and Reports**: Frequent inspections are required. Repair or replacement shall be made promptly as needed.

Make an inspection of all facilities immediately after each construction activity, after each weather disturbance, but not less often than once per week. Submit a report of each inspection.

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C. GRASSING

1. **Temporary Seed Mixes**: Employ as follows, as applicable by season:

   September through December

Abruzzi Rye	70 lbs. per acre
Kentucky 31 Fescue	30 lbs. per acre

   January through April

Kentucky 31 Fescue	30 lbs. per acre
Reseeding Crimson Clover	30 lbs. per acre

   April through August

Brown Top Millett	30 lbs. per acre
Kentucky 31 Fescue	30 lbs. per acre

2. **Fertilizer**: Use a common 10-10-10 mixture at rate of 1000 lbs. per acre.

3. **Netting**: Employ one of the following (several acceptable alternatives are available in most localities; others may also be acceptable by approval of the Architect):

   Enkamat by American Enka Company, Enka, NC
   Typar 3400 Series by DuPont, Wilmington, DE
   Miramat by Mirafi, Charlotte, NC
   Bituminous treated glass fiber conforming to ALDOT Standard Specifications for Road and Bridge Construction.

4. **Temporary Mulching**: Either threshed rye, oat or wheat straw.

5. **Minimum Construction Procedures**:

Scarify slopes to a depth of not less than 3 inches and remove large clods, rocks, stumps; roots larger than ½" in diameter; and all debris.

Sow seed within 24 hours after the ground is scarified with either mechanical seed drills or rotary hand seeders.

Apply mulch loosely and to a thickness between ¾" and 1½".

Apply netting over mulched areas on all surfaces with slopes greater than 4H to 1V.

Roll and water seeded areas in a manner which will encourage sprouting of seeds and growing of grass. Reseed areas which exhibit unsatisfactory growth. Backfill and seed eroded areas.

6. **Maintenance**: Maintain temporary grassing until permanent grassing and/or other planting is installed.

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D. STRAW BALE BARRIERS

1. **Straw Bales**: Bales shall be either wire bound or string tied with bindings oriented around sides rather than over and under.

2. **Placement**: Excavate to the width of the bale and length of the proposed barrier to a minimum depth of 4 inches. Place bales in a single row, lengthwise on proposed line, with ends of adjacent bales tightly abutting one another. In swales and ditches the barrier shall extend to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale.

3. **Staking**: Securely anchor bales by driving at least two stakes or rebars through each bale. Fill the space between bales by wedging straw in the gaps to prevent water from escaping the bales.

4. **Backfill**: Place excavated soil against the barrier. Backfill shall conform to ground level on the downhill side and shall be built up to 4 inches on the uphill side. Loose straw shall then be scattered over the area immediately uphill from a straw barrier.

E. SILT FENCE

1. **Fabric:** Geotextile fabric meeting requirements of AASHTO M-288 and Section 810 of the Alabama Highway Department Specifications.

2. **Placement**: Excavate a 6 inch by 6 inch trench along the lower perimeter of the site, when using pre-manufactured silt fencing. Install the silt fence in accordance with the manufacturer's recommendations.

3. **Pile Brush**: Place in a row along the perimeter of the land-disturbing activities. Winnow brush along contour as close as possible. Brush may require compaction. Construction equipment may be used to accomplish this.

F. INLET PROTECTION

1. **Straw Bale Barrier**: Generally same as outlined above. Place bales lengthwise in a single row surrounding the drop inlet. Adjacent bales shall be pressed together and loose straw then wedged between them to prevent water from entering between bales. Stake and backfill same as typical bale barriers.

2. **Silt fencing** may be used in lieu of hay bales for inlet protection.

G. DUST CONTROL

1. **Dust** generated from the Contractor's performance of the work either inside or outside the right-of-way shall be controlled by the Contractor by applying either water or calcium chloride.

2. **Water** and calcium chloride shall be provided in the amounts and locations in accordance with general local practice.

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H. CLEAN UP

1. **All silt fencing, straw bales, sandbags, brush, etc.** used for sedimentation control shall be removed and all areas cleaned up when erosion and sediment loss no longer occurs and after all earthwork and landscaping operations are complete.

2. **Final clean up** shall not take place until final acceptance of the work.

End of Section

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SECTION 0210

SITE CLEARING AND REMOVALS

A. CLEARING & REMOVALS

1. **General Requirements**: Division One is applicable in full hereto.

2. **Storm Water Permit**: Specified in Section 0080

3. **Blasting and Burning**: Do not allow.

4. **Stripping**: Clear off all vegetable matter and topsoil from within area of building and ten feet beyond, and from areas to be regraded or surfaced. Save trees as noted. Excavate and remove stumps, boulders, logs, old foundations and debris which occurs in area to be graded, surfaced or built over. Contract will be adjusted if such work was not visible prior to beginning and depth exceeds 18 inches below stripped surface. (Verify with Architect whether to remove item more than 18" deep). Stockpile topsoil obtained in clearing operation for use in finish grading as noted in Section "Earthwork".

Topsoil is defined as the natural (undisturbed) upper 4" of soil existing at site before work is begun, plus such additional depth as contains loamy soil, and any soil containing vegetable matter.

Stockpiled topsoil shall be free from trash, brush, stones and debris. Do not strip topsoil when it is excessively wet or dry, and so far as practical, avoid admixture of sub-soil. Do not remove topsoil under branch spread of trees to remain.

5. **Undesirable Materials**: Remove all existing trash and rubbish from site. Remove from site all unsuitable soil encountered, demolition debris, trees, etc. as indicated hereinafter. Assume responsibility for location of dump and length of haul.

6. **Trees and Shrubs**: Remove from within building and pavement perimeters, and as otherwise noted, and carry from site. Top and fell large trees to be removed so as to avoid damaging other trees. Grub stumps to depth of three feet. Remove interfering branches of trees to remain without injury to trunks and cover scars with tree paint. Otherwise cut or trim only with permission.

Upon notice, the Owner will remove all shrubs in work area, which are to be salvaged.

7. **Uncovered Utilities**: Unless shown otherwise, remove all lines encountered within the building area and five feet beyond. Remove all inactive lines which occur beneath and within 12" of new pavement surfaces. Remove all inactive lines encountered in lawn areas within the grading limits, and which will occur within 12" of finish grade. Seal and cap all lines to be abandoned. Protect any lines encountered within pavements and yard areas and which are to remain active. Report any active lines encountered which will occur closer than 18" to a finished pavement or lawn surface or in any case if not indicated on Site Plan. If relocation is required for any line not indicated, contract price will be adjusted.

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Before proceeding with excavation, trenching, stump removal, etc., arrange with various utility companies to visit site, describe and mark any and all of their systems which might be damaged by construction operations.

8. **Obstructions**: Completely remove any and all existing walls, slabs, footings, etc., encountered within grading limits. Such items beyond building area and to be filled over at least 18 inches may be left in place, provided slabs are broken up to facilitate sub-surface drainage.

9. **Pavements**: Remove concrete and asphalt pavement, pads and curbs as indicated. Such removal work not indicated on site plan, but necessary to facilitate new work, shall be accomplished as work of the related trade. Make cuts as neat as practical; where possible break back to nearest joint.

End of Section

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SECTION 0220

EARTHWORK

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

NOTE: Pursuant to provisions outlined in General Conditions Paragraph 19-D, no claim for additional cost resulting from unanticipated soil or rock conditions will be considered unless Written Authorization for such work was issued in advance by the Architect. Conversations with test lab personnel do not constitute authorization.

2. **Site Conditions**: Verify visible conditions prior to bidding and accept site as found. Assume indicated existing topography is approximate only.

3. **Sub-soil Assumptions**: Except as otherwise shown, assume material to be excavated is earth or other material that can be removed by shovel, pick, pump or small bulldozer. If rock is encountered contract price will be adjusted. Rock is defined as ledge or boulders, which cannot be broken or removed without explosives, drills, rippers or bulldozer larger than a D-6. Notify Architect before proceeding with rock removal.

Rock in footing and utility trenches is defined as material, which cannot be removed by the largest backhoe reasonably available to the project.

4. **Subsurface Data**: Borings have been made by an independent laboratory for use in preparing contract documents. Findings are indicated hereinbefore under Division 0, for the convenience of the Contractor. Neither the Owner nor the Architect assumes responsibility for the completeness or accuracy of the soil investigation. The Contractor shall examine the record before bidding and draw his own conclusions therefrom.

5. **Sheeting, Shoring and Bracing**: Provide as necessary to protect persons, improvements and excavations. See note on sheet A2.0 and A5.0 for shoring of existing HVAC concrete pad.

Unless special precautions are taken as noted or required, do not disturb any earth which lies within one foot of the angle of repose of a footing or foundation of an adjacent structure. Subject to engineering data to the contrary, assume such angle as 30° below horizontal.

6. **Trenching for Mechanical, Electrical and Utility Work**: Refer to subsequent Part "Structural Backfill".

7. **Drainage and Dewatering**: Provide as required to accomplish the work, including but not limited to, cutting drainage ditches, use of sump pits and sump pumps, scarifying and disking exposed soils to obtain optimum moisture content.

8. **Erosion and Dust Control**: Provide as necessary to protect property, avoid disturbing neighbors and other occupants of the site, and to meet environmental regulations. Storm Water Permit is specified in Section 0080.

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9. **Line Locators:** Before proceeding with excavation or trenching, arrange with various utility companies and Owners B & G Dept. to visit site, describe and mark any and all of their systems which might be damaged by construction operations. (Line Locator service can be reached at 800-292-8525).

10. **Special Inspectors**: Pursuant to Chapter 17 of the IBC, an independent testing laboratory will be employed to ascertain if the site has been prepared in accordance with the approved soils report, that lifts in an aggregate of 12" or greater and under the structure comply with the soils report, and that the density of the compacted fill meets the specified standard. Tests and observations will be carried out and reports will be issued, in the manner and frequency as indicated in the code. Costs will be paid as set forth in Section 0140.

Note: The type and frequency of tests and observations thus mandated by code do not limit the laboratory testing as is specified elsewhere in his Section, but such tests are to substitute for (not duplicate) the general testing performed.

The Contractor shall provide the lab with a copy of the soils report and generally coordinate and facilitate the work of the special inspectors, taking care that his operations are conducted in a manner that ensure the maximum practical efficiency of lab operations. The Contractor shall schedule tests such that any approved earth surface can be protected by paving over or otherwise secured before the earth loses its prescribed density. Retests caused by a subsequent loss in density shall be paid by the Contractor.

Test Lab Personnel (i.e. Special Inspectors) will have **No Authority** to order work or accept changes, to investigate deficiencies, or to accommodate conditions that might be encountered.

B. SITE GRADING

1. **Scope**: Include area defined by grading limits on drawings.

2. **Rough Grading**: Establish indicated surfaces and subgrades by cut and fill, parallel to proposed finished gradients and at elevations to allow for thickness of topsoil, paving and other installations (contours and spot grades shown are finish elevations). Form surfaces to drain away from building on all sides. Finish ditches, swales, etc. to drain properly. Shape surfaces as rounded or uniform slopes between points given, or between such points and grades to remain. Dress out properly with pavements, curbs, yard inlets, etc. Surfaces to have degree of finish ordinarily obtainable with a bladegrader operation, accurate to within 0.2 foot of that indicated (within 0.15 foot adjacent to and beneath structures and pavements).

Spread fill material in 8” layers and route spreading equipment so that all areas receive uniform and thorough compaction, except construct fill under structures, pavements, etc. as specified hereinafter.

3. **Backfill**: Utilize soil from footing excavation but free of rubbish and vegetable matter. Place and compact as required to prevent settlement and avoid damage to other work. Do not place against foundation walls until slab is poured to support top of wall, concrete has reached design strength, and/or other design considerations have been met. Any additional backfill soil to meet paragraph D4 below.

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Do not employ soil with high plasticity as backfill against the structure or against retaining walls. Where suitable excess earth is not available from the excavation, provide off-site granular (sand-clay) material in the 2 feet immediately adjacent to vertical surfaces.

4. **Work Around Trees**: When trenching around trees, do not cut roots, but instead tunnel under with careful hand digging. Where grade is to be raised, place large washed gravel around trunk so that new earth does not get any closer than 18 inches.

5. **Surplus or Additional Earth**: Bring to site any additional soil required to complete work indicated; fill material shall be fresh clean sand-loam or sand-clay earth from borrow-pit, predominantly granular but suitable for yard fill. Refer to subsequent Parts for imported earth for structural fill.

If additional earth brought to site is from other than the Owner's property, provide certification for an independent environmental test lab that the borrow site has been examined and not found to be contaminated.

Remove any excess earth from the site (except retain topsoil as hereinafter noted).

C. STRUCTURAL EXCAVATION AND BACKFILL

1. **Excavation Generally**: Excavate to depth and extent shown, plus ample space for operations and inspections. Make rough-cuts by machine, with final leveling by hand. Avoid cutting to excessive depth. Do not employ blasting.

Keep all excavations dry. Where practical, open footings to drain free; otherwise dig sump pit adjacent to footing and pump dry in event of rain. Control grading and place removed earth to prevent entrance of surface water.

Remove all unsuitable material from building footprint and **minimum 5 feet** beyond in all directions and remove from site and dispose legally except that portion which can be used for yard fill.

The site may contain unsuitable soil material that must be removed and replaced in addition to the work shown on the drawings and/or described herein. The Contractor shall provide a Unit Price to allow adjustment of the Contract amount should the actual quantity of soil required to be removed and replaced be different than that shown and specified. To that end, the Contractor shall include an Allowance of an additional **50** CY of material in the Base Bid solely as a basis for creating the Unit Price. This Unit price will be for removal and replacement based on in-place quantities installed to the specified compaction. The same Unit Price will be used to adjust the Contract whether the actual amount is a net increase or decrease from the Base Bid quantities (work shown and /or specified plus Allowances).

2. **Subgrade Improvements**: Following removal of cut earth and prior to the placement of fill earth, the exposed subgrade shall be densified to at least 98% standard density in the building area and 5' beyond (limits of undercut). Areas, which fail to compact, shall be undercut to a firm level of soil followed by backfilling with "engineered fill".

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3. **Excavation for Footings**: To exact elevations and dimensions shown with sides cut to line and bottoms finished level and square. Fill any excess cut with concrete. Where earth is not firm provide wood sides; where pervious line with plastic sheet. Keep excavated material at least 18" from edges of trenches. Cut to full depth only immediately prior to pouring concrete to avoid rain, frost damage, or over-drying of soil. Where grades slope, step and overlap trenches with 8" changes in elevation.

4. **Verification of Bearing Soil**: When final bearing level is reached, verify consistency of soil with a penetrometer at approximately 3-foot intervals.

5. **Structural Fill Generally**: Compact each structural fill at optimum moisture, as defined by laboratory control test, and maintain in that condition until the succeeding layer is placed. Submit laboratory analysis of proposed material (cost paid by Contractor).

6. **Fill under Utility Structures, Adjacent to Lighting Standards, Exterior Steps, Sidewalk and Stoops, etc.**: Same as fill beneath slabs on grade.

7. **Trench Backfill**: Backfill foundation and utility trenches with pit run gravel, carefully working layers with mechanical tamper so as not to damage utility lines or exert undue pressure on any nearby walls. Compaction must meet same requirements as area in which trench occurred. Where trench occurs in yard or planting area, terminate compacted backfill 16" below final grade and fill balance with earth loam.

Where trench occurs under pavement, under an interior slab-on-grade, and where the void to be filled is less than 12" wide, employ "flowable mortar trench backfill" as specified in 0335, Special Concrete.

8. **Backfill against Foundation Walls, Manholes, etc.**: Where structure is placed adjacent to an earth cut, backfill the resultant void using same procedure specified for trench backfill.

9. **Compaction Tests**: All filled areas under slabs on grade and all engineered fill shall be tested by an independent testing laboratory using appropriate ASTM procedures. The average of all test results in any given layer shall not be less than that stipulated, and each and every test result shall be within two percent of that value. Where testing indicates insufficient compaction has been obtained, the indicated area shall be reworked and tests conducted again.

The lab must be called to the site on such frequency that no more than 16" of lift has been placed. The lab will, as necessary, perform a double lift test to check each 8-inch strata.

Costs of tests shall be paid as indicated in Division 1.

D. SUPPLEMENTAL REQUIREMENTS FOR PLATFORM CONSTRUCTION

1. **General**: Complete filling operation before beginning foundation work, extending fill until sub-grade elevation at bottom of slab is reached. Carry structural platform 5 feet beyond building line on all sides and slope off at rate not exceeding 2:1.

Note: This work is subject to monitoring by Owner's geotechnical consultant as well as detailed laboratory testing.

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2. **Drainage During Construction**: Immediately following removal of organic topsoil, grade the construction area to insure the removal of surface water. Provide temporary excavation/site drainage in the form of drainage or by other means as necessary to properly drain excavations for the duration of the pad construction and until the site has been graded to provide slope away from the building pad area.

3. **Plastic Clay Excavation**: Proof roll with 40 ton loaded dump trucks or as directed by geotechnical engineer so that engineer can define the extent of localized pockets of soft earth that are to be undercut and backfilled. This plastic clay subgrade shall be graded with 6" (minimum) slope to drain and piping. Minimum depth is 4 feet below bottom of footings. The pad shall slope slightly from south-east to north-west. Assume 2 CY compacted in place per 1,000 sf additional cut due to localized soft pockets. Any additional shall be based on Unit Price.

Compact the plastic clay subgrade to 98% compaction at optimum moisture per ASTM D-698 utilizing a pneumatic or mechanical tamper or sheepsfoot roller.

4. **Structural Fill**: Beneath the building and 5 feet beyond construct an "engineered fill" from the level of the plastic clay excavation to the finished subgrade. Place fill in lifts not exceeding 8" loose measure and compact each layer to 98% of ASTM D-698 standard density at moisture content within 2% of optimum.

Engineered fill material shall consist of a locally available cohesive sandy clay to clayey sand having less than 25% (by weight) of aggregate particles retained on a #4 mesh sieve, less than 55% (by weight) passing the #200 mesh sieve, liquid limit less than 35% and plasticity index in the range of 9 to l4 per ASTM D-2487.

5. **Bearing Level**: Drawings indicate approximate existing grades, but bottoms of footings must be below grade not less than the depth indicated and resting a minimum of 4.0feet on compacted engineered fill.

E. PAVEMENT SUBGRADE

1. **General**: By cut and fill, obtain indicated pavement grades and cross sections making proper allowance for thickness of base and wearing courses. Extend fill construction at least 5-feet beyond pavement.

2. **Construction**: Construct fills of select fill (see paragraph D4), free from topsoil, weeds, or other objectionable matter, in layers not over six inches thick. Prior to fill operations, compact the top six inches of the existing ground surface to 95% of maximum density per ASTM D-698. Compact each layer of fill with a 3-ton sheepsfoot roller (or equivalent) to 100% of maximum density for the top twelve inches, and 98% of maximum density for all fill below this level. Final surface shall be accurate within 1 inch as tested with suitable templates.

Compact areas inaccessible to roller with mechanical tamper. Remove and replace all spongy and unsuitable material. If ruts are formed after rain, reshape and reroll.

3. **Quality Assurance**: Provide employees to check surface in Architect's presence with template and transit. Secure one laboratory compaction test per 3000 sf of surface per 18-inch lift of fill material at points designated by Architect. Laboratory costs to be paid as indicated in Division One.

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Proof roll final surface of cut and fill areas with a heavily loaded truck (minimum 18,000 lb. single axle load), and replace any material which deforms under the load.

F. FINISH AND MISCELLANEOUS EARTH WORK

1. **Final Surfacing**: Spread all topsoil (new and existing) over all regraded areas. Rake out stones, debris, clods, etc. which would hamper finish grading. Bring surface to contours shown and rake smooth, leaving surface ready for seeding. Do not cover topsoil with any earth other than topsoil.

2. **Protection**: Protect newly graded areas from damage. Repair any washing, rutting or settlement that occurs until the project is accepted.

3. **Porous Fill under Slabs**: Five inch thick layer of washed pea gravel (#57 and #67 gradation). Level and compact out to receive vapor barrier membrane.

4. **Erosion Blankets**: Where new slopes exceeding 3:1, at fresh drainage swales and elsewhere indicated, cover earth with American Excelsior Curlex Blankets, lapped to facilitate drainage flow. Secure with wire staples having 6" legs at least .09l" diameter per manufacturer's instructions and so as to secure the installation. (Note: Soil preparation, fertilizing and seeding must be done prior to blanket installation; it is anticipated that grassing contractor will remove and replace blanket when that work is done at the proper season).

End of Section

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SECTION 0228

TERMITE CONTROL

A. SOIL (TERMITE) TREATMENT

1. **General Requirements**: Division One is applicable in full hereto.

2. **Applicator**: Licensed and experienced pest control operator with adequate facilities and equipment who is established in the general locale of the work, and who has been a licensed applicator in this state for at least 5 years. Prebid approval is required; the following are accorded prior approval:

   - Arrow Pest Control - Prattville - 334/365-4610
   - Terminex Service - Montgomery - 334/270-9400
   - Orkin Exterminating Co. - Montgomery - 334/272-3140
   - Cook's Pest Control - Montgomery - 334/273-8873

3. **Guarantee**: Upon completion furnish written warranty against termite infestation for period of five years, during which period the Contractor agrees to retreat all areas if evidence of termite infestation is discovered; and to repair any damage caused thereby to the structure and/or the contents, up to $100,000. Subsequent additions or alterations to the structure which create new termite hazards, or which interfere with the chemical barrier, may void the guarantee.

4. **Renewable Contract**: At end of five year period, offer the Owner a renewable contract (guarantee) on a year-to-year basis at the Owner's option at an agreed upon annual fee.

5. **Material**: Proprietary products as registered with EPA for termite protection use.

6. **Testing**: At his option the Owner may elect to have application tests or soil tests performed on the project; see Division One. The testing laboratory may be asked to test the liquid mix as it is discharged from the pumping equipment or it may be asked to test the concentration in soil on which the material has been applied. Negative test conclusions will result in complete new application at pest control operator's expense.

7. **Submittals**: The pest control operator shall submit the following:

   - Treatment Plan
   - Copy of label showing EPA reg. no. and rate of application
   - Specimen of guarantee

   The Treatment Plan shall include the name of the proposed material to be used and its rate of application, capacity of pumping equipment to be employed, total quantity of material to be used (broken down to show quantity under slab, quantity for foundation walls and grade beams (interior) and quantity around foundation perimeter), and an estimate of time to complete the project.

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8. **Application**: All mixing must be on site, in presence of Architect, from sealed containers. Notify Architect 24 hours prior to application. Begin treatment after footings and foundations walls are in place and sub-grade has been prepared for floor slabs; but as short a time as practical prior to placement of porous fill and vapor barrier. Do not apply material when soil is frozen or is excessively wet as after heavy rain. Treated areas are not to be disturbed during subsequent construction. Application shall be as indicated on the product label.

   As a minimum, treat the following areas:

   - Under slabs on grade
   - Along foundation walls and grade beams
   - Exterior foundation perimeter

End of Section

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SECTION 0250

CONCRETE PAVING & CURBS, ETC.

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Concrete Materials**: Air-entrained 4000 psi concrete, produced and handled as specified under Division 3. Reinforcement of quality and installed as indicated in Division 3.

3. **Joint Filler**: Expansion joint filler to be joint filler of ½" thick asphalt saturated fiber strips meeting ASTM DI75I, cut full depth of concrete after allowance is made for sealant depth.

Contractor Option to furnish Rubber Expansion Joint material per ASTM D1752, equal to JD Russell Company's "Reflex" – Distributor, Construction Materials – 334/272-8200.

Where joint sealer is employed, substitute joint filler of ½" thick asphalt saturated fiber strips meeting ASTM DI75I, cut full depth of concrete after allowance is made for sealant depth.

4. **Curing and Protection**: Cure flat work by covering with weighted and lap-sealed plastic film left in place for 5 days. Cure curbs with burlap kept damp for 48 hours.

Contractors option to instead cure work with a clear, resin base liquid membrane type, spray applied compound meeting ASTM C-309 Type 1-D, Class A, with fugitive dye added (equal to Burke Res-X). Application shall be made immediately after final finishing. If forms are stripped during the curing period, immediately spray the exposed faces. Do not apply resin type cure to any surface to receive a grout bed or a coating of any type.

Protect work from traffic and equipment damage, staining, etc. until acceptance of project.

5. **Qualified Subcontractors**: Award of concrete curb and exposed pavement work shall be limited to established, experienced and dedicated utility contractors who constantly produce quality work and who will coordinate layouts and details. Prebid approval is required.

B. CONCRETE SIDEWALKS

1. **Sub-Grade**: Construct true to grade and cross section. Thoroughly wet and compact with mechanical tamper. Cut out spongy or yielding material to a depth of 6 inches and replace with granular material. Test profile with full width template supported on forms.

2. **Forms**: Oil coated wood or metal with height equal to full concrete depth, sufficiently braced to resist springing. Wood to have 2-inch nominal thickness; except at curved edges, metal must be channel shape with a flat top.

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3. **Construction**: Of 4" and 6" thick concrete of width shown, reinforced with 6" x 6" x w1.4/ w1.4 (6" x 6" x w2.9 x w2.9 at 6" slabs or #4 at 12" o.c.e.w.) mesh meeting ASTM A-1064 unless noted otherwise. Pitch surface ¼" per foot to side for surface drainage. Lay out for uniform slope between points indicated, otherwise with top surface 1 1/2" above adjacent lawn grade, or level with top of adjacent curb. After placing concrete, strike off with side forms and tamp well.

4. **Joints and Scoring**: Provide cross scoring uniformly spaced approximately 4 feet apart unless shown otherwise, with full depth contraction joints not over 12 feet apart (tool joints with Kraft Tool Company's Model CF 317, Bronze 1"). Work out pattern to align with joints in adjacent work or other architectural elements. Install (in cross scoring pattern) expansion joints not over 30 feet apart and where walk contacts building, curb, crosswalk, steps, or other restricting mass.

Where existing walks are to be extended, or where walks are damaged, break back to nearest tooled joint and reconstruct, matching width, finish and scoring.

5. **Finishing**: Float finish true to grade and cross section so that finish surface does not vary more than ¼ inch from a 10 foot template. Produce a non-slip finish using a fine hair push broom in a direction transverse to the line of traffic. Round all edges and joints (including expansion joints) with an edging tool.

C. CONCRETE CURBS

1. **Integral Curb and Gutter**: Install on wetted and thoroughly compacted sub-grade, using standard metal curb forms (wood may be used at curved sections), full depth of curb. Construct to indicated profile in sections with uniform length of ten feet, varied as required to work out, but with no length less than six feet. Separate sections with 1/8" thick steel templates conforming to and 2" deeper than curb profile, removed as soon after pouring as practical.

2. **Expansion Joints**: Cut to match curb profile and extending to within ¼" of top surface. Install wherever curb ends contact a restricting mass, at all curb returns, at tangent points, and on 50-foot intervals between.

3. **Finishing**: Strike off concrete with template true to required section and weighing at least 15 plf, advancing template only when it carries concrete in front of its entire length. Thoroughly tamp concrete by alternately raising and dropping alternate ends of the template so that every square inch is struck at least once. After tamping, float to a true even surface. Check surface with straightedge and immediately correct any variation exceeding ¼" in ten feet. Round all exposed edges to a ½" radius with an edging tool. Complete work with light brooming of surfaces, with strokes run transverse to line of traffic.

D. MISCELLANEOUS WORK

1. **Pad for Condenser or Transformer**: 6" thick concrete slab installed over compacted bed, reinforced with #4 at 12" o.c.e.w. Edges neatly tooled. Verify exact elevation, size and location with HVAC and/or electrical contractor and Architect.

2. **Traffic Striping**: Specified under Section Painting.

End of Section

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SECTION 0251

ASPHALT PAVING

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: Bituminous paved drives and parking areas, including base course and wearing course. Construction of subgrade, painted markings, concrete curbs, and drainage structures are specified under other Sections.

3. **General**: Surfaces shall be smooth and true, sloped to drain properly, conforming to indicated lines, grades and cross sections. Do not work during wet or near freezing weather. Maintain free drainage of area at all times.

4. **Lab Tests**: Laboratory control at the pit and plant is the responsibility of the Contractor. Job site control will be implemented as outlined below and paid as noted in Division 1.

5. **Subgrade**: Specified under Section “Earthwork”. Do not proceed with base until all specified tests indicate that subgrade is satisfactory. Beginning of work will indicate subcontractor’s acceptance of subgrade and responsibility for work constructed thereover.

6. **Asphalt Plant Certification**: Asphalt shall be produced by a plant inspected and certified by the ALDOT as meeting the requirement set forth in the ALDOT standard specifications. Furnish proof on request.

B. BASE COURSE

1. **Material**: Sand-clay-gravel meeting ALDOT Spec. 230 Improved (except that liquid limit shall be 30 maximum and plasticity index must be 9 maximum). Where sizes and grading of aggregates as specified herein are not available, the use of aggregates meeting ALDOT Specs. for similar work may be authorized, provided all other requirements for such materials are met; request for such variance must be made prior to delivery of the material.

2. **Installation**: After sub-grade is approved, install 8 inch (compacted thickness) sand-clay-gravel base placed in 2 equal layers spread with uniform gradation of fine and course material. Compact to 98% first 6” and 100% upper 12” maximum density per ASTM D-698, blading and rolling alternately to obtain a smooth uniformly compacted base. Finish surface shall not vary more than ½” when tested with a 10 foot template.

3. **Tests**: Provide employees to check the surface with a template and transit under the Architect’s direction. Secure one laboratory compaction and thickness test for every 3000 sf of paved areas. From material so removed, secure laboratory analysis of clay gravel indicating gradation and Atterburg Limits (at rate of one analysis per 6000 sf, or major fraction thereof).

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C. BINDER LAYER

1. **Binder Layer**: Single 3.5" (compacted thickness) course hot mixed, hot-laid bituminous concrete conforming to ALDOT Spec. 424, Mix B, on ALDOT Spec. 401 primer coat.

2. **Placing**: Clean surfaces of loose trash, leaves, etc. Spread and strike off with mechanical spreaders. In limited areas where obstacles occur, hand spreading will be permitted. As soon after spreading as material will bear roller, uniformly compact to ALDOT Specifications, producing a smooth, uniform surface in which the aggregates are fully rolled into the layers.

3. **Testing**: Check surface with 10-foot template, and correct variations exceeding ¼". Test thickness of course at rate of one core per 3000 sf; if any core shows a deficiency of ¼", cut six additional cores. If the average of the thicknesses is deficient by ¼", determine the extent of deficiency and correct the area.

Secure a minimum of one laboratory test for mix composition for each day that the mix is being placed.

D. WEARING SURFACE

1. **Surface Course**: Single 2" (compacted thickness) course hot mixed, hot-laid bituminous concrete conforming to ALDOT Spec. 424, Mix A, on ALDOT Spec. 405 tack coat

2. **Placing**: Clean surfaces of loose trash, leaves, etc. Spread and strike off with mechanical spreaders. In limited areas where obstacles occur, hand spreading will be permitted. As soon after spreading as material will bear roller, uniformly compact to ALDOT Specifications, producing a smooth, uniform surface in which the aggregates are fully rolled into the layers.

3. **Testing**: Check surface with 10-foot template, and correct variations exceeding ¼". Test thickness of course at rate of one core per 3000 sf; if any core shows a deficiency of ¼", cut six additional cores. If the average of the thicknesses is deficient by ¼", determine the extent of deficiency and correct the area.

Secure a minimum of one laboratory test for mix composition for each day that the mix is being placed.

D. EXISTING PAVEMENTS

1. **Broken Pavement**: Repair existing pavement where damaged by construction activity. Carefully note and record condition of pavement prior to beginning work. Remove pavement for patching by cutting pavement in straight lines with power saw.

Restore base course with compacted crushed aggregate base course. Backfill in trenches is specified under other Sections; allow initial backfill to settle under traffic for 2 weeks before cutting out for new base course. Install new wearing surface as hereinbefore specified.

2. **Patching of Public Streets**: Restore broken surfaces as prescribed by authorities having jurisdiction.

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3. **Resurfacing**: Include areas as indicated. Where failure has occurred, cut out area to depth of 6" below surface; reform base with 6" of crushed aggregate complying with ALDOT Spec. 825-B. Sweep remaining surfaces clean and apply heavy tack coat. Apply 1½" asphalt meeting ALDOT Spec. 424, Mix A, with mix modified same as for new pavement.

Where existing bituminous surface is over 3" below final finished surface, install a bituminous base course meeting ALDOT Spec. 424, Mix B. Apply emulsified asphalt tack coat over new and existing prepared base course.

Provide tests, protection, etc. as hereinbefore specified. Lay out work, adjusting courses, etc., to provide adequate well-drained surfaces.

Raise existing manhole covers, valve box lids, etc. which occur in resurfaced pavements as necessary to dress out properly.

All patches shall be placed in straight lines, level with existing pavement, without bumps or sinks.

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SECTION 0260

WATER & GAS DISTRIBUTION

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: This Section includes the water and gas distribution systems generally up to a point approximately 5 feet from building walls and including connections to stubouts at those points.

Work shall include all excavation required for installation of work, including the cutting of any pavements encountered. If rock is encountered, contract price will be adjusted only if and as set forth in Section 0220. Safeguard any existing utility work encountered; if any rerouting or change in elevation is required because of said encounter, contract price will be adjusted.

3. **Qualifications**: Subcontractor shall be an established licensed utility contractor with satisfactory experience in at least 3 equivalent projects.

4. **Existing Conditions**: Bidders shall visit site and become acquainted with all job conditions. No consideration will be given after bid opening for alleged misunderstanding regarding utility connections, permits, fees, outfalls, etc.

5. **Codes & Regulations**: Comply with Plumbing and Gas codes and other ordinances of the locality. Where conflicts occur between code and contract drawings or specifications, the most stringent requirement shall apply. Work within the ROW of public streets, easements, etc., shall comply with requirements and ordinances of the authority having jurisdiction, except where requirements herein are more stringent.

6. **Permits**: Provide all permits, pay all fees, and arrange for connections and inspections as required by all authorities having jurisdiction.

7. **Coordination**: In the interest of clearness, the work is not always shown to scale or exact location. Check measurements to pipe, roads, stub-outs, structures and equipment with other drawings and lay out work so as to fit in with other parts. Where doubt arises as to the meaning of the plans and specifications, obtain the Architect's decision before proceeding with parts as may be affected. Coordinate work with other trades.

Before proceeding with excavation or trenching, arrange with various utility companies and Owners B & G Dept. to visit site, describe and mark any and all of their systems which might be damaged by construction operations.

8. **Repair of Existing Pavement**: Where pavement in public ROW is cut or damaged, repair to the satisfaction of authorities having jurisdiction. Repair existing pavement on Owner's property to same quality as original construction, in neatest manner possible. Make all lines straight and true, and all planes flush and smooth.

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9. **Painting**: Paint steel (not cast-iron) members with 2 coats of porch and floor enamel after first touching up prime coat. Paint exposed gas lines with two coats of aluminum paint after assembly. Paint fire hydrants in standard color scheme of the locality.

10. **Phasing**: Interrupt existing services only at times approved by the Owner. Hold such interruptions to the minimum required. See Division One.

11. **Clearing and Adjusting**: Upon completion of work, clear all drains, pipe lines, manholes, etc. Adjust all valves, pack stuffing boxes, remove rubbish and leave work in clean and operating condition.

12. **Record Drawings**: Secure from Architect prints of piping systems and indicate thereon actual location by dimension of all underground piping, and all changes or additions made. // Provide in such detail and manner as is set forth in Division One.

B. EXCAVATION AND BACKFILL

1. **Excavating Generally**: Ensure that curbs and footings and adjacent loadbearing soils are not disturbed in any way. Where a line must pass under a footing, make crossing with the smallest possible trench to accommodate the pipe. Keep excavation free from water, by pumping if necessary. Dig trenches true to line and with a flat, even bottom. Top of all pipe must be at least 30-inches below finish grade. Remove and relocate existing obstructions as directed.

2. **Sheeting, Shoring, and Bracing**: Provide as necessary to protect persons, improvements and excavation.

3. **Backfilling**: Employ granular type earth free from clods, brick, debris, etc. Immediately after testing and/or inspection, carefully backfill trenches to a depth one-half the pipe diameter. Then firmly puddle and tamp as not to disturb the alignment or joints of the pipe. Thereafter, puddle and tamp every vertical foot. Remove surplus earth as stipulated under Section “Earthwork”.

Where trenches extend under paved areas, backfill entire trench depth to density specified under Section “Earthwork” for pavement subgrade, using suitable or lime stabilized material. Arrange for laboratory test of compaction at rate of 1 test per 50 lf of trench; follow arrangements noted in Division 1.

C. OUTSIDE WATER SERVICE

1. **Utility Connection**: Provide a connection to the existing main. No meter is required.

2. **Pipe**: Lines smaller than 3” to be of copper tubing meeting ASTM B-88, Type “K”, with sweat fittings of cast brass or wrought copper.

3. **Joints** and Fittings: Fittings shall meet AWWA Specifications C-110 or C-111, or ASA Specification A21-10 or A21-11. At mechanical joints provide sufficient quantities of bolts, nuts, glands and gaskets for each socket opening on pipe and fittings. Slip-on joints shall have bell end with approved inside contour into which an approved rubber gasket, shaped to fit the bell contour, can be inserted without caulking; plain end of joining pipe shall be beveled for sliding fit without displacing the gasket.

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4. **Gate Valves**: Iron body bronze mounted double-disc non-rising steam type meeting AWWA Specification C500, with water working pressure of 150 pounds. Furnish with hand-wheels and flanged joints for use in pits and cast iron valve boxes and covers where valves occur underground.

5. **Valve and Meter Pits**: Construct as detailed, with 3000 psi concrete meeting requirements of Division 3. Cover shall be neatly constructed of ¼" or heavier checkered plate angle reinforced as noted, painted all sides before being set in place.

6. **Installation**: Handle piping and accessories in such manner as to insure delivery on the work in sound, undamaged condition. Take particular care not to injure the pipe coating. Cut pipe in a neat and workmanlike manner without damage to the pipe. Unless otherwise authorized, cut with an approved type of mechanical cutter (use wheel cutters when practicable).

7. **Placing and Laying**: While suspended in the sling and before lowering into the trench, inspect pipe for defects and tap with a light hammer to detect cracks. Discard defective, damaged, or unsound pipe. Center the spigot in the bell, push the pipe into position and bring into the required alignment. Except where necessary in making connections with other lines, pipe shall be laid with the bells facing in the direction of laying. Except at closures, not less than two lengths of pipe shall be in position ahead of each joint. Insure that pipe has firm bearing on solid ground so that backfill will not cause damage.

8. **Thrust Blocks**: Install to prevent movement of pipe at all tees, plugs, caps, reducers, valves, fire hydrants, and at all bends of 22½ degrees or more. Construct of 2000 psi concrete placed between the pipe and the trench wall so as to provide adequate bearing to absorb thrust in the line and prevent lateral and vertical movement. Form blocks so that joints will be accessible for repairs.

9. **Tests**: After pipe is installed and the trench partially backfilled with joints exposed for examination, subject the newly laid piping or any valved section of piping to a pressure test of 150 psi. Replace defective work as disclosed and repeat test until section can withstand pressure without loss.

10. **Sterilization**: The completed supply line shall be sterilized as required by the current prevailing plumbing code before acceptance for domestic operation. In the absence of a prevailing code follow AWWA C 651.

D. OUTSIDE GAS SERVICE

1. **Utility Connection**: Arrange with local Gas Company for service, with meter located as indicated. Meter and all piping upstream to be furnished and installed by Gas Company. Pay any and all connection costs charged for said installation.

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SECTION 0271

SANITARY SEWER SYSTEM

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: This Section includes the sanitary sewer system generally up to a point approximately 5 feet from building walls and including connections to stubouts at those points. Make adjustments in work as required when existing sewer layout and condition is uncovered.

Work shall include all excavation required for installation of work, including the cutting of any pavements encountered. If rock is encountered, contract price will be adjusted only if and as set forth in Section 0220. Safeguard any existing utility work encountered; if any rerouting or change in elevation is required because of said encounter, contract price will be adjusted.

3. **Qualifications**: Subcontractor shall be an established licensed utility contractor with satisfactory experience in at least 3 equivalent projects.

4. **Existing Conditions**: Bidders shall visit site and become acquainted with all job conditions. No consideration will be given after bid opening for alleged misunderstanding regarding utility connections, permits, fees, outfalls, etc.

5. **Codes & Regulations**: Comply with Plumbing codes and other ordinances of the locality. Where conflicts occur between code and contract drawings or specifications, the most stringent requirement shall apply. Work within the ROW of public streets, easements, etc. shall comply with requirements and ordinances of the authority having jurisdiction, except where requirements herein are more stringent.

6. **Permits**: Provide all permits, pay all fees, and arrange for connections and inspections as required by all authorities having jurisdiction.

7. **Coordination**: In the interest of clearness, the work is not always shown to scale or exact location. Check measurements to pipe, roads, stub-outs, structures and equipment with other drawings and lay out work so as to fit in with other parts. Verify elevations. Where doubt arises as to the meaning of the plans and specifications, obtain the Architect's decision before proceeding with parts as may be affected. Coordinate work with other trades. Upon approval, adjust gradients to avoid intersections with other utilities.

Cooperate with Plumbing Subcontractor by verifying at outset of job the elevation of final downstream connection so that grading of entire sanitary system may be adjusted if and as required. See Section 0104.

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8. **Line Locators:** Before proceeding with excavation or trenching, arrange with various utility companies and Owners B & G Dept. to visit site, describe and mark any and all of their systems which might be damaged by construction operations. (Line Locator service can be reached at 800-292-8525).

9. **Repair of Existing Pavement**: Where pavement in public ROW is cut or damaged, repair to the satisfaction of authorities having jurisdiction. Repair existing pavement on Owner's property to same quality as original construction, in neatest manner possible. Make all lines straight and true, and all planes flush and smooth.

10. **Phasing**: Interrupt existing services only at times approved by the Owner. Hold such interruptions to the minimum required. See Division One.

11. **Clearing and Adjusting**: Upon completion of work, clear all drains, pipe lines, manholes, etc. Remove all debris, mud, etc. leaving system clean and free flowing.

12. **Record Drawings**: Secure from Architect prints of piping systems and indicate thereon actual location by dimension of all underground piping, and all changes or additions made. Provide in such detail and manner as is set forth in Division One.

B. EXCAVATION AND BACKFILL

1. **Excavating Generally**: Ensure that curbs and footings and adjacent loadbearing soils are not disturbed in any way. Where a line must pass under a footing, make crossing with the smallest possible trench to accommodate the pipe. Keep excavation free from water, by pumping if necessary. Dig trenches true to line and with a flat, even bottom. Top of all pipe must be at least 30-inches below finish grade. Remove and relocate existing obstructions as directed.

2. **Sheeting, Shoring, and Bracing**: Provide as necessary to protect persons, improvements and excavation.

3. **Backfilling**: Immediately after testing and/or inspection, carefully backfill trenches with earth free from clods, brick, etc., to a depth one-half the pipe diameter. Then firmly puddle and tamp as not to disturb the alignment or joints of the pipe. Thereafter, puddle and tamp every vertical foot. Do not place clods, brick, etc., in the trench until the pipe has one foot cover, and not in trenches under pavements in any case. Remove surplus earth as stipulated under Section "Earthwork".

Where trenches extend under paved areas, backfill entire trench depth to density specified under Section "Earthwork" for pavement subgrade. Arrange for laboratory test of compaction at rate of 1 test per 50 lf of trench; follow arrangements noted in Division 1.

Do not work over, or walk on, pipe in trenches until covered by layers of earth well tamped in place to a depth of 12 inches over pipe.

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C. PIPE AND INSTALLATION

1. **Pipe**: PVC sewer pipe and fittings meeting ASTM D-3034, SDR 26 solid wall PVC. Make joints with elastomeric gaskets. Pipe and fittings shall bear D-3034 quality assurance designations.

2. **Trenching**: Shape trench bottoms to provide full even support for the barrel of the pipe. Place pipe on undisturbed earth where possible; otherwise provide concrete pads or mortar laid masonry piers near all joints and no further than 8' on centers. Hand excavate around joints to facilitate coupling and prevent support at this point. Backfill as specified above.

3. **Laying Pipe**: Lay with bell at upper end, joints close and even butting all around, and to true line and grade for entire length of run. Visual inspection between manholes etc. shall show a clear view. When work is halted place a stopper over last pipe to prevent entry of foreign substances. Place sufficient backfill around each length to secure it in place before next length is placed. Do not lay pipe on unstable material or when weather conditions are unsuitable. Do not use pipe to drain trenches; pump trenches dry if necessary.

Make all changes in directions with standard fittings. Inspect pipe and fittings for defects before installation. Mark and discard defective materials. Cut pipe shall have smooth regular ends at right angles to axis of pipe.

Lay pipe runs at uniform grade. Except as noted, slope pipe 8" and smaller not less than $^{1}/_{8}$" per foot, and pipe over 8" not less than $^{1}/_{16}$" per foot.

Connect pipe to existing sewer main with a sewer saddle by Cascade Waterworks per the requirements of The Montgomery Water Works and Sanitary Sewer Board.

4. **Other Utilities:** Do not lay sewer pipe in same trench with another pipe or other utility. Where gravity sanitary and storm sewer cross water lines, minimum vertical clearance shall be twelve inches. No joint shall be within three feet horizontally of waterpipe. Where gravity sanitary sewer passes over water line, sewer shall be ductile iron pipe for 15 feet on each side of intersection.

5. **Infiltration:** No leakage of, or into, the sewer shall be permitted.

6. **Cleanouts**: Construct of cast iron pipe with leaded joints, and 4" Josam YL-600-A cleanout fitting with countersunk plug. Anchor top in 6" concrete pad (24" square with 2#4 e.w.) with chamfered edges, set 2" above finish grade (or flush with asphalt or sidewalk).

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SECTION 0272

STORM DRAINAGE SYSTEMS

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: This Section includes the rainwater drainage system generally up to a point approximately 5 feet from building walls and including connections to stubouts at those points. Also included are the foundation drainage system and other items as specified below.

Work shall include all excavation required for installation of work, including the cutting of any pavements encountered. If rock is encountered, contract price will be adjusted only if and as set forth in Section 0220. Safeguard any existing utility work encountered; if any rerouting or change in elevation is required because of said encounter, contract price will be adjusted.

3. **Line Locators**: Before proceeding with excavation or trenching, arrange with various utility companies and Owners B & G Dept. to visit site, describe and mark any and all of their systems which might be damaged by construction operations. (Line Locator service can be reached at 800-292-8525).

4. **Codes and Standards**: Work within the ROW of public streets, easements, etc. shall conform to the requirements and ordinances of the authorities having jurisdiction, except where requirements herein are more stringent.

5. **Record Drawings**: Provide in such detail as is set forth under Division 1.

6. **Sheeting, Shoring, and Bracing**: Provide as needed to protect persons, improvements, and excavations.

B. RAINWATER DRAINAGE SYSTEM

1. **Trenching**: Shape trench bottoms to provide full even support for the barrel of the pipe. Hand excavate around joints to permit caulking and prevent support at this point. Shore and brace as required to protect the work, adjacent structures, and property and people.

2. **Backfilling**: Do not cover over joints until approval is given.

Carefully hand tamp first 12” depth over and around pipe, and for full depth around inlets etc. in 4” layers. Compact remainder of work in layers not exceeding 8”, such that settlement of lawn area will not occur. All backfill must be clean soil, free of debris.

Where trenches extend under paved areas and slab on grade, backfill entire trench depth to density specified under Section “Earthwork” for pavement subgrade.

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3. **Repair of Pavement**: Where pavement in public areas is cut, repair surface in accordance with authorities having jurisdiction. Where existing pavement on Owner's property is cut, repair to standard of original construction in neatest possible manner.

4. **Storm Pipe**: Provide complete with manufactured fittings. Lines 12" and smaller shall be A2000 PVC meeting ASTM D-3034 (or others with prior to bid approval). All lines larger than 12" shall be Class 3, reinforced, T & G concrete pipe meeting ASTM C-76. All pipe shall have class designation cast or imprinted on side.

Connect laterals to 12" pipe with glued and banded saddles. Place saddle on larger pipe and mark hole, saw hole in a neat manner, apply glue, place saddle over pipe being careful to align hole properly; install stainless steel bands around pipe and saddle. Follow manufacturer's recommendations.

Reference Detail 8/A4.0 in the Construction Drawings for downspout boot installation.

Where noted, provide ductile iron pipe as specified in Section Plumbing.

5. **Laying Pipe**: Lay with bell at upper end, joints close and even butting all around, and to true invert for entire length of run. Visual inspection between manholes, etc. shall show a clear view. When work is halted, place a stopper over last pipe to prevent entry of foreign substances.

Place sufficient backfill around each length to secure in place before next length is placed. Do not use pipe to drain trenches; pump trenches dry if necessary. Lay pipe runs at uniform grade. Except as noted, slope pipe 8" and smaller not less than $^{1}/_{8}$" per foot and pipe over 8" not less than $^{1}/_{16}$" per foot.

Caulk bell ends with gasket material, then pack with cement mortar mixed as dry as practical. Join T & G pipe solidly with mortar as recommended by manufacturer. Gasket or solvent weld PVC and ABS joints per manufacturer's recommendations.

6. **Drainage Structures**: Construct manholes, yard inlets, curb inlets, headwalls, junction boxes, etc., of concrete and brick as detailed. Concrete shall be 3000 psi produced, reinforced and placed per requirements of Concrete Division. Brick shall be common brick laid with portland cement mortar. Set lid frame in grout bed so that top will be flush with finished surface in which it occurs.

Structures which occur in sidewalks, curbs or concrete pavement shall be structurally isolated (with preformed expansion joint material) from the work in which it occurs.

Precast portions of manholes shall conform to ASTM C-478.

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7. **Castings for Drainage Structures**: Of gray iron meeting ASTM A-48 in patterns and sizes as noted on drawings.

Provide patterns as follows as selected from Flockhart catalog, or equal by Neenah or Barry-Craft:

Yard Inlet - 24" x 24" x 1" grating with each opening of 4 to 6 sq. inches completed with 1¼ " x 1¼ " x ¼" welded angle frame with anchor lugs.

Traffic Weight Inlets and Covers - cast grating or cover, with cast frames, model number indicated.

C. MISCELLANEOUS DRAINAGE FACILITIES

1. **Underdrain Piping:** Perforated A2000 PVC pipe meeting D-3033 or D-3034), having one row of $^{3}/_{8}$" perforations 3" oc along each side approximately 45° below horizontal, and complete with manufactured tees, ells and other required fittings with tapered socket joints. Pipe shall be 4" diameter unless noted otherwise. Outfall lines shall be same less perforations, with joints solvent welded.

Bed line on carefully sloped porous fill with sides and top covered with 6" minimum washed #57 stone. Protect pipe and porous fill from soil infiltration as noted below. Slope piping between gradient elevations given, or in the absence thereof so as to carry off any ground water that occurs in the plane of the bottom of the basement floor slab. Slope outfall liner $^{1}/_{16}$" plf if not shown otherwise.

2. **Underdrain Protection**: Protect underdrain piping and the porous fill bed with an envelope of filter fabric equal to American Enka Enkadrain.

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SECTION 0280

MISCELLANEOUS SITE IMPROVEMENTS

A. MISCELLANEOUS ITEMS

1. **General Requirements**: Division One is applicable in full hereto.

2. **Traffic Striping**: Specified in Section 0991.

3. **Curb Bumpers**: Precast concrete members with beveled top edges, reinforced with 2-#4 bars, approximately 9" x 5" x 6'-0" long. Furnish each member drilled to receive two ¾ " x 24" steel dowels driven into asphalt surface and set with top 1" below top of bumper. Submit catalog data.

4. **Traffic Signs**: Specified in Sections 0991 and 1000.

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SECTION 0283

CHAIN LINK FENCING

A. CHAIN LINK FENCING

1. **General Requirements**: Division One is applicable in full hereto.

2. **General Description**: Fencing shall be steel chain-link, continuous headrail type, all parts galvanized, product and system of American, USS, Page, Waco or equal, meeting published standards of CLFMI. All ferrous members including fabric, hardware, posts, etc. shall have not less than 1.8 ounces of zinc-coating psf of actual surface covered.

   All components shall be new and without blemish.

3. **Catalog Data**: Submit for approval indicating fabric, posts, hardware, accessories, and gate design.

4. **Repair of Welded Surfaces**: Where galvanized surfaces are damaged by welding or otherwise, repair in shop or field with product ZRC Compound or equal, as approved by Architect.

5. **Posts**: Of galvanized tubular steel, Schedule 40 or equal. Terminal and end posts 4.00” od x 0.160”. Intermediate posts 3” x 0.110”, uniformly spaced at intervals not exceeding 8 feet. Fit all posts with cast aluminum caps of proper type.

6. **Top and Middle Rail**: Of galvanized tubular steel not less than 2½” x 0.130”.

7. **Bracing**: At terminal posts.

8. **Fabric**: 8 feet high, 2” diamond mesh, 9-gauge zinc-coated wire, woven chain link material with barbed-finish top edge meeting FS RR-F-191. Zinc coating shall be applied by the hot dip process after fabrication per ASTM A-392, Class 2, 1.8 osf of actual surface coated. Stretch tightly and fasten to terminal posts with stretcher bars and fabric bands at 15” oc. Stretcher bars ¼” x ¾”. Attach with tie wire to line posts at 15” intervals and to top rail at 24” intervals. Provide tension wire reinforcing along bottom where occurs on concrete deck.

9. **Privacy Slats**: Provide in all fabric, full height and width, one-piece industrial fence slats (color as selected), placed vertically into fence as a vision screen. Provide manufacturer’s 25-year warranty. Provide one-piece lengths in 8-foot fabric. Slats shall provide minimum of 75% screening.

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10. **Installation**: Set posts in solid core, schedule 80 PVC sleeves with washed sand (DO NOT USE CONCRETE). Sleeves shall be at least 2” ID. larger than o.d. of post. Coordinate with General Contractor on setting sleeves in concrete paving.

    Line post sleeves shall be 36” deep. Terminal post shall be 40” deep. Sleeves shall be set in 4,000 psi concrete minimum 6” larger than sleeve and depth. Hold concrete down from finish concrete surface 6” to allow for concrete paving.

    Top of fence shall be in a straight line, parallel with finish grade. Posts shall be plumb.

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SECTION 0290

FINISH GRADING & GRASSING

A. GENERAL

1. **General Requirements**: Provisions of Division One apply in full hereto.

2. **Scope**: Include all areas within grading limits on drawings, and not indicated to be otherwise developed. Do not begin work until preceding rough grading is acceptable; thereafter assume responsibility of completed job. Include areas disturbed by this project.

3. **Water**: To be furnished as noted in Section 0150.

4. **Clean-up**: Promptly remove any soil or similar material which has been brought onto paved areas; keep area clean at all times. Upon completion of work, remove from site all excess soil, stones, and debris.

B. GRADING AND SOIL PREPARATION

1. **Grading**: Remove all debris, gravel and other unsuitable materials. Turn under all present sod and disc or otherwise loosen soil to depth of at least 6" below finished surface. Check for and correct all inaccurate sub-grading, making allowance for any topsoil yet to be placed. Establish finish gradients indicated on site plan, dressing out with walks, curbs, etc., and facilitating surface drainage. Round off changes in slope at bottom and top of banks, etc., for convenient maintenance. Do not proceed with final preparation until immediately preceding the planting season.

2. **Topsoil**: Provide 2" depth over all areas to be sodded. Topsoil shall be fertile, natural soil of suitable loamy character obtained from a well-drained site. It shall contain a normal amount of decomposed matter, but be free of heavy clay, stones, roots and plants, and have a pH of 6 to 6.5. Furnish a soil test report prior to its application.

Topsoil previously stripped and stored on site will be used by General Building Contractor in his work; the 2" indicated above shall be brought to the site by the Landscape Contractor.

3. **Fertilizing**: At least two but not more than eight days prior to planting, apply complete inorganic fertilizer (8% nitrogen, 8% phosphorous, and 8% potash) at rate of 35 lbs. per 1000 sq. ft. of surface. Material must be of uniform composition, dry and free flowing, delivered to site in original containers with manufacturer's analysis attached. Rake lightly into soil and water in.

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C. PLANTING OF LAWN

1. **Sodding**: Required on all lawn areas where slope exceeds one foot vertical per four foot horizontal, as an 8' strip surrounding yard inlets, along swales, etc. which will conduct concentrated drainage, and as a 12" border along all concrete walks and curbs. Sod material shall contain a thick cover of healthy Bermuda Grass (Cynoden Dactylon), be relatively free of weeds, stones or other undesirable material, obtained from an area of sand loam or clay loam nature. It shall be carefully stripped from a cultivated field, cut into strips or squares averaging 3" in depth, arrive at project in freshly dug condition, and be planted not later than 24 hours after lifting. Handle carefully to keep native soil on roots; if stacked during storage place root to root or grass to grass.

Lay out solid in strips without wide joints. On slopes start at bottom parallel to contour of slope. Where slope exceeds 2 to 1, secure sod with 6" long wooden pegs. Place strip or spot sod so that surface of compacted sod is slightly below surrounding surface soil. After completion of each area, roll with light roller and water thoroughly.

D. MAINTENANCE AND REPAIR

1. **Maintenance**: Maintain planted areas and perform all routine watering, weeding, mowing and trimming until lawns are uniformly established, healthy and growing; and until acceptance of overall project, whichever is later. Replant all areas that do not show a good catch and replace any area showing excessive foreign growth within one growing season.

2. **Repair**: Fill gullies and washed places and maintain finished grades until surface is secured with lawn growth. Replant areas affected. Protect surfaces against trespassing or other damage.

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SECTION 0310

CONCRETE FORMWORK

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

B. FORMWORK

1. **Construction Generally**: Design formwork to produce the indicated finish work. Comply with ACI Code 318. Utilize material which is sound and in good condition. Set to true line, dimension and detail, sufficiently strong and tight to support the wet concrete without deflection, vibration or loss of grout.

   Assemble for ready removal without damage to hardened concrete. Construct so that beam sides may be removed without disturbing bottoms. If forms bulge or deflect excessively, remove concrete and rebuild. Coordinate and adjust layout to accommodate elements to be installed by other trades.

   Formwork shall incorporate positive screeding surfaces from which the concrete depth to be cast can be ascertained in advance. Sole reliance on “wet screeding” techniques will not be permitted.

2. **Tolerances**: Except where a more stringent requirement is given, or where necessary to accommodate alignment of finish or abutting elements, the lines, grades, dimensions, etc. of constructed work shall be accurate within tolerances recommended in the ACI Manual of Concrete Practice (ACI 301, Section 4).

   Refer to Section 0330, Finishing to determine the class of tolerance.

3. **Footing Trenches**: Sides true, bottoms level and square. No backfill allowed. Exposed earth shall be in firm, freshly cut condition at time of pour. Install grade markers to insure proper leveling and depth of pour. Clean excavated soil at least 2 feet from trench edge.

4. **Slabs on Grade**: Set screeds, conduits, etc. in a manner such that membrane is not broken except as expressly approved. Run all conduits below vapor barrier. Refer to other Sections for porous fill and vapor barrier. Maintain slab thickness where depressions occur for finishes, etc.

5. **Forms Where Rough Finish is Permitted**: Construct of ⅝” APA Plyform grade plywood with vertical and horizontal joints only overbearing.

6. **Forms Where Smooth or Rubbed Finish is Required**: Same as for rough finish work except material must be such as to produce surfaces equivalent to that produced by new ¾” sheets of APA HDO Plyform plywood. Butt edges and fill joint with pointing compound. Arrange joints to conform to pattern of the design.

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HDO face is not required for surfaces which are to be rub finished. Pointing compound not required where forming sheets are fitted sufficiently tight to avoid producing cement fins.

7. **Cast-in-Place Items**: Install all required cast-in-place inserts, anchors, sleeves, slots, etc.; box out for all slots, recesses or openings as shown or required. Properly locate and secure in cooperation with other trades. See other Sections for embedded items. No grade beams shall be sleeved unless shown on Structural Drawings and approved by the Structural Engineer.

8. **Cleaning, Wetting and Oiling**: Clean forms thoroughly before placing reinforcing. Treat metal and plywood forms with a nonstaining form oil or lacquer. Wash down wood forms just prior to placing of concrete. Keep reinforcing free of oil.

9. **Removal**: Formwork for walls and/or sides of beams, and other parts not supporting the weight of the concrete may be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations, but in no case sooner than 6 days, nor sooner than is stipulated for curing requirements, also see Section 330-J3. Completely remove wood forms from under steps, etc., through temporary openings if necessary.

   Determine the potential compressive strength of in-place concrete by testing field-cured cylinders representative of the concrete location within the structure. If forms are removed sooner than the stipulated time for curing, then provision shall be made to continue curing of the exposed surfaces. A curing program shall be submitted and approved prior to removing any forms.

End of Section

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SECTION 0320

CONCRETE REINFORCING

A. REINFORCING STEEL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Shop Drawings**: Submit for approval, meeting ACI Codes and recommendations. Include placing plan, bending details, bar lists, accessories, etc.

3. **Fabrication**: Reinforcement shall be of proper lengths and shop bent in accordance with design. Adhere to IBC Section 1907. Do not make hot bends.

4. **Bars**: Of deformed billet steel meeting ASTM A-615, Grade 60. Free of loose rust, scale or other coating that will reduce bond. Provide plain bars where employed as slip dowels. Furnish mill certificates upon request.

5. **Mesh**: Welded wire fabric meeting ASTM A-1064, having 75 KSI tensile strength; 6" x 6" x w1.4 / w1.4 unless indicated otherwise. Supply mesh heavier than w1.4 in flat sheets.

6. **Accessories**: Provide metal spacers, chairs, bolsters, stirrups, etc. as required to assemble, space and support members. Follow ACI recommendations. All chairs and bolsters shall have plastic dipped legs. Chairs on vapor barrier membrane shall have protector plates on legs. Provide #4 bars for stirrup supports where not shown otherwise. Provide chairs for conduit, which is not otherwise tied into proper position.

   Clay brick halves on edge or normal weight concrete cubes (not CMU) for support in footings will be permitted.

   Support wire mesh with flexible plastic chairs equal to Lotel “Mesh-ups”, except that standard chairs shall support mesh W4 and heavier.

7. **Placing**: Follow ACI 318 (except as modified by IBC Section 1908). Accurately position steel and secure with 18 GA annealed tie wire at all intersections. Do not drive nails into outside forms to support reinforcement and allow no such device to touch form. Wood strips may be used to maintain clearances provided they are removed ahead of pour. Tie in and brace dowels, top steel, etc. before pouring is begun. Point tie-wire ends away from forms.

8. **Protective Concrete Covering**: Per IBC Par 1907.7 generally as follows:

   - Footings .....3" clear, sides and bottom
   - Interior Slabs .....¾" clear, top, bottom and sides
   - Grade Beams .....2" clear top and sides, 3" clear bottom
   - Between Bars .....1" clear

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9. **Special Conditions**: Provide corner bars at all corners same as horizontal steel in walls and footings. At openings provide adequate header bars and double-up side reinforcement as shown or required to maintain strength.

10. **Splicing**: Avoid points of maximum stress; stagger splices of adjacent bars where possible. Lap bars with Class A splice (per ACI 318), 24 diameters minimum, unless a greater lap is indicated on structural drawings. Lap mesh 6" (8" for W4) at sides and ends, with joints staggered.

End of Section

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SECTION 0330

CAST-IN-PLACE CONCRETE

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: Include all concrete work, complete as shown on structural and architectural drawings except as indicated otherwise. Forms, reinforcing, drainage structures, walks, curbs, paving, splash blocks, and foundations for mechanical and electrical equipment are under other Sections.

3. **Industry Standards**: Except where more stringent requirements are given, comply with applicable portions of ACI codes and standards.

4. **Release for Pouring**: PLACE NO CONCRETE UNTIL THE ARCHITECT HAS OBSERVED THE COMPLETED FORMS OR EXCAVATION WITH ALL REINFORCING, INSERTS, ETC. IN PLACE, PROPERLY SUPPORTED AND TIED. GIVE 24 HOURS ADVANCE NOTICE.

5. **Severe Weather Operations**: Place no concrete when temperature below 35° F is anticipated within 24 hours, unless specific permission is obtained and adequate preheating equipment and curing facilities are employed.

   Maximum concrete temperature at discharge shall not exceed 90° F. Minimum concrete temperature shall not be less than 55° F. Chilled or heated water may be used to achieve desired temperatures but water heated above 99° F shall be combined with aggregate before cement is added. A non-chloride accelerator may be used when air temperature is 50° F or less, but compliance with ACI 306R must be maintained.

B. MATERIALS

1. **Portland Cement**: American made, meeting ASTM C-150, Type I, all same brand and color range.

2. **Air Entraining Agent**: Admixture meeting ASTM C-260.

3. **Aggregate**: Employ fine and coarse aggregate meeting ASTM C-33 (except that sand percentage passing #30 sieve may vary from 15 to 60). Use coarse aggregate Size 67 (¾" max. size) in typical concrete, Size 7 or 8 in toppings and other special mixes. Size 57 may be used in large footings. Submit laboratory tests from producer.

4. **Water**: Clean and fit to drink.

5. **Storage**: Deposit sand and gravel separately on clean, well drained surfaces in such manner to prevent segregation of sizes. Store cement above ground in weathertight bins.

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6. **Inserts, etc.**: Under other Divisions (includes nosings, anchor slots, water stop, reglets, inserts, clips, etc., generally specified with the material to which the insert relates). See Section Formwork.

7. **Bonding Agents, Sealing Compounds, Abrasive Aggregate, Joint Material, etc.**: Refer to subsequent paragraphs and other Sections.

8. **Water Reducing Admix**: Master Builders Pozzolith #122N (122R in summer), or equal by Dewey & Almy, Protex, Euclid or Sika. Additive shall meet ASTM C-494, Type A, and not contain any lignosulfonic acids or their salts, nor more than .01% chloride ions. Do not use an admixture that contains chloride ions where concrete is to be placed over permanent galvanized formdeck or be in contact with aluminum or galvanized products.

C. PROPORTIONING AND MIXING

1. **Strength**: Minimum 28-day compressive strength 3000 psi, except as otherwise noted. See Drawings, Site Work Division and Section “Special Mixes”.

   Where drawings indicate a different strength for two elements, which are to be poured integrally, provide the higher strength for both.

2. **Proportioning**: Establish proportions per ACI 318. Submit mix designs so determined for approval before work is started. Recent designs of same characteristics and determination will be accepted. Use maximum amount of coarse aggregate that will produce plastic, workable mix. Use not less than quantity of cement, and do not exceed quantity of water (which shall include any water in aggregate) as is tabulated below. See Structural Drawings for water/cement ratio.

28 day strength	Minimum cement pcy	Maximum water per bag of cement
3000 psi	5¼ bags	6¾ gal
4000 psi	6¼ bags	5½ gal

   Where water reducing admix is employed, minimum cement content may be reduced up to ¼ bag. Where #7 or #8 coarse aggregate is specified, increase minimum cement by ½ bag pcy.

3. **Water Addition**: No water shall be added to mix at job site. The addition of water at the job site shall be approved and monitored by the Owner’s testing laboratory and shall be recorded on the truck ticket.

4. **Air Entrainment** (add only as required under Division 2): Utilize admixture per manufacturer’s directions to produce air content of 5 to 7 percent.

5. **Water Reducing Admix**: Required for all work on the structure except footings and except where air entrainment is added (Contractor’s option to employ admix where air entrainment is used). Add in amount recommended by manufacturer (indicate on mix design submitted for approval).

6. **Fly Ash**: Do not use.

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7. **Slump**: 3" (± one inch); 4" (± one inch) where water-reducer is added. If slump exceeds that specified, mix shall be discarded; if within the limit but not workable, adjust gradation of aggregate or proportion of fine to coarse aggregate. In no case exceed water-cement ratio.

8. **Batching and Mixing**: By NRMCA certified plant meeting ASTM C-94 (except nonagitating trucks not permitted). The Architect and test lab personnel shall have access to the plant to observe operation. File a delivery ticket at job for each load, indicating date, dispatch time, yards in load, strength, admixtures and slump.

D. CONTROL TESTING

1. **Laboratory Services**: Selection of lab and payment of cost shall be as indicated under Section “Quality Control”.

   Laboratory personnel will visit job site at random times to take air content samples. While at the site, they will also make slump tests and prepare cylinders for compression tests, but these tests are to supplement, not substitute for, the same tests specified below. All samples for control testing (including contractor personnel) shall be taken by ACI or NRMCA certified technicians.

   Laboratory personnel will attend the pre-pour conference and verify the training and equipment afforded the contractor’s personnel. They may also visit the batching plant to observe the operation and sample aggregates being employed. Failure of plant or materials to meet specification requirements will disqualify the concrete supplier.

2. **Compression Tests**: For each type concrete employed, contractor shall take at least one set of three or more test cylinders per ASTM C-172 and C-31 for each 50 cubic yards or major fraction thereof, but not less than one set for each days concreting in excess of 5 yards nor less than one set for each 3000 sf of surface area of walls and slabs. Make up to 20 total additional cylinders as directed. Have one specimen laboratory tested at 7 days and two at 28 days per ASTM C-39 and have reports submitted direct to the Architect within 3 days of break. Reports must indicate exact portion of structure where concrete was used and cylinders shall be marked accordingly.

   Cure specimens at job site at least 2 days. Thereafter crate and transport to laboratory for breaking together with related concrete trip tickets, weather data on the pour day, and the location within the structure represented by the cylinders.

   Strength level will be considered satisfactory only if the average 28-day break of each set equals or exceeds the requirements.

3. **Slump Tests**: Contractor shall make test meeting ASTM C-143 at place of deposit on the first load of each days delivery, at each time a test cylinder is made, and when a change in or deficiency of consistency is noted. Keep records of test results. Take sample per ASTM C-172, except that a single increment sample taken from the second half-yard of concrete discharged shall be used. If the sample fails to meet requirements, immediately take a second sample; upon failure of the second sample reject the load; thereafter check each load until proper consistency has been reestablished.

4. **Air Content Test**: To be tested by lab personnel at random times. Allow 5 tests for project. Samples shall be taken same as for slump test, and tested per ASTM C-231.

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5. **Responsibility**: Tests indicated herein are prescribed only to safeguard the Owner's interest, and Contractor must make such additional tests as he might deem necessary to insure adherence to the specifications, determine form removal time, or otherwise protect his own interests.

6. **Failure to Meet Specifications**: If tests or observations indicate that concrete in a section is below strength or otherwise deficient, the Architect will order additional curing, load tests, drilled cores or Schmidt hammer tests, or combination of these, depending on the nature of the deficiency noted. If as a result of these steps the Architect determines the structure does not meet the requirements of the specifications, the portion affected shall be taken down and rebuilt. Any expense incurred because of such real or apparent deficiencies shall be paid by the Contractor.

E. INSPECTIONS PURSUANT TO IBC CHAPTER 17

1. **Special Inspectors**: In addition to the quality control procedures indicated above, the independent laboratory will provide the Special Inspectors mandated in Chapter 17 of the IBC for structural concrete. Laboratory personnel will inspect forms and re-steel, observe placement of concrete, note installation of cast-in-place bolts and inserts, verify that proper curing is provided, and issue reports, all to the extent and manner as is set forth in the Code.

   Note: IBC special inspection monitoring is not required for footings of structures or wings of light frame construction less than 3 stories in height, for slab-on-grade, for toppings, for pavements nor for retaining walls not inherent to the building structure.

2. **Quality Control Plan**: Pursuant to Section 1705 of the IBC, a guide for monitoring by Special Inspectors of seismic and wind resistant structural systems is shown on the structural drawings.

F. CONSTRUCTION JOINTS

1. **General**: Form joints as indicated or approved, to permit concrete to be placed between joints in a continuous operation, and so as to least impair strength and appearance of work. Utilize dowels and keys where shown or required to establish structural continuity. Allow at least 48 hours between adjacent pours.

   The finish surface across joints shall occur in the proper plane, such that only the joint itself is perceptible. Maintain the typical specified surface up to the very edge of the joint.

   Coordinate joint locations to occur directly below expansion joint lines in hard tile floors. Coordinate between tile patterns and structural drawings. Consult with Architect and with Flooring Contractor.

2. **Joints in Footings**: No horizontal joints permitted. Reduce vertical joints to minimum practical and locate remote from steps, column lines, corners, joints in reinforcing, etc. Securely fasten bulkheads with steel run through at proper level.

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3. **Construction Joints in Slabs on Grade**: Provide as shown and detailed, with maximum area bordered by construction joint or expansion held to 800 sf or less. Joints shall be formed type, either the wood key-joint (wood formed with form removed) or the dowel type. If the dowel type is used, provide a “plastic-sock” bond-breaker in the initial pour and check that dowels are free before placing succeeding pour.

4. **Isolation Joints in Slabs on Grade** (PEJ): Install adjacent to walls, columns, etc. where slab movement would be restricted. Filler material to be asphalt impregnated (35% by weight) fiber strips meeting ASTM D1751, ¼" thick, cut to extend 1" below bottom of slab. Flexible foam strips meeting ASTM D1752 and equal to Meadows Ceramar will also be acceptable.

5. **Grade Beams, Foundation Walls, Continuous Footings, Bond Beams, etc.**: Pour in lengths not exceeding 60 feet. Locate joints in middle third of spans, away from corners, openings, and intersections, concealed in architectural lines if possible. Complete forms, reinforcing, etc. at least 10 feet beyond the joint line.

6. **Bonding**: Form joints with keys, dowels, etc. as detailed. At joints in horizontal members erect bulkheads so that joint will follow a vertical plane at right angle to direction of main reinforcing. To this bulkhead fasten a 2" horizontal wood strip of depth equal to one-third the beam or slab depth to form a tongue and groove joint.

   Before depositing new concrete against hardened concrete, retighten forms, roughen the concrete surface, and remove foreign matter and laitance. Just prior to placing new mix, moisten old surface with water and slush with neat cement grout.

G. HANDLING AND PLACING

1. **Transporting**: In such manner that excessive delay, loss of grout, or separation of ingredients is not caused. Clean conveying equipment at frequent intervals. Pumping and conveyor type equipment shall be of such design to insure a practically continuous flow at the delivery end. Chutes shall be metal lined with all sections at approximately the same slope to insure a uniform flow. Avoid free falls exceeding 48". Utilize a canvas “elephant trunk” or similar device to control drop. Do not employ transporting devices made of aluminum.

2. **Placing**: Deposit concrete as soon as possible after mixing with maximum interval of 60 minutes. Place as near as possible to final position and avoid walking or shoveling. Pour girders, beams and slabs in one operation. Proceed as continuous operation such that no surface will have attained initial set before additional concrete is placed thereon. Use special care to avoid spilling over forms. Place in layers not to exceed 24" in depth and carry up pour as near level as possible. Deposit concrete in columns and walls through a drop-chute. Where pours occur on sloping surfaces, work shall proceed up-hill.

   Earth surfaces shall be moist before pouring begins; if excessively dry, dampen with water; if soggy delay work.

3. **Vibration**: Use of mechanical vibrators, 8000 vibrations per minute minimum, is required. Apply vibrator head directly to the concrete. Avoid causing separation of ingredients by over-vibration, and avoid displacing forms, reinforcing or embedded items. Supplement by hand spading in corners and along wall surfaces. Maintain a spare vibrator at the job site.

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H. FLOOR AND SLAB FINISHING

1. **Screeding and Floating**: Compact and screed off concrete to proper level. Bullfloat surface, working aggregate down and removing excess water.

2. **Surfaces to Receive Thin-set Hard Tile, Resilient Tile, etc**.: Power and hand trowel to produce a smooth, dense surface, finish free of trowel marks. Surfaces shall be within $^{3}/_{16}$" of true plane as tested with a laser transit grid. A 10-foot straightedge, placed anywhere in any direction shall show no gap exceeding $^{3}/_{16}$" and no variations from true exceeding a 0.20 percent slope rate. Begin troweling as soon as little or no cement clings to the blade. Do not sprinkle dry cement on surface to stiffen the mix. Substrate for hard tile shall be textured with fine bristled broom.

   If surface variations exceed allowed tolerance, grind out high areas as soon as possible after pouring (within 3 days if possible) but not until concrete is sufficiently hard to prevent dislodging aggregate. Correct low surfaces with a dense, fast-setting, cement-base, non-latex, trowelable, feathering, self-bonding, self-curing patching compound equal to Ardex K-15 or Thorocrete; verify that compound is compatible with finish floor adhesives and any special finishes to be applied.

3. **Surfaces to Remain Exposed or be Painted**: Achieve tolerances and steel trowel finish as above. Carefully tool edges along isolation and construction joints. Where surface drainage is indicated, provide surface which will not pond water.

4. **Ramps and Platforms**: Steel trowel as above and finish off with hairbrush to produce a non-slip surface. Supplement with metallic shake as specified in Section 0335. Slope to drain as required. Carefully tool at edges.

5. **Walks and Curbs**: See Section 0250.

I. PATCHING AND FINISHING (other than floors and decks)

1. **Patching**: After inspection, but before concrete is thoroughly dry, patch all tie holes, placement joints, stone pockets, voids, etc. (which are permitted by the Architect to be patched in lieu of replacing). Chip out defective areas to minimum depth of 1" with edges perpendicular and carefully patch with retempered mortar to obtain bond and produce a structurally sound surface. Apply Euclid “Euco Weld” bonding compound to the dampened existing surface. Place the patching mortar after the bonding compound has dried. Do not patch in freezing weather. Do not patch surfaces to receive metallic waterproofing.

2. **Rubbed Finish** (required for all work visible upon completion, interior and exterior, that is not specifically excluded): Remove fins, fill holes, etc. as above. Clean surfaces with weak muriatic acid and hose down. Paint surface with grout incorporating Euclid Flex-Con or Larsen Admix 10 (mixed per manufacturer’s instructions) and rub smooth with carborundum brick to produce overall uniform color and texture; complete each area in single days operation with stop made at natural breaks in the surface.

3. **Smooth Finish** (required for exposed work to be painted or to receive special coating): Obtain by using forms specified hereinbefore. Grind off joint marks and leave surface dense, smooth and free of honeycombing, grain marks, or other imperfections, which would be visible through the finish. Remove form release compounds with detergents or weak muriatic acid.

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4. **Rough Finish** (required for exposed work which is not to be rubbed or receive smooth finish, and where a float-finish coating is to be applied): Immediately after striking forms, remove all cement fins. Patch honeycombs and other minor defects.

J. CURING, PROTECTION AND HARDENING

1. **Protection**: Protect work from rapid drying, wash from heavy rain. Provide means to maintain temperature of 70°F for 3 days or 50° for 5 days. Follow applicable ACI recommendations for hot or cold weather placement.

2. **Membrane Curing** (required for typical slabs on grade): Cure surfaces by covering with large sheets of waterproof paper meeting ASTM C171 (Type 1) or 6 mil plastic sheet. Lap and seal edges with tape. Weight sheets to prevent displacement and immediately patch any tears occurring during curing period. Place membrane as soon as surfaces will bear weight of workmen, and leave in place at least six days.

3. **Moist Curing**: Cure vertical surfaces (grade beams) by loosening forms and allowing water to wet surface from top for full six day curing period. If forms are removed earlier, cover walls with burlap mats, which shall be kept continually wet.

4. **Liquid Membrane Curing** (required for foundations and utility work): Liquid shall meet ASTM C-309, Type 1-D, Class B, with fugitive dye, equal to W.R. Meadows CS-309. Equal products by Guardian, Sonneborn or Dayton Superior will also be accepted. Apply in two coats as soon as concrete will bear weight, using lambs wool applicator or pressure sprayer. Apply second coat at right angle to the first. Keep all traffic off for 6 days and recoat areas where film is lost.

   Liquid membrane curing cannot be used on other surfaces against which additional concrete or other material is to be bonded unless it is proven that the curing compound will not prevent bond, or unless positive measures are taken to remove it completely from areas to receive bonded applications. If liquid membrane curing is used, all manufacturers and trades that may be affected shall agree in writing that the use of the product will not adversely effect their applications.

5. **Hardening** (required for all interior slabs to remain exposed including surfaces below raised floor systems): After surfaces have been cured and dried for at least 4 weeks, apply three coats BASF (Sikagard – 300 HD WB) “Lapidolith” in accordance with manufacturer’s directions. Dayton Superior J15, W.R. Meadows “Pena-Lith”, or National Pulverized Metals “Flor-Seal” will be accepted as equal.

   Application by experience workmen. Furnish 5-year material warranty.

End of Section

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SECTION 0335

SPECIAL CONCRETE WORK

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Operations Generally**: Except as noted, all requirements for concrete materials, mixing, handling, curing, finishing, reinforcing, etc. indicated under other Sections apply hereto.

B. SPECIAL MIXES, OPERATIONS AND FINISHES

1. **Mixing and Proportioning**: For operations using in excess of one yard, follow procedures and use special aggregate as specified in Section “Cast-In-Place Concrete”. For operations requiring less than one yard, proportion as noted below and job mix in batch mechanical mixer. Use as little water as possible and still permit proper working.

   Mix pre-prepared grouts as recommended by manufacturer.

2. **Grouts for Bolts, Bearing Plates, Handrails, etc.**: Generally specified with item to be bedded or grouted in. Where not specified, employ factory prepared non-shrink non-corrosive type suitable for purpose. Use as stiff mix and drive into place to obtain fully packed bearing surface.

3. **Flowable Mortar Trench Backfill**: Ready Mix plant produced, flowable fill material composed of cement, sand, Class C or F fly ash, air entraining additives, and water, mixed to produce a 28-day strength of not less than 100 psi (nor more than 200 psi) per ASTM C-39 (modified to accommodate this material). Test cylinders shall be made in 4" x 8" molds without rodding or vibrating. Material shall be sufficiently flowable that vibration or spading is not required for consolidation. Hardened material shall resist penetration of a ½" reinforcing rod supporting the weight of a 150 pound man but shall be excavatable by hand using a pick and shovel. Utilize where noted in Division 2.

   Where the material is employed as a mud slab (or refill of an over excavation) under foundations, provide 500 psi minimum strength, and delete the excavatable requirement.

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SECTION 0400

MASONRY

A. MASONRY

1. **General Requirements**: Division One is applicable in full hereto.

2. **General**: Workmanship shall be first class, with horizontal courses level, vertical joints in alternate courses aligned. Carry work up level where possible; step back for joining new work (toothing not permitted). Do not work when mean daily temperature is below 40 degrees F, or such condition is anticipated within 24 hours. Carefully stack masonry materials on platforms and cover with waterproof sheeting. Cover top of unfinished walls at end of each day's work, and when rain appears imminent, with waterproof material which overhangs the wall at least 2 feet. Cover bottom of finished walls with a 4-foot-wide strip of plastic to prevent staining.

3. **Built-in Work**: Build in anchors, inserts, door frames, lintels, duct opening sleeves, etc. shown or required.

4. **Concrete Block**: Steam-cured hollow lightweight load-bearing concrete masonry units meeting ASTM C-90, Grade N-I. Faces smooth and dense, uniform in texture and free of any defect detrimental to finish appearance. Furnish jamb, lintel, corner, cap blocks and other special shape required.

   All 8" units shall meet International Building Code requirements for 2-hour fire resistance rating, and all 12" units shall meet 4-hour requirements.

   Cut dry and do not wet or allow to become wet before or during laying of wall. Lay in running bond so that one course equals 8" in height, 16" in length. Where possible layout work to course block horizontally and vertically, taking care that masonry will course up through openings, etc. V-tool exposed joints.

5. **Mortar**: Mix typical mortar as one part Magnolia Masons Mix to 2½ parts sand and meeting ASTM C-144, mixed in mechanical mixer to produce ASTM C-270 Type S mortar. For masonry below grade employ Type M mortar mixed as 1 part masonry cement, 1-part portland cement and 2½ parts sand; do not use in exposed work.

6. **Fill In Masonry Below Grade**: Fill wall cavity and cells of all masonry units below grade with concrete as soon as practical after laying. Pour in levels not exceeding two feet. See Concrete Division for mix.

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B. MASONRY REINFORCING AND BONDING

1. **At Typical CMU Walls**: In all block walls install standard weight Dur-O-Wal truss-type horizontal masonry reinforcing of proper width and fabricated from deformed wire galvanized per ASTM A-641, Class 3 (0.8 osf). Provide with preformed corners and tees. Store material under cover; discard if excessive rust forms. Mortar shall surround rods on both sides, with ⅝" minimum coverage.

2. **Bonding Intersecting CMU Walls**: At corners bond by interlocking alternate courses and employing Dur-O-Wal prefabricated corners. At intersecting load bearing walls employ prefabricated Dur-O-Wal tees. Near top course supplement with 1¼" x $^{3}/_{16}$" steel straps with 2" legs extending in opposite directions from 24" stem; place 2 anchors 16" apart and embed ends in filled cores.

   Form control joints at intersecting walls by raking out vertical joints ½" and pointing with elastic pointing compound (pointing is specified under Division 7).

C. MISCELLANEOUS REQUIREMENTS

1. **Cleaning**: Remove excess mortar with wood paddles and fiber brush.

Clean brick with product of ProSoCo, or equal, in strict accordance with manufacturer's instructions. Clean block with wire brushes.

End of Section

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SECTION 0500

METAL WORK

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: All miscellaneous and structural metal and related items necessary for completion of the work and not specified elsewhere.

3. **Submittal Data**: Submit shop drawings and catalog sheets for review.

4. **Painting**: Clean all ferrous non-galvanized shop items per SSPC-SP-l-63 and SSPC-SP-3-63, and give one shop coat of Southern Coatings l-0900 (reddish brown) or Tnemec 99 Red primer. After erection touch up welds and damaged places with same primer (but green in color). Then apply field coat of same primer (but green in color) to all items, which are to be embedded in masonry or otherwise concealed from view.

5. **Handling**: Store all material above ground and protect from damage.

6. **Miscellaneous Screws, Bolts, Washers, Straps, Studs, etc.**: Provide as indicated or required to complete the work. Bolts and washers exposed to the elements shall be galv. or cadmium plated. Expansion bolts shall be lead sleeve type. Powder driven fasteners shall be equal to Ramset PD, of suitable type, sized to penetrate concrete a distance equal to 6 to 8 times diameter of shank, placed not closer than 3” to edge, and placed not sooner than 21 days after pouring concrete. Where spalling occurs patch surface and replace stud with new fasteners driven nearby.

   Bolts in pressure treated lumber to be stainless steel.

7. **Miscellaneous Fabricated Items**: Material shall be clean and free of mill scale, flake rust, seams and other defects. Structural shapes to meet ASTM A-36. Weld, bolt or rivet members as indicated, to form a complete assembly. Follow AISC and AWS Codes. Fabricate as detailed; where exposed, follow best shop practice for custom work with all welds ground smooth, corners and edges true and sharp.

8. **Galvanizing**: Where noted, hot dip structural steel, plates, bars, etc. per ASTM A-123. Hot dip small steel articles and hardware items per ASTM A-153. Fabricate into largest practical sections before galvanizing. Submit certified statement from galvanizer that work meets ASTM specifications.

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9. **Structural Members**: shapes to meet ASTM A-36 unless indicated otherwise, furnish clean and free of mill scale, flake rust, seams and other defects. Steel pipe shall meet ASTM A-53, Standard IPS unless shown otherwise, Grade B. Weld, bolt or rivet members as indicated, to form a complete assembly. Follow AISC and AWS Codes. Provide holes, studs, clips, lugs, brackets, etc. as shown or required for connection of other material.

   Erect members per AISC Code. Grout plates on concrete with redi-mix non-shrink grout. Drive grout into place so that no voids occur and full bearing is developed.

10. **Painted Pipe Railings**: Standard weight steel pipe (verticals extra strong steel pipe) with flush fittings and welded joints ground smooth. Install plumb and true to line. Set verticals in metal sleeves, caulk in with quick setting anchor cement (equal to BASF “Masterflow 110AN” or Euclid’s K-ment Anchoring Cement), and cover with a set-screw type deck flange. Sleeves shall be 4” deep stainless steel pipe section reinforced with a #3 x 24” hairpin strap and having bottom end plugged, all hot-dip-galvanized after fabrication. Provide flanges at wall and anchor with expansion bolts. Finish exposed ends with rounded end caps.

    - Deck flanges for exterior railings shall be galvanized.

End of Section

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SECTION 0610

ROUGH CARPENTRY

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: Include wood plates, nailers, and blocking for installation of all items except as noted otherwise. Also include rough framing, sheathing, etc. as shown and/or specified hereunder.

3. **Workmanship**: Neat and in accordance with best standard practice. All members plumb, level and square well anchored and secured.

4. **Nailing**: Per NLMA recommendations except as otherwise shown. Nails cement coated unless noted otherwise. All fasteners in contact with pressure treated lumber must be stainless steel.

5. **Fasteners**: All fasteners in contact with pressure treated lumber must be stainless steel.

B. MATERIALS GENERALLY

1. **Grades and Sizes**: As defined by the recognized association of manufacturers producing the material. Sizes nominal unless indicated otherwise.

2. **Lumber**: Of live, sound stock, S4S, thoroughly seasoned and air or kiln dried to a maximum moisture content of 15%. Cull or cut out any defect-causing member to be unsuitable for use intended.

3. **Marking**: “Grade Mark”, “Trademark” and “Mill Identification Mark” of the association having jurisdiction shall appear on each piece of yard dimension lumber (not boards) and plywood.

4. **Handling**: Protect all material in transit and at site. Store above ground under cover.

5. **Pressure Treatment**: Pressure treatment system equal to Osmose’s Micropro/Lifewood and substain wood product treated with copper and azole preservative and must comply with AWPA Standards Use Category (UC), with material then **kiln dried (after treatment)** to a moisture content of 15% or less. The specified ingredients of micronized includes copper and tebuconazoie preservative. Product “Yellawood” by Great Southern Wood is an approved product. Others desiring to bid must include information indicated non-corrosive to galvanizing metal and other metal component. The following portions of the work shall be so treated (retention in pcf is shown in parenthesis):

    - Any other member in contact with floor (0.15) AWPA UC2
    - That called for in plans or elsewhere in specifications (0.15) AWPA UC2
    - Lower stud wall plates (0.15) AWPA UC2

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Each piece shall be labeled in accordance with AC326, including the name of the inspection agent, the product name or the treatment company name, plant location, name of preservative compontents with evaluation report number (ESR-2240).

C. PLATES, NAILERS, BLOCKING, CURBS, ETC.

1. **Material**: Pressure Treated S4S-SYP, sizes as shown, #2 Structural Grade and Standard Grade Light Framing members, or better.

2. **Wood Blocking**: As shown on plans or required to facilitate construction. Secure with framing screws where not shown otherwise. At stud walls provide blocking (2 x 6 min. size) to facilitate attachment of door bumpers, millwork, toilet accessories, equipment, toilet partitions, etc.

D. FRAMING

1. **Material** (Studs): #1 Western Spruce-Pine-Fir produced per American Softwood Lumber Standard PS 20-70, in lengths required (#2 and better for bridging only). Cull studs which vary more than $^{3}/_{32}$" from straight. No finger joint material, exposed bark or loose knots will be allowed.

2. **Material** (other than studs): SYP-MC 15 produced per PS 20-70, in long straight lengths carefully selected for use involved. Minimum SPIB grades as follows:

   - Plates and Blocking - Standard Grade Light Framing
   - Headers and Beams - #2 Dense (Fb 1550)

3. **Screwing and Nailing**: With Cement Coated Common Nails or framing screws, equal to Strong-Tie, generally as follows, unless indicated otherwise:

   - Screwing to steel shall be by Phillips/wafer head self-drilling screws with #3-point, size suitable for thickness of steel driven into
   - Typical two-inch framing members 16d (3½")
   - Typical plywood wainscot to framing, Strong-Drive screws (Simpson Strong-Tie) #SDWS16212
   - Screwing plywood wainscot to metal girts, etc. Minimum of 11-16x2 15/16" PWH#3 with proper thread depth

   Employ non-corrosive screws where member will be exposed to elements (**Stainless steel at treated members**).

4. **Notching of Members**: Permitted only where absolutely necessary; add additional material to supplement strength. Make cuts carefully. Drill through middle third of member in preference to notching.

5. **Wall Plates**: Single at bottom of stud wall, double at top. Joints of lower member of top plate overbearing, joints in upper member not closer than 4 feet to joint in lower member. Top plate members lapped at corners and into intersecting partitions, screwed together 16" o.c. staggered with 2 screws at ends.

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6. **Anchoring**: Anchor interior plates on concrete with minimum of 2½" length "Ramset Ramguard" with washer pins 24" o.c. staggered. Where shown (Section B/A6.1) anchor interior 2x6 plates on concrete with stainless steel ½" bolts 32" o.c. (embedded 8" in concrete), with at least two bolts per piece.

7. **Studs**: 2 x 4's spaced 16" o.c. unless noted otherwise. Continuous length bottom plate to top plate. Triple at corners and set to receive finish, well screwed together and to filler blocks. Double at openings with opening side stud extending uncut to underside of header, inside stud extending to top plate and receiving header. Provide triple studs at openings over 6 feet wide. Provide 2 end nails (3 end nails for 2x6) or 3 toenailed (4 toenailed for 2x6) screws each end of each stud. Crown all framing same direction along entire length of wall.

8. **Belting**: In stud walls provide one row horizontal blocking same size as studs, staggered off centerline. Where stud length exceeds 10 feet, provide 2 rows. Where 2x6 stud length extends to rigid frame (Section B/A6.1) provide belting at 48" o.c. vertically.

9. **Lintels and Beams**: Continuous length where possible. Splice only overbearing with joints staggered over alternate supports. Provide lintels as follows unless shown otherwise: double 2 x 6 up to 4 feet span, double 2 x 8 up to 7 feet, over 7 feet see plans.

10. **Partition Bracing**: Brace top plates of stud partitions off overhead structural members with 2 x 4 struts so as to produce sturdy stable wall runs.

11. **Clearances and Fire Stopping**: Provide 2" clearance between metal flue and rough framing. Firestop all such air spaces with ¼" strips of cement board at all floor and ceiling levels.

E. PLYWOOD WAINSCOT

1. **Plywood Wainscot**: APA grade B/C-EXT plywood with exterior glue, ¾" thick and having span index equal to spans to be encountered; grade or better. Install with face grain vertical across supports, with $^{1}/_{16}$" side space. Screw 8" o.c. along edges, and 12" oc along intermediate supports, using 2½" screws specified above.

Where wainscot is attached to girts, install with vertical face grain across supports, with $^{1}/_{16}$" side space. Screw maximum of 8" o.c. across, and 12" o.c. vertical where vertical columns or girts occur. Provide scab wood/dead wood at wainscot joint that are unsupported (door heads, intermediate openings, etc.).

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SECTION 0620

FINISH CARPENTRY & MILLWORK

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: All finish carpentry work, including cabinet work, trim, other items as specified hereunder, and other finished carpentry necessary to complete the work. Include cutting and patching for other trades. Refer to Painting Section for back priming and sealing. Where carpet is scheduled, re-fit doors, base, etc., as required to facilitate installation. Make cutouts in counters for sinks per templates supplied by Plumbing Contractor. Install all finish hardware, specialties, etc. where installation thereof is not specified with the item.

   Related work specified elsewhere:

   - Paint/stain – Section 0990

   Cabinets, countertops, etc. shall be constructed to comply with the 2010 ADA Standards and the contract documents.

3. **Manufacturer**: Manufacturer must have successfully completed 3 projects of equal scope and character must meet the AWI “Q” quality certification program. At least 10 days prior to bids, submit photographs and list of completed projects for review.

4. **Shop Drawings**: Prepare for all shop fabricated work and submit for approval. Include elevations and details of each unit to adequate scale to facilitate checking and accurate fabrication. Indicate detail of drawer construction, shop, and field joints, etc. Obtain and indicate all job measurements required. Include review of material grades and other specification data not readily available to shop personnel.

5. **Hardware**: Furnished under Hardware Section (except as noted). Apply per manufacturer’s instructions; fit accurately and securely. Refer to additional notes in Section Hardware. Employ power routers and jigs. Do not hammer screws into place. Adjust to operate smoothly and properly. Identify all keys for presentation to Owner. Where necessary, remove and replace hardware and doors to facilitate painting.

6. **Workmanship**: Neat and in accordance with best practice. Neatly fit work together, with finish surfaces scribed and jointed without exposed defects. Provide adequate equipment at site including bench saw, jointer and sander. Bring interior finish materials into building only after openings are closed and plaster is dry.

   All material brought to job site shall be free of saw, jointer and planer marks and shall be sanded until smooth with slightly rounded edges. Should such blemishes be found after material is in place and finished, it shall be taken down and returned to the fabricator for reworking and/or replacement.

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7. **Nailing**: In thorough manner with nails of proper type and size. All finish nailing blind where possible, otherwise with heads set and finished over. Nails in exterior work to be of stainless steel.

8. **Wood Materials**: Grades and sizes are as defined by the recognized association producing the material. Sizes nominal unless indicated otherwise. All interior woodwork shall be kiln dried to an average moisture range of 8-13%, and exterior woodwork so dried to 9-14%.

B. INTERIOR TRIM, ETC.

1. **General**: Install trim neatly; fit accurately. Apply members continuous (without intermediate joints); where such joints are unavoidable employ bevel cut, glue and sand smooth and flush. Cope joints in interior corners, miter exterior corners. Properly groove the backs of flat pieces. Nails shall be set without hammer marks showing.

2. **Typical Interior Trim** (paint grade): AWI Custom Grade white pine, basswood, poplar or birch may be used.

3. **Janitor Shelving**: Interior Grade A-B fir plywood with exposed edges solid edged. Support as detailed. Unless shown otherwise shelves to be ¾" thick, except 1" thick where span exceeds 42".

C. CABINET WORK

1. **Scope**: Include work as indicated, complete with finished ends, closures, supports, scribe moulds, anchors, etc., as shown or required to finish out neatly.

2. **Manufacturer**: Qualified and established cabinet shop, which customarily produces first quality work. Construction of cabinets shall comply with contract documents and approved shop drawings or will be rejected after installation.

3. **Workmanship**: In accordance with details and best shop practice. Set partitions, ends, panels, etc. with face grain vertical. Fill and machine sand all exposed plywood edges.

   Fabricate with minimum practical construction joints; arrange joints so that face appearance of work is not altered. Field apply tops, finish base, and splash strips in maximum lengths with joints offset from joints in cabinet units. Scribe top and splash members so that scribe molds are not required.

   Nail thoroughly, from both directions where members with shoulder type joints or intersections occur. Set nail heads ready for finishing. Supplement with glue blocks where good practice requires. Glue and nail, panels into frame assemblies.

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4. **Typical Wood Materials** (paint grade):

   - Heavy framing members – AWI custom grade fir or poplar
   - Tops – Exterior grade AC plywood
   - Splash – AB plywood
   - Doors and Panels – 13 ply A2 grade plywood, hardwood veneered
   - Backs – Grade AB plywood
   - Bottoms – 13-ply A2 grade plywood
   - Shelves – Grade AA plywood (same as doors where exposed)
   - Ends, partitions, drawer bottoms – Grade AB plywood
   - Face pieces – select fir, white pine, basswood, poplar, birch
   - Ends and verticals – Grade AB plywood (same as doors where exposed).

5. **Materials** (paint grade): All exposed solid wood of best grade solid white birch or beech, (or red or white gum). Plywood to be 13-ply A2, one-piece face. Enclosed cabinet interiors may be pine, poplar or fir plywood as noted for paint grade work. Exposed cabinets and shelves to have good face both sides.

6. **Shelving**: Of ¾" plywood (1" if span exceeds 37" and where microwave occurs) of species specified above unless noted otherwise, with grain of outer plies in the direction of span. Exposed edges of fixed shelves to have solid wood glued-on edging. At typical adjustable shelves provide solid wood edge at front and backsides; at back-supported adjustable shelving not terminating at an upright, provide solid wood edge 4 sides.

7. **Drawers**: Bottoms and backs let into sides and front. Secure sides to front with **dovetail or other** Architect approved type glued and nailed interlocking joint. Sides and back of solid lumber ½" thick with rounded top edge. Bottoms shall be ¼" plywood. Fronts of ¾" solid wood, with edges matching doors; vertical edges of flush type shall be tapered to facilitate close fitting when drawer is closed (**two-piece** laminated fronts are not acceptable). Fit all drawers with metal slides, so adjusted that back of drawer front cannot strike cabinet face pieces.

8. **Doors**: Typical doors of ¾" 13 ply A2 grade hardwood veneered plywood with edges carefully cut to profile indicated, all voids shop filled and sanded out. Lip type edges shall be cut square, not lipped together where pairs of doors meet. Square edge type shall be solid edged and carefully fitted with uniform clearance ($^{1}/_{16}$" to ⅛") all around.

   Cabinet doorframe assembly shall consist of 2 vertical stiles, top and bottom horizontal rails. Assembly joints shall be doweled and glued (no pocket screws). Doorframe shall have square edges, with slight radius and partial overlay design.

9. **Base Cabinet Construction**: Construct as detailed with adequate framing members to receive backs, ends, dust panels, etc., and to support the assembly independent of face pieces. Where not shown otherwise tops and end panels shall be of ¾" plywood. Provide bottom panels in all cases (including drawer units). Set sink units after plumbing rough-in so that escutcheons will cover the back panel cutouts.

10. **Wall Cabinets**: Construct as detailed with adjustable shelves where indicated. Provide ¾" partitions behind each 1 x 2 mull to stiffen the assembly, and a continuous 1 x 4 strip along upper back corner through which unit shall be secured to wall. Provide shelves as indicated above.

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D. HARDWARE

1. **Drawer Slides**: Provide K & V #1300 drawer slides for all drawers, sized for maximum drawer depth (#1100 slides for drawers less than 3" deep) (#1305 heavy duty at drawers 10" and deeper).

2. **Pulls**: shall be EPCO Hardware MC402-96 in finish selected by the Architect. Provide polished chrome (US26) in toilet and kitchen areas.

3. **Hinges**: Provide five knuckle, institutional grade, and 2¾" overlay type with hospital tip. Steel shall be a minimum of .095" thick and have a minimum of nine (9) edge and leaf fastenings and are finished to match pulls. Hinges meet ANSI-BHMA standard A156.9, Grade 1 requirement for both vertical and horizontal set and sag (pair of hinges will hold minimum of 310 pounds); use specifically engineered screws for attachment of hinges. Doors 48" high and over shall have three (3) hinges per door.

   Hinges shall be equal to Hafele 5-K270, finish as selected, no other style will be accepted.

6. **Door Catches**: shall be magnetic door catch with minimum five (5) pound pull, attach with screws, and slotted for adjustment. Catches shall be equal to Stanley 35 // 41. Apply catches, as near behind pulls as practical, and to members which are of sufficient depth to receive catch plate; small blocks applied especially to hold catches will not be permitted.

7. **Brackets and Standards**: Provide K & V 255 AL standards with matching 256R brackets for adjustable shelving; apply in rabbeted groove unless and extend standards for full height of uprights. Equal hardware by Grant or Stanley will be accepted.

E. TOPS, SINKS, AND ACCESSORIES

1. **Decorative Laminate Tops**: The Plastic Laminate tops shall be a nominal 1" thick laminate clad top as shown on drawings and shall be constructed with 1" plywood core laminated faced with GP50 (.050) HPDL, and a BK20 backer under side. Tight joint fasteners shall be provided where needed and no joints over the knee spaces. All exposed edges, including edges of splashes where required, shall have same material as top surface. The sink tops shall be furnished with a marine grade plywood core extending three feet to each side of the centerline of the sink. Back splash shall be minimum ¾" plywood, full height unless noted otherwise (see drawings).

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SECTION 0719

UNDERSLAB VAPOR BARRIER

A. VAPOR BARRIER UNDER CONCRETE SLABS

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: Apply under all interior concrete slabs on grade, under all exterior concrete and elsewhere noted.

3. **Inspections**: Secure approval of sub-surface and membrane before covering.

4. **Typical Applications**: Apply one layer of polyolefin film, vapor barrier, meeting ASTM E-1745 Class A with mils indicated. Install in 12-foot widths parallel to direction of pour. Lap joints not less than 6" and seal with manufacturer's recommended adhesive or pressure-sensitive tape. Cover any punctures with an additional layer. Take care to insure that material follows contour of sub-surface so that no strain will be applied to joints when concrete is deposited. Application must comply with ASTM E 1643-98.

   The following will be accepted:
   - Stego Wrap 15 mil Vapor Retarder by STEGO INDUSTRIES, LLC
   - Moistop Ultra by Fortifiber Industries 15 mil
   - W. R. Meadows Perminator 15 mil.
   - Raven Vaporblock 15 mils
   - Griffolyn 15 mil Green
   - Tex-trude Xtreme 15 mils

5. **Typical Exterior Application**: Apply 4 mil layer of polyethylene plastic vapor barrier, per manufacturer's recommendations. Install in widest practical sheets. Lap minimum of 12" and in the direction in which concrete is spread. Fit carefully around pipes, etc., and cover any punctures with additional layer.

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SECTION 0727

FIRESTOPPING

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope:** Installation of laboratory tested firestopping materials at new and or existing openings and voids in or at periphery of fire-rated construction, including but not limited to voids and penetrations created by the following trades:

   - Mechanical, Electrical, Plumbing
   - Structural/Architectural
   - Drywall

   Note: Pursuant to NFPA 101 (A6-2.3.6.2) ('97 Edition), penetrations of electrical conduit (of steel, 6" diameter or smaller) which are in place when rated concrete floors are poured will be assumed to have the rating of the floor in which they occur. Penetrations of such single electrical conduit through rated CMU or concrete walls, either built-in place or back grouted, will be assumed to have the rating of the wall, provided the grouted opening is only slightly larger than the conduit itself, and the opening is fully back-grouted for the thickness of the barrier. Where a cluster of conduit occurs, an approved plan of spacing and grouting must be followed, or the penetration must be sealed by the firestopping contractor. Penetrations by miscellaneous or structural steel members may be treated same as electrical conduit, provided the member will not move in a manner dissimilar from the wall.

3. **Applicator**: Must be trained and certified by the manufacturer whose product he uses and must have successfully completed three projects of equal complexity with the same product proposed for this project; submit lists of projects upon request.

   He must be an established, experienced subcontractor of good reputation.

   The product manufacturer and the applicator must certify that the on-site job workman has been properly trained and is experienced to install the particular systems being used.

4. **Bidding Requirements**: It shall be the responsibility of each discipline (mechanical, plumbing, electrical, structural/architectural, drywall, etc.) to properly estimate the costs involved in the purchase and installation of firestopping materials and assemblies.

   The Contractor has the option of taking unit cost proposals on all firestopping required for the project from a single certified applicator or he may allow each discipline (HVAC, Plumbing, etc.) to submit a proposal on the firestopping required by his work only. However, all firestopping products shall be from a single manufacturer and all trades shall use products from the same manufacturer.

   Note: Use the enclosed Systems and Application Schedule as the basis for each proposal.

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5. **Quality Assurance**: Submit manufacturer's product data, letter of certification of applicator, and certified test report(s) that the materials meet the requirements specified in ASTM E 814 and are so classified in UL's Building Materials Directory or the directory of another testing agency which has the approval of the Architect.

   Should a requirement for firestopping occur where no approved (by testing agency) material or assembly exits, it shall be the responsibility of the manufacturer to propose same, stating the expected hour-rating for the firestopping, based upon his experience with the same material used in a tested application.

6. **Submittals**: Submit shop drawings, product data, certificates and manufacturer's installation instructions under provisions of Section 0130. Submit manufacturer's product data for all materials and prefabricated devices, providing descriptions sufficient for identification at the jobsite; include manufacturer's instructions for installation. Submit shop drawings showing proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details shall reflect actual job conditions.

7. **Delivery, Handling and Storage**: Deliver products in original unopened containers or packages bearing manufacturer's names, brand designations and product descriptions and store undercover and protected from damage under provisions of Section 0160. Do not use damaged or used materials.

8. **Sequencing/Scheduling**: Coordinate the work of this Section with work performed under other Sections (Reference Divisions 7, 13, 14, 15, 16, among others).

9. **Prework Conference**: Required as indicated in Section 0104. Do not proceed prior to conference. All persons involved in the fireproofing application must attend the conference.

B. MATERIALS

1. **Firestopping Materials**: Materials shall be products of 3M Contractor Products, St. Paul, MN, or equal products by Hilti, Nelson, Tulsa, OK, and Grace or others approved in writing at least 10 days prior to bid date.

   Firestopping material shall be asbestos-free and capable of maintaining an effective barrier against flame, smoke and gases per ASTM E 814 and UL 1479.

2. **Firestopping Penetrations**: Materials shall be suitable for the firestopping of penetrations made by steel, glass, plastic and insulated pipe, among others. On insulated pipe, the fire-rating classification must not require removal of this insulation.

3. **Firestopping Construction-Gaps**: Materials shall be suitable for the firestopping of construction-gaps made in the erection of fire rated wall, floor, floor-ceiling, and/or roof-ceiling assemblies and in smoke partitions.

4. **At Conduit Nipples and Thimbles With Bushings**: Provide removable pillow-type firestop at rated walls.

5. **Fire Dampers**: Sealant around fire dampers must be non-expandable type approved by the manufacturer.

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6. **Ratings**: The rating of the firestops shall be 1 hour as required by the rating of the floor or wall assembly (never less than said rating).

C. INSTALLATION

1. **Preparation**: Clean surfaces to be in contact with firestopping materials of dirt, grease, oil, loose materials, rust or other substances that may affect proper fitting or the required fire resistance.

2. **Annular Space of Penetrations**: Annular space (space surrounding penetration) shall not exceed manufacturer's recommendation. Should excess (more than 2%) occur, it shall be the responsibility of the trade (mechanical, plumbing, electrical, etc.) to repair the opening to meet the annular space requirements. Such repair shall meet fire and smoke rating requirements.

3. **Installing:** Install firestopping materials where required, in accordance with code requirements and in accordance with manufacturer's instructions. Seal all holes or voids to ensure an effective smoke barrier.

4. **Identification**: Each seal of penetration shall be tagged with a metal I.D. tag bearing the UL number of the system used to seal that particular penetration.

5. **Inspection**: Firestopping shall remain accessible for inspection by all authorities until approval is given by said authorities.

6. **Schedule of Application**: All materials and systems shall be installed in accordance with the enclosed Systems and Application Schedule which has been prepared by Underwriters Laboratories, Inc. (a similar schedule prepared by another testing agency may be used if it has prior-to-bid approval).

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Systems and Application Schedule

Penetrating Item	Concrete		Gypsum	Wood Floor/Ceiling
Plastic Pipe	Cast-in Device FS195/RC-1 PPD Tuck in WS CP 25WB IC 15WB 3000WT FIP One Step	Pass through device	FS195/RC-1 PPD CP 25WB IC 15WB 3000WT FIP One Step Pass Through Device	FS195/RC-1 PPD CP 25WB IC 15WB 3000WT FIP One Step Pass Through Device
Metal Pipe/Insulated Pipe	Cast in Device FD-150 1000 NS 1003 SL CP 25WB IC 15WB 3000WT Putty Sleeve Kit	Pass Through Device Moldable Putty	FD-150 1000 NS CP 25WB IC 15WB 3000WT Putty Sleeve Kit Pass Through Device Moldable Putty	FD-150 1000 NS CP 25WB IC 15WB 3000WT Putty Sleeve Kit Pass Through Device Moldable Putty
Insulated Cable	Cast-In Device Putty Sleeve Kit Pass Through Device FIP One Step CP 25WB IC 15WB 3000WT Moldable Putty		Putty Sleeve Kit Pass Through Device FIP One Step CP 25WB IC 15WB 3000WT Moldable Putty	Putty Sleeve Kit Pass Through Device FIP One Step CP 25WB IC 15WB 3000WT Moldable Putty
Cable Tray/Busways	CS195 Fire Barrier Pillow Fire Block/Plank FIP One Step CP 25WB IC 15WB Moldable Putty		CS195 Fire Barrier Pillow Fire Block/Plank FIP One Step CP 25WB IC 15WB Moldable Putty	
Glass Pipe	CS195 CP 25WB IC 15 WB		CS195 CP 25WB IC 15WB	
Blank	CS195 Fire Block/Plank Fire Plug Fire Barrier Pillow FIP One Step		CS195 Fire Block/Plank Fire Plug Fire Barrier Pillow FIP One Step	
Construction Joint: **Head of Wall** **Wall to Wall** **Floor to Floor** **Curtain Wall** **Edge of Slab**	FD 200 Spray Water Tight Spray FD 150 Fire and Water tape 1000 NS 1003 SL		FD 200 Spray Water Tight Spray FD 150 Fire and Water tape 1000 NS 1003 SL	FD 200 Spray Water Tight Spray FD 150 Fire and Water tape 1000 NS 1003 SL
Duct Protection	615+ Duct Wrap Dryer Duct Wrap 5A Plenum Wrap		615+ Duct Wrap Dryer Duct Wrap 5A Plenum Wrap	615+ Duct Wrap Dryer Duct Wrap 5A Plenum Wrap

End of Section

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SECTION 0790

JOINT SEALANTS

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: This Section includes the treatment of all exterior building crevices and joints to prevent entry of moisture, air dust and vermin, and which is not included under another Section. Also included are special interior and exterior sealants as noted hereinafter.

   The following sealant work is specified with the related trade or item:

- Bedding thresholds and sidelight sills
- Sealing joints in exterior pavements
- Metal-to-metal and metal-to-glass components of window systems
- Firestop sealants are specified in Section 0727.

3. **Applicator**: Application shall be by an established waterproofing contractor whose main business is waterproofing and/or sealants.

4. **Submittals**: Submit manufacturers catalog data and color samples on each type of material to be employed. Include letter from manufacturer of primary sealant material indicating approval of applicator.

5. **Application**: By experienced workmen only. Apply to clean and dry surfaces during dry weather, when temperature is 50 degrees F or above. Finish all beads with slight recess; do not allow face to project beyond adjacent surface.

6. **Cleaning**: Upon completion remove all excess material (including any staining) from adjoining surfaces. Employ solvents recommended by sealant manufacturer.

B. TYPICAL EXTERIOR SEALANT

1. **Phasing**: At painted surface apply after priming coat but before finish coat.

2. **Color**: Colors as selected from manufacturer's standard colors (generally to match siding, trim, windows, doors.

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3. **Locations**: Application of typical exterior sealant shall include (but is not necessarily limited to) the following locations:

   - At both interior and exterior joints and recesses formed where frames and subsills of windows, doors, louvers, vents and the like adjoin other materials in exterior walls.
   - Joints or recesses on exterior building (including locations not specifically shown or specified) where sealing is required to prevent infiltration of water, moisture and wind into building construction.
   - Openings where items pass through exterior walls.
   - Metal-to-metal joints where sealing is shown or specified.
   - Bottoms of exterior doorway frames.
   - Where sealant is indicated and a special application is not required hereunder in another Section.

4. **Guarantee**: For silicone sealant material utilized for the project, provide a 20-year warranty covering weathertightness and color. Traffic caulking's and other sealants shall carry the manufacturer's standard warranty.

5. **Sealant Material** (Building Joints): Low modulus neutral cure silicone sealant with a proven track record with its current formulation in manufacturer's standard color (minimum offering of 18 colors) as selected. Pre-Bid approval of the material is required. The following manufacturers and formulations have been reviewed and are approved-to-bid:

   - Dow Corning Corporation Product # 791; (989) 496-8115
   - Pecora Corporation Product #864; (215) 723-6051
   - Tremco, Inc. Products, # Spectrem 1

   Other manufacturers requesting approval must do so 15 days prior-to-bid and must submit a Sample Warranty, material history and weathering data for the current formulation; sample jobsite application and a Field Adhesion Test report (for this project) and a Color Chart.

6. **Hard Tile Expansion Joints**: Use Tremco "Tremsil 200 Silicone Sealant.

7. **Joint Preparations**: Verify that joints are completely dry, that mortar is well cured. Remove loose particles of mortar and extraneous matter. Make joint surfaces absolutely clean using brush, air gun, or Xylol as required. Verify that no curing compounds, protective coatings, form release agents, etc. are present and will be detrimental to joint bonding.

   Prime porous and coated surfaces if and as recommended by manufacturer (or test application), before joint packing is installed. The prime coat shall be uniform and completely cover all such surfaces to be bonded.

   Install joint packing to produce a compound depth equal to ½ the width, but not less than ¼" nor more than ½". Joint packing shall be strips of synthetic sponge or foam of type recommended by sealant manufacturer, of sufficient size and density to fit tightly and maintain its position in the joint without stretching.

   Sealant shall bond only to the two opposing faces. Where space for joint packing does not exist, employ a bond breaker tape of the type recommended by sealant manufacturer. Report such joints that will not produce a ¼" depth.

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Unless specific permission is obtained, tape facing surface adjacent to joints before applying sealing compounds. Remove tape immediately after joints have been sealed and tooled.

8. **Application**: Fill joints solid with gun under pressure taking care to fill space uniformly and completely and prevent air pockets. Tool immediately after application and strike off excess material. Follow manufacturer's printed instructions. Rough and uneven caulking will not be accepted; finished surface shall be smooth and uniform and well bonded to building surfaces.

   Unless noted, otherwise, finish joints with a flush, slightly concave face which does not project beyond adjacent surface.

C. SPECIAL APPLICATIONS

1. **Firestop Sealant**: See Section 0727.

2. **Joints in Interior Concrete Floor Slab**: Hold pre-molded joint filler 1" below floor level and form groove with beveled wood strip. After concrete has set remove strip and fill space solid with sealant. Form groove at construction joints in lower floor slab and fill in same manner. Sealant shall be Pecora "Dynatred" or equal product by Tremco or Sonneborn.

3. **Joints in Exterior Concrete**: See Section 0250.

D. TYPICAL INTERIOR CAULKING

1. **Scope**: Apply along juncture where all trim, base, door frames, etc., contacts masonry or any other slightly irregular surfaces to accomplish desired finishing.

2. **Material**: Tremco 834 acrylic latex, Pecora AC-20 acrylic latex or equal by Sonneborn Sonolac acrylic latex caulking compound as approved.

3. **Application**: Rake out and clean joints and crevices. Where deeper than ¾", partially fill with foam backer compatible with sealant. Then fill solid with compound forced into place with gun under pressure. Neatly tool surface. At painted surfaces apply after priming coat but before finish coat.

   Crevices indicated to receive caulking shall be formed by Masonry and Carpentry Trades and shall be rectangular in shape ¼" to ⅜" wide, ½" deep.

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SECTION 0803

HARDWARE

1. **General Requirements**: Division One is applicable in full hereto.

2. **General**: Provide sufficient and adequate hardware to produce a complete, operational job meeting Code requirements. Supply devices with appropriate settings and arrangements, all coordinated with actual conditions encountered. Supply templates to metal door and frame manufacturers. Submit schedule (vertical type listing) for approval. Visit job upon request to verify installation.

3. **Supplier**: The hardware supplier must be an established firm or branch of good reputation, which has finish building hardware as its principal business, which has been established in that location for at least 3 years prior to the bid date, which has a full time manager who is an AHC, and which maintains a parts stock and service capability.

   Pre-bid approval is required; the following are accorded such approval in advance:

   - Mullins Hardware, Birmingham, 205/836-0011
   - Wagstaff Taylor Hardware, Birmingham, 205/836-5625
   - Mullins Hardware, Montgomery, 334/279-7004
   - Commercial Door Products, Montgomery, 334/277-4451
   - Contract Hardware, Columbus, GA 706/563-0355
   - Jordan-Bradley Hardware, Columbus, GA

4. **Silencers**: Provide GJ-64, three each single frame, four for pairs, for all except exterior and labeled doors.

5. **Finish**: Typical items US-26d (US-26 in toilets), closers tan lacquer. Supply butts plated finish to match locks typically, except where prime finish hollow metal doors occurs.

6. **Lock and Latch Sets**: Schlage heavy duty cylindrical sets (ND Series, Athens Design) where specifically scheduled, with thru-bolted rose, 2¾" backset, or equal by Sargent, (or Grade 1 by Corbin/Russwin or Falcon). Latch face plates to be 1" (or 1⅛") wide with standard bevel and square corners. Strikes to be handed ASA standard (4⅞") with curved lip ($1^{3}/_{16}$" lip length at HM frames, 1⅜" at wood frames). All strikes (including mortise deadbolts) to have box housing. Levers and escutcheons shall be Schlage Jupiter Design, except as scheduled otherwise.

   Where scheduled provide Schlage L-Series mortise locks complete with ASA standard curved lip strikes, box housing, and #07 lever and rose.

7. **Cylinders and Keying**: Supply keying to match existing system. Keying factory prepared as directed to match existing system, with change number stamped on keys. Supply 2 keys with each cylinder and 4 master keys. Cams, rings, collars, length etc. shall be appropriate for lock and stile with which each is to function. Furnish keying as directed by the owner.

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8. **Butts**: Supply 1½ pair 4½" x 4 Stanley for each door leaf, as follows:

   - Typical exterior metal doors: #FBB-179, US-2C x P, NRP
   - Typical interior metal doors: #F-179, US-P
   - Typical interior wood doors: #F-179, ½ WS, finish to match locksets
   - Interior doors with closers: add ball-bearing feature
   - Doors to public toilets: heavy weight
   - Doors over 3'-0" wide: heavy weight

9. **Kick and Push Plates**: Trego ⅛" laminated plastic B4E, color as selected (custom color group). Supply 10" high kick plate on all doors with closers; 8" x 16" push plate on all doors with pull handles and no scheduled push plates.

10. **Stops**: Provide for all doors as required by condition, GJ-60C typical. and FB-13X or 14X where other types are impractical.

    Provide GJ 25 bumper where outswing toilet partition doors will strike wall.

11. **Closers**: LCN 4000 (Smoothie) Series, or equal by Sargent, Rixon or Corbin/Russwin, hydraulically controlled, guaranteed for 10 years, sizes as recommended by manufacturer. Furnish complete with necessary arms, adapter plates, soffit shoes, and other accessories. Standard mounting typical; parallel arm where scheduled; bracket mounting not permitted. Install with thru-bolts and grommet nuts (sex bolts on hollow metal doors).

12. **Typical Thresholds** (for Typical Exterior Doors) (Mark MT): Reese #S-256A - 5" wide extruded aluminum rebated saddle.

13. **Cast Rebated Threshold** (Mark CT): American Safety Tread Co. (Helena, AL) Style 815S, Hager 621S, or Barrycraft Style B15S, 4" wide cast aluminum rebated threshold with abrasive finish, ends factory notched to jamb profile.

14. **Bar-type Thresholds** (Mark BT): NGP #838CP rolled aluminum plate threshold 3" wide x ⅜" thick. Supply with full bevel on room side and ⅛" deep bevel on corridor side. Factory drill for stainless steel countersunk anchor screws. Bed on full sealant bed combed out to produce an effective bearing and water seal.

15. **Coat Hooks**: Provide 1 dozen Millberg #454 hooks (without backplate) for installation on backs of toilet doors and elsewhere directed.

16. **Lock Box**: Provide and install where directed, 3 #3200 heavy-duty medium-capacity surface-mounted "Knox-Box", 4" x 5" x 3½" steel plate door, neoprene weather seal, 3-point locking and heavy stainless steel lock cover. Supply in dark bronze finish. Units are available from the Knox Company, Newport Beach, CA, 1-800-552-5669. Authorization to purchase will be provided to the successful bidder.

17. **Catalog Numbers and Substitutions**: Except as noted, scheduled items are by Schlage, Sargent, Stanley, GJ, Rixon, Von Duprin and LCN. Equal hardware by Baldwin, Hager, McKinney, Cipco, Bommer, Norton or others will be accepted.

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18. **Guide for preparing Schedule**: Provide items for each leaf except as obvious otherwise; schedule butts, bumpers, plates etc. as specified above. Room listings identify doors, not secure sides.

Hardware Schedule:		
Set 1	Doors 2 to Exterior	Storeroom Lockset L9080 Surface Closer Butts Metal threshold – cast or metal – See drawings Electric Strike Power Supply Von Duprin PS902 Key Pad – Provide under Electrical Specification
Set 2	Door 6 to Office 100 Door 6 to Office 101 Door 6 to Office 103 Door 6 to Office 104 Door 6 to Office 106 Door 5 to HVAC 106A Door 6 (Rm. 103) to Bay 109	Lockset ND 50 PD
Set 3	Doors 6 (Hall 105) to Bay 109	Lockset ND 50 PD Surface Closer Bar Threshold
Set 4	Door 5 to Toilet 108	Privacy ND 40 S Surface Closer Marble Threshold
Set 5	Door 5 to Jan 107	Lockset ND 80 PD
Set 6	Door 1 to Storage 111	Lockset ND 50 PD Bar Threshold
Set 7	Roll-up Doors 3 and 4	Specified with Door

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SECTION 0812

HOLLOW METAL WORK

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: Provide frames for all scheduled openings with doors, and for view windows and cased openings as indicated. Include hollow metal doors as scheduled and hollow metal specialties as noted hereinafter.

3. **Manufacturers and Fabricator**: Well established manufacturer and factory trained and franchised, experienced fabricator of good reputation approved in writing prior to bidding. The following are accorded approval in advance:

   Habersham Metal Products Co. as manufacturer/fabricator
   Ceco Door Products via Mullins Building Products, Birmingham
   Ceco Door Products via Mullins Building Products, Montgomery
   Steelcraft Manufacturing Co. via Southern Sash, Montgomery
   Megamet Industries, Inc., Birmingham via Mullins Building Product, Montgomery, Birmingham
   Commercial Door Products, Montgomery

4. **Shipping and Protection**: Ship frames with temporary double spreaders across bottom and with shipping blocks to prevent damage. Ship doors with corrugated paper guards and store upright and under cover. Properly tag all items as to location, size, etc.

5. **Shop Drawings**: Submit for review, indicating door swings, locations, elevations, hardware preparation and general construction.

6. **Samples**: Upon request submit for approval a sample section of corner of frame and door, complete with glass stops, prime coating, hinge reinforcing, frame and door welds, floor clip, door head with channel welds and sealed, door and frame hardware prep, door glass cut-out with stops, etc.

B. FRAMES

1. **Material**: Cold rolled steel meeting ASTM A-366. Exterior frames of 14-ga metal with A60 zinc coating per ASTM A924. Typical interior frames of 16 ga metal; 14 ga on frames for door or cased openings over 48” wide or where heavyweight (HW) is scheduled.

2. **Design and Construction**: Custom made welded units with integral stops and rebates. Profile and widths as detailed with no splices in any given run. Finished work shall be strong and true, free of defect, warp or buckle. Trim return not less than ½”. Stops shall project ⅝” at doors and shall mate the loose stops at glass.

   At dry-wall, plywood wainscot, future plywood around entire Bay 1 & 2 construction, return backbend toward the inside of the frame as protection for the dry-wall or plywood face.

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Where jambs die on a ramp or sill, which slopes more than ⅛" in width of frame, cut bottom of frame parallel with slope.

3. **Corner Joints**: Construct with mitered trim face, with face and backbend continuously welded and ground invisible, no filler material allowed. All contact edges closed tight. Secure intersecting sections with mechanical interlock, and supplement by tack welding; tack welding shall be done at stop faces and combined bead length shall be not less than widths of soffit.

4. **Mull and Transom Sections**: Closed tubular construction without visible seams or joints. Joints butt-welded and reinforced with concealed angles not lighter than frame members.

5. **Wall Anchors**: At wood stud walls provide welded-in-place wood stud type 18-gauge Z-clips, 4 per jamb, with length equal to frame width. The clips shall have tabs arranged to anchor to each jamb stud face, and the outer leg of the Z-clip shall be set to receive the full width of the stud webb (rabbet studs to receive tabs if necessary).

   At steel girt walls provide welded-in-place steel stud type 18-gauge Z-clips (equal to Steelcraft closed type), 4 per jamb, with length to equal frame width. Anchor each clip to girt with 2 self-tapping (#14 minimum) screws.

6. **Floor Anchors**: At each outside leg provide a custom, non-slotted anchor clip, one-piece 2" x 2" x 16 ga with length 1" less than frame width (full width of stop face on frames over 9" wide). Clips shall be welded to the frame throat, and the horizontal leg (not pre-drilled) shall receive two anchor studs into the floor.

   Seat interior mulls onto a nesting 12 ga steel bracket with upturned legs which is securely anchored to the floor slab. Place sidelight sills astride a 14 ga channel previously ram-set to floor, with outer faces of sill screwed to up-turned legs of channel.

7. **Hardware Preparation**: Mortise, reinforce, drill and tap to receive mortise hardware in accordance with approved hardware schedule and templates as furnished by Hardware Contractor. Cutouts shall be made precisely, so that seated item fits flush, square, neatly and properly. Provide reinforcement for surface mounted items with drilling to be done in field. Furnish a plaster guard behind all cutouts. Punch interior doors for 3 rubber silencers (one for each leaf of double doors) and set strikes accordingly. Arc weld all reinforcements onto frames.

   Hinge and pivot reinforcement to be 1¼" x 10" x 7 ga minimum; strike, closer and flush bolt reinforcement to be 12 ga minimum. Provide "high frequency reinforcement" 12 ga Z-clips across top and bottom of standard top-hinge reinforcement where heavy weight butts are scheduled.

   If universal butt-weight prep (standard vs. heavyweight) is employed, all butts must be heavyweight and shim pieces discarded. HM fabricator quotes should reflect this choice so hardware quotes can be adjusted. Full dimension, shop-attached steel hinge shim plates may be employed to adjust for butt thickness, but plate edge must flush out with the frame face so that cutout appears architecturally correct.

8. **Priming**: Phosphate treat (ZN or Fe) all material and apply baked-on coat of gray or tan rust inhibitive primer which will pass a 200-hour salt spray and 500-hour humidity test per ASTM B-117 and D-1735. Touch-up any rust spots, which occur.

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9. **Installation**: Check frames for rust prior to setting (frames must be taken down if rust is evident). All frames shall be set before building is made weathertight, shall be field coated on backside with bituminous paint up to a point at least 4-inches above the floor.

   Set frames in advance of stud work. Brace, level and plumb. Remove steel spreaders and replace with 1" wood spreaders nearly as wide as frame depth. Anchor each floor clip with two 3/16" ram-set studs. Position jamb anchors approximately behind butts.

10. **Loose Stops**: Steel, square-edge, hot rolled channels, ⅝" x ⅝" x 3/32". Secure with oval head countersunk zinc plated screws approximately 10" o.c. and within 2" of ends. Corners neatly butted (rails into stiles). Position to provide a glazing recess ¼" wider than glass is thick.

    Applied stops to be installed on secure side of frames.

11. **Field Splicing**: Permitted only on large multiple frames, with joints in interior corners. Detail subject to approval.

12. **Structural Reinforcing**: Reinforce transom bars in frames 6 feet through 8 feet wide with 12 ga channel stiffeners. Stiffener shall extend 4" past jamb trim to be built into masonry work.

C. DOORS

1. **General**: Provide flush designs as indicated, meeting SDI Standard 100.

2. **Materials**: Commercial quality, leveled, cold rolled steel meeting ASTM A-366, free of scale, pitting or other surface defects. Fabricate exterior doors of galvanized sheet (A60 zinc coating per ASTM A-924, with certification from fabricator on each door).

3. **Preparation for Hardware**: Neatly and accurately mortise, reinforce, drill and tap to receive hardware per approved schedule and templates. Provide reinforcing for holders, closers, pulls, and other surface applied items (except kick plates, etc.). Reinforce cutouts for cylindrical locks with units equal Schlage #1090.

   Hardware preparation shall be custom for each door application. Universal (non-handed) butt prep is unacceptable. If universal weight prep (standard vs. heavyweight butts) is employed, all butts must be heavyweight and shim pieces discarded or ground away. Full dimension shop-attached hinge shim plates may be used to adjust for butt thickness, same as noted for frames.

4. **Finishing**: Dress, fill and sand so as to make all faces and vertical edges smooth and level. Phosphate treat (Fe or ZN) all material and apply baked-on coat of gray or tan rust inhibitive primer which will pass a 200-hour salt spray and 500-hour humidity test per ASTM B-117 and D-1735. Touch up any rust spots, which occur.

5. **Sizes, Clearance and Edges**: Sizes as scheduled, 1¾" thick. Stile edges to have standard bevel. Edge clearance at head and jambs and between meeting edges of pairs of doors to be 1/16" minimum, ⅛" maximum, uniform at any given door. Provide ⅛" bottom clearance at exterior thresholds, ¼" at interior thresholds, ⅜" bottom clearance above finish (the higher of meeting finishes) where no threshold occurs. Adjust clearances further if necessary to facilitate hardware operation or to meet NFPA 80

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6. **Lights**: Prepare openings to receive glazing as scheduled. Frames shall be of 18 ga steel with mitered and welded corners and return trim, prime finished, equal to Anemostat No. BFL-123. Other type preparation will be accepted upon written approval granted after receipt of a sample found to be equal in function and appearance.

7. **Typical Exterior Doors**: Handed, fully seamless, extra heavy-duty construction, without visible joints on faces or vertical edges. Fabricate with 16 ga zinc-coated face sheets reinforced with continuous 22 ga interlocking vertical stiffeners 6" o.c. and welded to both faces, then sound deadened and insulated with mineral wool or fiberglass batts. Provide at top and bottom an inverted 14 ga galvanized filler channel. Bottom channel to permit spring bronze weatherstrip to be recessed into door bottom and to have holes to permit escape of entrapped moisture. Top edge shall be **capped** with a 14 ga channel **welded** to both faces, filled, ground smooth and made watertight **prior to delivery**. Construction shall comply with NMMA 861.

End of Section

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SECTION 0820

WOOD DOORS

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Shop Drawings:** Submit for approval indicating brand names, types,sizes, manufacturing details and cutouts. Include catalog data highlighted as appropriate. Submit plastic laminate samples and prefinished veneer samples for color selection. Upon request submit a 12" x 12" sample cut from top corner of each door type.

3. **Warpage**: Replace any door which, within 2 years of acceptance, assumes a ¼" warp from true plane, or which warps so as to impede the operation of the door or hardware.

4. **Factory Prefit, Prefinish and Preparation**: All doors shall be factory prefinished, prefitted and prepared for all hardware, louvers, lights, etc. It shall be the responsibility of the door supplier to obtain actual dimensions, hardware templates, etc. for the successful installation of all doors. Hardware prep shall include pilot holes for screws.

5. **Quality Verification**: Architect reserves the right to require that any one door of each type be sectioned to verify the makeup of the door. The door shall be replaced by the door supplier.

6. **Defective and Damaged Doors**: Replace any door which is scratched, dented, scraped or is otherwise marred. The Contractor is cautioned to protect all doors until the project has been accepted.

   Replace any door which telegraphs its construction through the veneer to such extent that the appearance is affected.

B. SHOP AND FIELD WORK (Wood Veneer Doors)

1. **Louvers and Lights**: Prepare openings per details complete with stops.

   Typical stops shall be beveled, rebated, non-lip type of hardwood matching door veneer, set loose on one face. Seal stops and opening edges at shop. Properly block-in around openings in hollow core doors.

   Metal louvers, glass and setting thereof is specified elsewhere.

2. **Handling**: Store and hang only in dry areas, which have been closed to weather. Doors shall be stacked flat on carefully leveled supports.

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3. **Hanging and Fitting**: Install plumb and square, to operate without tension. Provide 1/16" clearance at butt jamb, and ⅛" at top and lock jamb. When planing to fit, trim equally from both sides. If height is reduced more than ¾", trim equally from top and bottom but never more than ¾" from bottom. Set bottom clearance ⅛" from a threshold. Set bottom edge to clear carpet and tile ⅜", plus or minus ⅛" (rated doors over carpet cannot clear concrete substrate more than ¾").

   Bevel lock edge ⅛" in 2" and hinge edge 1/16" in 2". Round both stiles of double-acting doors to a 2¼" radius. Carefully fit hardware with special power routers and jigs. Round all vertical and horizontal edges and corners to an approximate 1/16" radius.

   After fitting, reseal all trimmed edges and all surfaces routed for hardware.

C. FLUSH VENEERED WOOD DOORS

1. **Seal and Guarantee**: Doors shall conform to the WDMA Standards and bear the WDMAEWE Hardwood Door "Quality Certified" Seal of Approval. Exterior doors shall also bear the Type I glue bond mark. All doors shall be marked to indicate the manufacturer and series of construction.

2. **Acceptable Manufacturers**: Algoma, Eggers, Oshkosh, Marshfield or others approved in advance of bidding.

3. **Flush Solid Core Doors** (shop area): Marshfield DSC-1 staved-lumber core; 5-ply hot pressure Type I waterproof glued. Sizes as scheduled. Cross-banding 1/10" before sanding. Double rail bands at least 1¼" thick overall. Stile edge bands of ¾" minimum hardwood matching face veneer.

   Face veneers birch, maple, ash, and one species for project. All faces and edges factory sealed.

End of Section

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SECTION 0830

SPECIAL DOORS

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Submittals**: Submit catalog data and/or shop drawings (as applicable) for all items furnished under this Section.

3. **Installation**: In accordance with manufacturer's instructions, complete with all clips, anchors, attachments, etc. required. Adjust to operate smoothly.

B. ACCESS DOORS

1. **Typical Access Doors** (interior walls): Access doors in typical dry wall shall be Milcor, painted galvanized metal with drywall flange and bead, screwdriver cam latch. Model #DW-M-22-22-3203018. Provide behind door #6 in Conference Room #106 for access to water shut-off and pressure reducer.

2. **Equal Products**: Equal doors by Soico, Karp, or others will be accepted.

C. SECTIONAL OVERHEAD DOORS

1. **Sectional Insulated Overhead Doors** (Scheduled Doors #3 and #4): Clopay #3220, 20 gauge, pre-finished steel (color as selected), insulated door. Doors #3 shall be electrically operated with remote control station, obstruction detection, photo cell, limit switches, radio control with external antenna.

   Provide tinted tempered glazing. Wind load per structural drawings noted. Provide bottom, jamb and head seals.

   Provide chain style raising operation with sliding latch.

   Equal units by Cornell, Wayne-Dalton, Cookson, Overhead Door or others will be accepted.

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SECTION 0881

GLASS AND GLAZING

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

B. TYPICAL GLASS

1. **General**: Furnish types as noted on drawings, all meeting ASTM C-1036.

   Flat glass by Pilkington, AFG or PPG. Patterned and wire glass by Pilkington or Blue Ridge. Where required size cannot be supplied, provide similar glass in better quality or greater thickness. Furnish each light with a label indicating quality and do not remove until approval is given. Tinting shall match existing glazing in adjoining buildings. Edges shall be cut clean without chipped edges.

2. **Plate Glass** (PG): ¼" clear polished plate or float glass, q3 glazing quality, except as noted otherwise. Sheets with narrowest dimension over 72" and tempered sheets with narrowest dimension over 48", shall be q3 glazing quality not less than ⅜" thick.

3. **Tempered Glass** (TG): Plate glass fully tempered to meet CPSC Standard 16-CFR, bearing permanent mark indicating grade and manufacturer. Tempering shall be produced by a horizontal type furnace, without tong marks.

4. **Laminated Glass** (LG): Provide where and as scheduled, and as Contractor's option to substitute for ¼" thick non-tinted tempered glass. Except as noted, LSG shall be clear ¼" thick float quality with .060" vinyl interlayer, meeting CPSC Standard 16-CFR. Each piece shall bear a permanent mark indicating its grade and characteristics. Laminated glass shall carry 5-year warranty against delamination.

5. **Insulating Glass** (IG): Equal to Viracon with ½" airspace (bronze anodized spacers), ¼" annealed glass inner lite, ¼" annealed lite, tint to match existing buildings, producing a shading coefficient of at least .57. Product shall have been tested to meet ASTM E-773 and ASTM E-774 must be CBA certified by IGCC and carry a 10-year factory warranty.

   Insulating glass seals shall be certified to withstand project structural loading requirements.

C. GLAZING

1. **General**: Employ best grade products of Tremco, Pecora, DAP, or Gipson-Homans. Material and application as recommended by manufacturer and as specified below. Coordinate work with glazing preparations made by window manufacturer.

2. **General Workmanship**: Per FGJA recommendations. Do no work when temperature below 40 degrees F or in damp weather. Glazing surfaces to be clean and dry. Glaze sash and doors in closed position and do not operate until compound has set. Steel and wood rabbets and stops shall be primed before glazing. Windows shall be erected and adjusted before work

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begins. Compound surfaces shall be free from surface cracks and show no breaking of bond to glass or frame for at least one year after acceptance of work.

3. **Stop-glazed Hollow Metal Frames**: Glaze with skinning type Butyl caulk glazing compound. Install sheets over 3 sf on setting blocks at quarter points so as to maintain 3/16" minimum edge clearance all around. Maintain ⅛" minimum interior and exterior face clearance (by use of spacer shims on all lights over 50 united inches).

   If glazing rabbet does not permit minimum clearance, or if exterior glass is over 72" in either direction, employ DAP Flexised rubber base compound.

4. **Wood and Metal Doors**: To be hung and adjusted with glazing surface primed before proceeding. Install glass with screw applied stops and Butyl Caulk glazing compound and wood or metal stops as detailed. Allow minimum ⅛" edge clearance and ⅛" face clearance (both faces) all around.

5. **Insulating Glass**: Follow manufacturer's recommendations. Furnish a 3-year warranty in writing to replace any glass which loses it's seal within three years of building acceptance.

End of Section

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SECTION 0925

GYPSUM DRY WALL SYSTEMS

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: Include material and labor for installation of complete dry wall partition and ceiling systems, including gypsum board, moisture resistant gypsum board behind thin set ceramic tile, sound insulation, rated wall framing. Include installation of access doors furnished under other Sections. Except where exposed items are specifically noted, arrange work to receive and conceal pipes, conduits, ducts, etc.

   Wood blocking, hollow metal frames and thermal insulation are specified under other Sections.

   Include sealing of all penetrations by other trades where airtight plenum or fire rating is required. Sealing of penetrations by other trades in fire walls is specified in Section 0727.

   The application of a sealer-equalizer coat on all new GB surfaces to be painted is included in this Section.

3. **Assistance to Other Trades**: Cut and/or frame all openings for other trades (excluding small holes for pipes, conduit, etc.). Where a cut impairs the strength of any member, add material to compensate. Coordinate any variations in wall thickness with hollow metal contractor.

4. **Catalog Data**: Submit for approval together with samples of main framing members, UL test data, etc.

5. **Sequence of Operations**: Do not erect rated partition metal framing until material can be protected from standing water. Erect no GB until the area is completely weathertight.

B. FRAMING

1. **Typical Material**: Typical material (wood framing) is specified in Section 0610. See below “E. Fire Partitions” for “CH” metal studs.

C. GYPSUM BOARD GENERALLY

1. **Acceptable Manufacturers**: USG, NGC, GP or CertainTeed.

2. **Building Conditions**: All openings closed; maintain temperature between 55 Degrees and 75 Degrees F, continuously until all materials are dry. Provide heat or ventilation to remove excess moisture. Before proceeding, verify that wood blocking, rough-ins and other items to be covered over are in place.

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3. **Storage and Handling**: Do not deliver material until just prior to erection. Protect from wetting. Stockpile on adequate runners flat on floor, leaving original wrapping until ready for actual use. Take care not to overload structure.

D. GYPSUM BOARD (job finished)

1. **Scope**: Typical wall application except as noted.

2. **Material**: NGC gypsum wallboard meeting ASTM C1396, 4 feet wide x ½" thick sheets. Board at exterior walls to be Gold Bond XP or USG Mold Tough Gypsum wall board or equal. Lengths for wall board to equal room heights. Typical boards to have tapered edges to allow for finishing.

   Where scheduled (GB-M) provide Gold Bond XP or USG Mold Tough or equal board meeting ASTM C630 in all toilets and janitor areas. Employ Type X board where fire rating is required.

   Provide Shaft-Wall construction for horizontal and vertical construction where indicated on drawings. Provide system to produce fire rating indicated on drawings.

3. **Screws**: Type S-12 Bugle Head (or other design which will minimize paper burrs) self-tapping drywall screws of a length at least ½" greater than total thickness of wallboard being fastened. Employ self-drilling type at heavy gauge studs. Space not to exceed 12" oc on ceilings, 12" oc along edge wall bearing, 16" oc on intermediate wall bearing, not less than ⅜" from edges (spacing shall not exceed that called for in applicable fire test data or manufacturer's recommendations).

   At door frame double jamb studs, apply screws 8" o.c. along each stud.

4. **Erection on Wood**: Apply on walls vertically, all joints on bearing. Where gypsum board above ceiling (10'-0" A.F.F., contractor have option to switch to 54" wide ½" run horizontal where indicated on drawings. Screw along each bearing 8" o.c. on walls, with 1¼" Type W screws.

5. **Behind Ceramic Tile**: ⅝" thick Gold Bond XP or USG Mold Tough gypsum board applied to framing with 1¼" type S-12 Bugle Head dry wall screws spaced 8" o.c. along supports, all edges on bearing. Coat all raw edges and spot screw heads with water resistant tile adhesive. Treat joints beyond tiled area in conventional manner.

6. **Expansion Joints**: Where unbroken gypsum board runs in walls exceed 30' in length (in runs with door or window openings and exceeding 20'), provide expansion joints so as to limit runs to 20' maximum. Generally, locate joints in pairs above each jamb of doors and similar openings. Where no opening occurs in an overrun, space joints as equidistant as is practical.

   Divide ceilings (of over 400 sf or 30' length) into sections not exceeding 150 sf. Limit undivided exterior ceilings to 16' runs and 100 sf. Arrange patterns so that joints intersect duct openings and other points of weakness in system.

   Expansion joint strips shall be equal to NGC Type EZ or USG #093.

   Each edge shall occur on a separate bearing stud spaced ¼" apart and secured with½" staples 6" o.c. per manufacturer's directions. Where such joints occur in fire or sound rated

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partitions, space bearing studs ¾" apart and fill space between studs with safing insulation before finish is applied.

7. **Metal Accessories**: Reinforce external corners with 1¼" x 1¼" standard galvanized corner beads with flanges coated with bonding agent. Apply steel casing beads (USG 200 series) where gypsum board dies against masonry, at edges of building expansion joints and elsewhere indicated. Set edges to true line and fasten on 7" centers. Using bead for a screed, cover flanges with bedding compound and apply as many subsequent coats of compound as necessary to bring out to a smooth flush finish.

8. **Finishing**: Employ bedding and topping compound and NGC "**Proform**" perforated tape along joints. Apply bedding compound to joints and nail heads and allow to dry 12 hours. Then apply a second layer of compound and embed tape over joints; allow to dry thoroughly (normally 24 hours). Then cover tape with coat of topping and spread out 3" each side of tape; feather edges. After preceding coat is dry apply a second coat spreading and feathering out 3 inches beyond preceding coat.

   Where open joints of more than $^{1}/_{16}$" occur, including edges of boards with rounded or beveled corners, prefill joint with special chemical-hardening-type bedding compound, prior to bedding of joint tape.

   At fire rated partitions finish joints for entire height of wall; otherwise joint finishing may be discontinued 12" above the ceiling. Where joint finish is discontinued, joints shall be cross-taped to prevent joint cracking.

   Reinforce wall angles with tape folded and embedded, with at least one additional feathered coat of topping. Screw heads and dimples shall receive at least 3 coats. Sand coats as required, without roughing face of wall board. Leave surface smooth and uniform, without any blemish which will show through decoration.

   Sealer-equalizer Coat: On new exposed walls and ceilings to be painted apply USG's Sheetrock First Coat or Tuff Hide. Product shall be applied by roller and/or brush per manufacturer's instructions by skilled painters (experienced employees or contracted painters). Use only the ready-mixed product direct from the container (DO NOT DILUTE).

E. FIRE PARTITIONS AND SHIELDS

1. **Fire Rating**: Indicated partition assembly shall produce the fire rating noted, (UL Design U415, System "A" as tested per ASTM E119. Employ ⅝" fire retardant gypsum board, fire stopping, perimeter caulking, etc. or combination thereof, as required to produce the rating indicated. If tested assemblies other than those indicated are proposed, submit supporting test data. Where hollow metal frames occur, select an assembly which does not change the typical wall thickness (advise if not possible). Do not employ studs or facing of lesser thickness, spacing, etc. than that shown.

   Penetrations of rated walls (i.e. electrical panels, FE cases, etc.) shall be lined internally to maintain the integrity of the fire rating. Small penetrations (i.e. electric boxes) may occur without lining but must occur in only one face per stud space; coordinate with electrical contractor.

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Fire-rated partition is noted on drawings, partition shall be rated one hour as indicated by legend.

2. **General One-Hour U415 Assembly**: Where indicated install layer of Fire-Shield board with 1" fire shield shaft liner and 20 gauge minimum "CH" studs at 24" o.c. maximum. One-hour vertical shaft wall assembly. Screw apply as noted for typical board unless additional required by assembly. Tape and finish joints to extent requred by UL rated assembly. Fill all penetrations and other openings in the surface so as to maintain the fire barrier. Provide R-10, 2½" rock wool insulation in stud cavity.

F. SOUND TREATED PARTITIONS (indicated by legend on Reflected Ceiling drawing)

1. **Sound Rated Partitions**: Construct as detailed and hereinbefore specified, 10'-4½" height of floor. Take care that all penetrations are completely sealed. Where FE cabinets, electric panels, etc. occur line the recess with additional layers of gypsum board.

   Coordinate work with electrical sub so that outlet boxes do not occur in opposite wall faces within a single stud space. Where such arrangement is not practical, separate the boxes with layers of gypsum arranged internally within the stud space.

2. **Acoustical Sealant**: Apply only to concealed spaces. Gun a full bead along the perimeter of each section of wall, and completely around outlet boxes, pipes, ducts, etc. which penetrate the facing board on each site.

3. **Sound Insulation**: Install in all walls noted as "sound walls" and fire partitions full height.

   USG Thermafiber SAFB or Owens Corning Thermafiber mineral wool blankets, 16" or 24" x 48" x 2½" thick (double layer in 2x6 partitions), 2½ pound/cf density with flame spread 15, smoke development 0. Wedge carefully between studs and wire in place so no voids occur.

   Equal products shall be submitted 10 days prior to bids, others approved will be issued by Addendum. Cut blankets to fit tightly between studs and other adjacent members and at penetrations through the blankets. Butt ends of blankets tightly.

   Blankets shall cover all items projecting into the stud space, such as electrical boxes, reinforcing members, and the like. Secure blankets (or wire) with adhesive recommended by the blanket manufacturer.

End of Section

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SECTION 0931

HARD TILE WORK

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: Provide tile in areas as scheduled and detailed. Wall and floor tile will not be required behind or under built-in equipment unless noted otherwise (but depressed slabs under cabinets must be filled with concrete and finished level with finish floor).

3. **Acceptance of Surfaces**: Examine all surfaces and report any deficiencies before starting work. Thereafter assume responsibility for satisfactory work.

4. **Workmanship**: First class with square corners and surfaces to true plane. Follow TCA recommendations; meet TCA standards. Dress to floor drains. Join carefully and closely to trim, fixtures, electrical boxes, etc. Cut and drill neatly as required; splitting of pieces not permitted. Maintain work areas at 50° F or above during laying and curing period. Completed work shall be free of hollow sounding areas, and loose, cracked and defective tiles.

5. **Floor Levels**: At juncture of floor with different material, butt tightly with top surfaces level, forming a neat junction without threshold strips unless noted otherwise. Where noted “AET” provide extruded aluminum equal to Schluter Systems model “Reno-U” in color as selected, 2” wide (tapered portion) thickness required for setting bed and tile thickness, with tile edge centered under door.

6. **Bath and Toilet Accessories**: See Section 1080.

7. **Substrate for Wall Tile**: Set tile on moisture resistant gypsum board as specified under other Sections. Substrates by other trades must be clean and accurate within tolerance (⅛” in 8 feet) to facilitate proper results of thin-set work.

8. **Attic Stock**: Provide one full undamaged box of each type and color of hard tile for future repairs by the owner. See Section 0160 for delivery instructions.

B. CERAMIC TILE

1. **Acceptable Manufacturers and Grade**: American-Olean, DalTile or Interceramic, meeting ANSI A-137.1 Standard Grade, all delivered to job in unbroken grade-sealed containers.

   Floor and wall tile must be the product of the same manufacturer.

2. **Colors and Patterns**: Standard stock colors and patterns as selected.

   Selections will be limited to three color schemes. Trim shapes to be same color as field tile.

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3. **Floor Tile Material**: 2” x 2” x ¼” thick factory mounted unglazed ceramic mosaic tile with cushion edges, sizes as selected. Provide 6x6 cove base.

4. **Setting Floor Tile**: (slab on grade): Employ TCA Method F113 (Thin set), using latex-portland cement mortar (ANSI A118.4), potable water and latex-portland cement grout, acid and mildew resistant, in color as selected from standard colors. Carefully follow manufacturer’s directions and recommendations for installation, including curing.

5. **Floor Expansion Joints**: Provide so as to coincide with construction joints in slab; so as to limit area to 200 sf; between floor tile and base where tile is bonded directly to slab; and as otherwise shown on drawings.

   Follow TCA details and specifications for both wall and floor expansion joints.

6. **Setting Base Tile**: Install tile over gypsum board. Follow TCA Method W242 using organic adhesive for installation over gypsum board. Point joints with latex-portland cement, acid and mildew resistant grout forced in so that full depth of joint is filled then rake back to depth of cushion edge removing all mortar from face.

7. **Cleaning**: Clean surfaces as work progresses, washing with sponge and then polishing with dry clean cloths. Cover floors with heavy paper before other trades have access to the area. Mild acid solution may be used on floors if necessary but not on glazed tile.

End of Section

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SECTION 0950

ACOUSTICAL CEILINGS & SURFACES

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: Include areas as scheduled plus surfaces indicated on drawings. Include other work as noted hereinafter. Refer to Section Insulation for thermal insulation above ceiling.

   Include vertical or angular surfaces where a ceiling or soffit terminates other than against a wall or furred face by another trade.

   Where two different ceiling/soffit surfaces juncture at different heights, the material of the lower surface shall form the vertical surface enclosure between the two (unless detailed otherwise).

3. **Catalog Data and Samples**: Submit for approval covering acoustical material and suspension systems. Include laboratory acoustical test results. Upon request furnish sample of two boards of each type required, assembled with suspension system so as to demonstrate all components. Include UL fire-rating data and complete instructions relating to each assembly prepared.

   Systems not named and requesting prebid approval, must submit at least 10 days prior to the bid date.

   Submittal shall include verification that ceiling components are properly coordinated with mechanical and electrical equipment, and that all trades are aware of the requirement.

B. CEILING MATERIALS

1. **Boards and Tiles Generally**: Deliver in original packages with seals unbroken, and only after proper temperature and humidity have been obtained. All material shall have an ASTM E-84 Class A flame spread rating; cartons of rated boards must bear a UL label indicating compliance. Except where longer period is stipulated, dimensional stability shall be warranted for two years, 30 years when tile and grid are supplied by the same manufacturer.

   Cut slightly over-sized boards from 24” x 48” panels so as to avoid pieces smaller than 6” wide.

   Furnish types as specified below or equivalent by USG, or CertainTeed. Prebid approval of any other brand is required.

2. **Suspension Systems Generally**: All systems shall support the indicated assembly with a maximum deflection of 1/360 of the span. Furnish types and features as indicated below, or equivalent products of USG, Gordon, or Chicago Metallic. Before bidding, verify that boards and specified grids are compatible.

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3. **Attic Stock**: Provide one or more full undamaged cartons of each type of ceiling board or tile for future repairs by the Owner. The quantity of each type shall be at least 1% of ceiling area represented by that color or design. See Section 0160 for delivery instructions.

4. **Grid Edges and Special Features**: Except as noted otherwise, fit edges into white metal channel shaped, hemmed wall molding of .021" minimum thickness, matching grid system in material and finish.

5. **Typical Ceilings (Mark ABD)**: Employ 24" x 24" x ⅝" square-edge, mineral-fiber panels in fissured design, white color, NRC range .50 - .60, USG "Radar Climaplus" (Item 2210) equal by Armstrong or CertainTeed will be accepted upon approval.

6. **Suspension System**: Shall be a zinc-coated cold-rolled steel exposed Tee-grid (15/16" face) system in satin white finish equal to USG Donn DX. Main T-runners to be DX-24 Intermediate Duty .015" thick members spaced 48" oc; provide in maximum standard lengths with no piece shorter than 12" and all joints made with factory splices. 4'-0" long cross tees shall be DX-422. Cross tees shall be factory cut to special or standard lengths as required (except at border conditions around perimeter of room).

7. **Densglass Overlay Panels**: Provide precut ⅝" Densglass board panels and install (above scheduled ceiling board) over ceiling panels for fastening diffusers, lights, etc.

C. INSTALLATION OF CEILINGS

1. **General Provisions**: The building shall be closed to the weather, with all wet-trade work complete and dry. During and subsequent to installation, maintain all areas within a temperature range of 60 to 80 degrees F with RH not exceeding 80%.

2. **General Workmanship**: Installation shall meet ASTM C636 and meet the recommendations of the board and grid manufacturers. Where a specific edge treatment is not stated and a choice exists, provide the more esthetically desirable method. Field rabbeting of border and special pieces must be done expertly so that fit appears to be as neat as factory rabbets.

   Install ceilings level within a tolerance of 1 in 500, and straight within a tolerance of 1 in 1000 (kinking hanger wire to achieve leveling will not be allowed).

3. **Layout**: Fit units in string joint pattern symetrically with walls and so that light fixtures, columns, etc. fit properly into the pattern. Avoid borders less than half-size. Consult Architect regarding layout before proceeding. Refer to reflected ceiling plan. Report any partitions which are not square or true to line.

   Install boards so that face pattern runs one direction in any given area.

4. **Observation of Construction**: Facilitate observation of overhead construction by delay of installation of lay-in type boards. Install in the normal course of work all border pieces, specials, those receiving mechanical and electrical devices, those made difficult by limited headroom, and approximately ⅔ of the balance. Do not install the remaining boards until after the final inspection. Omitted board spaces shall be scattered above the ceiling area.

5. **Electrical Fixtures and Grilles**: Frame openings as required to support fixtures, etc. Two opposite edges of all such devices must bear on main runners or members of equivalent size.

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Where required, set framing members to receive troffer mounting brackets as specified in Electrical Section. Install fixture frames, trim, etc. as specified hereinbefore.

Where exit signs, smoke detectors, signal lights and non-modular grilles occur, glue ⅝" Den Glass Board to top side of the tile receiving the device.

6. **Supporting Wires**: Support main grid members with #12 Gage prestraightened galvanized wire installed within 10 degrees of vertical on 4-foot intervals (shorten interval if necessary to work out with overhead members). Place supporting wires within 18" of intersecting walls. Provide extra wires adjacent to light fixtures, ceiling grilles, and other items requiring additional support, as required to support the item and to limit deflection of the grid to 1/360 of span. Provide heavier wire and shorten interval if required to meet fire rating.

   Attach wires to structural members only; in no case anchor to mechanical or electrical components. Lay out main tees so as to avoid ducts directly overhead. Where ducts are unavoidable, provide underslings of 1½ cold rolled carrying channels to transfer weight of ceiling system. Hang underslings so as to prevent twisting out of vertical; where span exceeds five feet provide 2" channels, or larger, as required.

7. **Edge Molds**: Secure molding to wall on 16" centers with non-corrosive fasteners as recommended by manufacturer; space out or place extra nails so mould is anchored within 2" of each main or 4-foot cross tee bearing point or joint in mold. Ends of mold shall be butted - not lapped. Notify Architect if wall surfaces are wavy or present any other condition detrimental to application of mold.

8. **Cleaning**: Following erection, clean all discolored surfaces. Replace any damaged units.

End of Section

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SECTION 0965

RESILIENT FLOORING

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: Work to include all resilient flooring work, including rubber base and other related items specified hereunder.

   - Flooring not required under built-in cabinets with closed bases.
   - Metal edge strips to terminate tile work are specified under other Sections.
   - Provide rubber base for Conference Room cabinets.

3. **Acceptance of Surfaces**: Examine all surfaces and report any deficiencies before starting work (floor surfaces shall not vary more than ¼" in any 10 foot length, nor vary more than ⅛" at door frames or other point where variation may become obvious).

4. **Heating**: Maintain floor level temperature of all rooms at 65° F at least 48 hours before, during, and not less than 48 hours after installation work. Store material in heated area for 48 hours prior to installation. Thereafter, maintain a minimum temperature of 55° in areas where work is completed.

5. **Sequence of Work**: Install resilient flooring after lay-in ceilings, wallcovering and painting work is substantially complete.

6. **Floor Levels**: Floors of different materials shall butt tightly with top surfaces level. Buildup surfaces slightly as required to dress out neatly with adjacent materials.

7. **Workmanship**: First class, with lines straight and true. Avoid soiling walls and adjacent areas with adhesive.

8. **Attic Stock**: Provide one full undamaged box of each of each type and color of LVT for repair by the owner. See Section 0160 for delivery instruction.

B. RESILIENT FLOORING

1. **Colors and Patterns**: Standard colors as selected, not exceeding 3 for the project. No borders, feature strips or divider strips required.

2. **Installation and Layout**: Lay with tight joints, starting at center of corridors and major rooms and working toward walls, taking care to course through openings into other areas. Run patterns all same direction, as directed. Where tile is employed, compensate for variations in shade by shuffling tile from several cartons. Scribe to walls, doorjambs, etc., not covered by base. Avoid small cuts. Fit under metal thresholds and saddles. After setting roll in both directions until flat and well seated. Consult with Architect before proceeding.

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3. **Concrete Surface Preparation**: All surfaces thoroughly clean and dry. Grind out ridges, trowel marks and other surface projections. Level low areas with underlayment equal to Ardex K-55 (with P-51 primer). Fill all cracks. If alkaline conditions are present, if slab is dusty or if moisture is present, prime with Top Coat ll by William Bird & Company, Inc. 800-922-2287 or as recommended by manufacturer.

4. **Moisture Test** (new concrete): After building is dried-in, HVAC is on and concrete floor slab surfaces have been cleaned of dirt and dust, an independent lab shall test slab for moisture using an annydrous calcium chloride 60–72-hour test meeting ASTM F-1869. The lab will conduct three tests for the first 1,000 sf of each floor and thereafter conduct one test for each additional 1,000 sf of floor area. No floor finish material shall be applied until the results meet industry standard of three pounds per 1,000 sf during 24 hours. The lab will document and submit the results to the Architect. Selection of lab and payment of cost shall be as indicated in Division One. The testing procedure shall be coordinated with the General Contractor in a timely manner.

5. **Adhesive**: Unless otherwise recommended by manufacturer, employ asphalt cut-back or water-based/rubber resin type for vinyl composition; employ water-based/rubber resin adhesive in the field and a two-part epoxy adhesive at the seams and field cuts of sheet vinyl.

6. **Reducer Strips**: Provide at edges where tile work terminates. To be continuous vinyl strip, 1⅝" wide, solid color as selected, similar to Mercer Plastics Co. #710, with self-stick back. (Where tile dies against another material such as quarry or ceramic tile, butt tightly with top surfaces level, without a reducer strip).

7. **LVT Cleaning**: After tile has sufficiently seated itself (approximately 14 days after laying), thoroughly sweep or vacuum the flooring to remove all loose dirt and grit. Follow the flooring manufacturer's instructions for cleaning new flooring. Only use equipment approved by the manufacturer for cleaning the floors. Note: The cleaning process by need to be repeated on heavily soiled floors.

8. **Laminated Vinyl Tile (LVT)**: Tarkett's True to Form Series as scheduled on drawings. Installation and adhesive (Tarkett #975) to be in strict accordance with manufacturer's instructions. Equals by Shaw and Patecraft, or other if approved prior-to-bid (See Section 0160).

Series:	True to Form Wood
Classification:	ASTM F1700 Class III Type B
Total Thickness:	0.120" (3.0 mm)
Wear Layer Thickness:	32 mil (0.5 mm)
Finish:	Techtonic®
Edge Treatment:	Square (SE)
Emboss:	Quary (QU)
Warranty:	25 Year Limited Commercial Wear Warranty
Size:	12"x36"
Color:	To be determined (minimum of 3)
Style:	To be determined (minimum of 3)
Pattern	To be determined

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Transitional Strips: Provide manufactured transition strips equal to Tandus/Centiva “METALEDGE” at all change or flooring materials and door thresholds. Style and Color to be selected.

C. RUBBER COVE BASE

1. **Material**: Molded vulcanized rubber set-on type cove base in standard colors as selected, ⅛" thick x 6" high with rounded top and ½" wide lip at bottom; Musson, Burke, Johnsonite, Robbins, Flexco, or equal. Provide preformed moulded external corners and end stops.

2. **Installation**: Apply boxed material in full standard lengths as practical, worked out so that no piece occurs shorter than 24".

   Generally, apply coil material in full lengths from corner to termination; minimal joints to prevent waste will be permitted, but no splice piece shall be shorter than 24".

   Employ cove base adhesive recommended by manufacturer. Completed work shall be well secured in place without waves or buckles. Scribe accurately to abutting surfaces. Cope internal corners. Make joints hairline accurate. Roll entire surface with handroller and then press toe firmly to wall using a flat wood strip. Where base terminates on a flush plane use preformed end stop.

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SECTION 0990

PAINTING

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: Include all surfaces required for complete and finished job unless expressly eliminated. Work shall include, but is not necessarily limited to, the following:

- Typical wood, gypsum board and ferrous metal surfaces
- Mechanical piping (air, gas, hangers), etc., in typical finished areas (see below)
- Gas piping where exposed on exterior and interior, including meter and supports
- Galvanized iron roof vents, downspouts, and gutters (PVC type roof plumbing vents)
- Steel (not cast iron) trench and pit covers in yard Painted wainscots (as scheduled)
- Preservative treatment for millwork
- All existing previously painted surfaces where modified, soiled or damaged as a result of this work.

3. **Work Not Included**: The following portions may be left unpainted, or work is specified under other Sections:

- Exterior roof overhang and canopies
- Interior and exterior caulking (see Division 7)
- Glass and acoustical ceilings
- Stainless steel and typical non-ferrous metal surfaces (galvanized surfaces shall be painted)
- Piping, tanks, etc. in Mechanical Rooms (see Mechanical Division)
- Backboards for electrical, sound and/or telephone equipment (see Electrical Division)
- Concrete floors (see Concrete Division for hardening treatment)
- Factory applied prime coats (except touching-up and finish coats)
- Factory applied finish coats (except touching up)
- All surfaces in attic, joist, crawl, pipe and duct spaces
- Lettering and pavement striping (see Section 0991)
- Roll up doors
- Factory finished components of pre-engineered metal building

4. **Quality of Work**: First class in all respects. The number of coats specified is the minimum required; the Contractor shall gauge thickness of coats, or provide additional coats, to produce hiding, color depth, scheduled gloss and to comply with manufacturer's recommendations.

5. **Acceptance of Surfaces**: Do not begin until surfaces are in proper condition. Report deficiencies. Assume responsibility for finish surfaces after application of prime coat.

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6. **Colors**: Color schedule will be furnished by Architect, made up where possible from standard color chips of manufacturer chosen. However, selection will not necessarily be limited to any single manufacturer's stock colors, nor by the number of colors selected for any area. Upon request, prepare sample paddles of selected colors, and assist Architect in illustrating color selections to the Owner. Refer to Section 0160 Materials.

   In large mechanical and electrical equipment areas and other hazardous spaces, the general color schedule may be supplemented with special instructions for the application of safety colors on floor, low beams and pipes, belt guards, fire extinguishers, place mats, etc. Secure instructions before proceeding.

7. **Inspections**: Secure approval of each coat of material before the succeeding coat is applied. Otherwise, no credit for the coat will be given.

8. **Submittals**: Prior to beginning any work, the painting contractor shall submit a schedule of application, based upon the one contained herein. The schedule shall list the exact products as they appear in the schedule with the exact (proposed) products listed on the same line. Also include (if available) a products comparison chart by the manufacturer of the proposed products.

9. **Sample of Workmanship**: As an initial step, finish one complete room of each color scheme required. Upon approval, those rooms shall serve as a standard of quality for color, materials and workmanship.

B. GENERAL WORKMANSHIP

1. **Temperature, etc.**: Do no exterior painting in direct sun, during damp weather, or when temperature is below 50° F or is expected to fall below freezing within 24 hours. Maintain building interior continuously at 65° F or above (by building heating system if possible) during entire period of painting work; prevent wide variations of temperature which might cause condensation on fresh paint. Do not apply finish to surfaces made hot by sunlight.

   Thoroughly broom clean and dust the area, floor, etc. before starting the painting therein. After painting has begun in the area further cleaning must be done with commercial vacuum cleaning equipment. Provide adequate illumination in all areas where painting is in progress.

2. **Applications**: Per manufacturer's directions. All work by skilled mechanics. Spread evenly and smoothly, flowing without runs, drops, sagging, brush or roller marks. Keep material free of lumps, skins and foreign matter, well stirred while being applied. Allow each coat to dry as stated by manufacturer before a successive coat is applied. Cut in neatly around glass and at other edges where materials or colors change.

   Where grille or other surface makes brush painting impractical, employ spraying equipment. Application on typical gypsum board surfaces shall be by brush or roller: application on wood and metal surfaces shall be by brush only.

3. **Undercoats**: Tint with color of finished shade, but each coat shall be a perceptibly different shade.

4. **Spot Finishing**: Not allowed; refinish whole walls or ceilings where work is damaged or is unsatisfactory.

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5. **Hardware, Device Plates, etc.**: Remove locksets, escutcheon plate, roses, strikes, closers, holders, push and kick plates, and device plates and replace after painting work is completed. Protect devices that remain.

   Remove electrical panel box covers, paint separately if scheduled, and replace after paint on cover and wall is dry.

6. **Labels**: Carefully cut around and do not paint over UL labels, identification plates, performance ratings, etc.

7. **Cleaning**: After completion of work, clean off all paint spots and stains from floors, woodwork, exposed brick, glass, metal, hardware, etc., leaving building in perfect condition.

8. **Protection**: Avoid spattering or otherwise damaging vegetation, walks, and all surfaces inside and outside the building. Utilize drop clothes as necessary.

C. PREPARATION OF SURFACES

1. **General**: Surfaces shall be clean, dry, smooth, free of dust, scratches, hammer, planer marks, or any material which will adversely affect adhesion or appearance of finish.

2. **Woodwork**: Sand until smooth and free of raised grain or other imperfections before application of first coat. Slightly round all exposed edges. Thereafter sand between coats to produce smooth even finish. Scuff-sand MDO plywood face to receive paint. Dust off after each sanding.

   Before priming wash pitch streaks and sappy places with mineral spirits; when dry coat with shellac or stain stopping varnish and then sand smooth. After application of prime coat, fill nail holes and minor blemishes with lead putty or plastic wood; putty for stained work shall match stain.

3. **Ferrous Surfaces**: Wash with mineral spirits to remove dirt and grease. Sand scratches, welds, and rust spots to the base metal and touch up with metal primer. Thereafter lightly sand the entire surface as for woodwork. Treat galvanized surfaces with compound designed for that purpose.

4. **Gypsum Board**: Sand smooth and dust off taped joints. Fill minor irregularities with spackle and sand to smooth, level surface. Avoid raising nap of paper.

D. MATERIALS GENERALLY

1. **Acceptable Manufacturers**: PPG Paints, Inc.(Basis of Design), equal by Sherwin Williams, or Benjamin Moore. Where particular types or brands are mentioned, verify before bidding that an equal product is available from the chosen manufacturer. Use same brand of paint, stain, varnish, etc., on any one phase of work throughout building.

2. **Approval Required**: State by letter, which manufacturer’s products are proposed for use and list by brand name the exact product for each specific application. Upon completion of work, certify in writing that said brands and types were employed.

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3. **Delivery and Storage**: Deliver all materials to job in original sealed labeled containers at least 3 days before proceeding and secure approval thereof. Store material in a single assigned room and keep area clean at all times; remove all oily rags, etc. from building every night. Puncture empty containers and keep on job until completion of painting work.

E. PRIMING, BACKPRIMING, SEALING, ETC.

1. **Interior Millwork** (including cabinetwork, wood base, wood trim, doors, etc.): Seal backs, ends and bottoms before erection. Chalk and tack board trim shall receive all coats before boards are set (loose inner mould may be given last coat after boards are installed).

2. **Steel Glazing Stops and Rabbits**: Prime all sides before glazing.

3. **Glazing Compounds** (except on aluminum sash): Paint after the compound has set but not later than 4 weeks after glazing. The paint film must extend up to and touch the glass surface.

F. SCHEDULE OF APPLICATIONS (New Work)

NOTE: Refer to Part A of this Section regarding number of coats, etc. as indicated below. Catalog numbers are from PPG Paints, Inc. Paints unless noted otherwise.

1. **Typical Exterior Iron and Steel**: Touch-up prime coat with Multi-Prime 4160 Alkyd primer. On rough surfaces apply a second primer coat. Follow with two coats HPC Industrial Alkyd 4308 gloss enamel 4306 Semi-Gloss. (Steel and hollow metal frame windows shall have two coats before glazing

2. **Galvanized Iron and Steel, Piping**: Prime with one coat of Multi-Prime 4160 Alkyd primer. Two coats HPC Industrial Alkyd 4306 Semi-Gloss.

3. **Steel Subject to Traffic** (Bollards, Handrails, etc.): Touch-up shop prime coat. Follow with two coats HPC Industrial Alkyd 4308 gloss enamel.

4. **Interior Iron and Steel** (except prefinished items and steel subject to traffic): Touch-up prime coat with Multi-Prime 4360 primer. Finish with two coats HPC Industrial Alkyd 4306 Series semi-gloss or Pitt Tech Plus 4216 HP Latex Semi-Gloss DTM Industrial Enamel.

5. **Interior Piping, etc. subject to heat**: Apply two coats PPG Heat Coat 335 silicone acrylic heat resistant coating.

6. **Gypsum Board** (typical interior areas): After application of first coat (filler equalizer) specified in Section 0925, prime with one coat Max Prime 6-4 High Build Primer then finish with two coats 6-5310 Speedhide Zero Interior Latex Paint Eggshell.

   Do not apply any paint before the filler equalizer is applied, see Section 0925.

7. **Gypsum Board** (Toilet and Janitor Closet): After application of first coat (filler equalizer) specified in Section 0925, prime with one coat Seal-Grip 17-9801 vapor barrier primer. Finish with two coats 6-5510 Speedhide Zero Interior Latex Paint Semi-Gloss.

   Do not apply any paint before filler equalizer is applied; see Section 0925.

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8. **Typical Interior Wood**: Prime with Seal Grip 17-951 Finish: Two coats 6-5510 Speedhide Zero Interior Latex Paint Semi-Gloss.

9. **Inside of Closed Cabinets, Inside and Underside of Drawers and Underside of Counter Tops**: Two coats Deft Sanding Sealer DFT60 sanding sealer.

End of Section

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SECTION 0991

LETTERING AND PAVEMENT MARKING

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

B. LETTERING

1. **Identification of Fire Walls**: In accordance with IBC, clearly mark all corridor partitions, smoke walls and firewalls above the ceiling with stenciled or hand lettering at least 1" high and reading "Fire and Smoke Barrier - Protect all Openings". Such identification shall occur on both sides of walls at a spacing not to exceed 25 feet, and at least once on any such wall in a given room regardless of length.

2. **Scheduled Lettering**: By skilled sign painter, with work executed in style, color and design as directed. See details and schedules on drawings.

C. TRAFFIC PAINT

1. **Traffic Striping** (on asphalt and concrete pavement): Apply not sooner than 14 days after asphalt is laid. Sweep surface clean (wash with water if required). Before proceeding determine that area is dry and free from bleeding asphalt. Lay out parking stripes as indicated, generally maintaining equal spaces between 9 and 10 feet wide. Apply paint with brush and template, or with mechanical marking equipment. Each stripe shall be 4" wide, of non-reflective yellow paint meeting ALDOT Section 856, Class I, Type B permanent paint and applied at rate not less than one gallon per 100 sf.

   In areas, which must be put into service earlier than two weeks after asphalting, provide temporary striping consisting of 2" paint spots on approximately 30" centers.

2. **Handicap Symbol**: Template apply universal handicap symbol (30" high) to parking spaces as indicated, following same procedure as traffic striping. Color to match Sherwin Williams # 6795 Major Blue.

3. **Safety Stripe**: Shall be by Owner.

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SECTION 1000

MISCELLANEOUS BUILDING SPECIALTIES

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Submittals**: Submit applicable catalog data and shop drawings for approval.

B. MISCELLANEOUS SPECIALTIES

1. **Toilet Accessories**: Under Toilet Accessories Section 1080.

2. **Mop Holder**: Equal to Bradley Model 9954 with four serrated cam type cadmium plated holders mounted on 36" long channel strip. Channel shall be fabricated of 18-gauge type 304 stainless steel with #4 finish.

3. **Fire Extinguishers and Brackets**: By Owner.

4. **Fire Extinguisher Case** (Alternate #2): Equal to Larsen Model 2409-6R, semi-recessed, 9½" wide x 24" high x 6" deep with frame (designed for 2½" recess), with 18-gauge enamel finished steel case and natural anodized aluminum door and frame. Door shall have matching brass pull, piano hinge, tension latch, and shall be full glazed with ⅛" plexiglas. Install cabinet so that top of latch is 4'-0" above finish floor.

   Equal products by J. L. Industries, Muckle, or others will be accepted.

5. **Fire Extinguisher Sign**: Equal to Seton's Model 91148 plastic sign. Furnish 1 at each fire extinguisher case and designated bracket locations.

6. **Toilet Partitions**: See Section 1016.

7. **Interior Signs** (Alternate #2): ADA compliant, photopolymer, monolithic, tactile signs equal to the ASI Asintouch Series. Lettering and graphics shall be precisely and uniformly produced, carefully spaced and aligned for optimum composition. Translation of copy into braille shall be the responsibility of the manufacturer. Equal products by APCO, AGI, Interface, Bell, Best or others will be accepted.

   Lettering shall be Helvetica Medium, typically ⅞" high, all caps. Arrange copy to align on the left margin line, generally centered vertically. Verify that letter size, arrangement, etc., will fit stipulated size and propose appropriate adjustments if needed.

   Sign panels shall be frameless with square or rounded corners, 8" x 8" typical size. Color of panel and contrasting letter faces to be selected from ASI standard color range.

   Sign inserts shall have a rebated edge and be 8" x 8" (or 7" x 7") typical size. Frame shall be of molded plastic with $^{3}/_{16}$" face and rounded or square corners. Inserts, frames and letter faces shall be in contrasting colors as selected from ASI standard color range.

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Signs shall be adhesive mounted 5-foot above the floor on the lock side of the door to be identified. Framed signs shall have a supplemental screw attachment.

Provide the following quantities and types of sign (exact wording to be supplied during construction):

- (5) signs with combination of three-digit room number and provision for card holder
- (1) Janitor
- (1) Toilet w/ H/C Symbol
- (1) Storage

Submit sample for approval together with a color card and a shop drawing showing typical letter style, size and composition.

8. **Traffic Control Type Signs**: Reflective type aluminum, product of Vulcan Signs and Stamping, Inc., Foley, Alabama. Provide for each sign a galvanized 2" square tube (16 gauge minimum) post with square pyramid galvanized cap. Supply types (quantity on drawings) as follows:

   - R7-8 "Reserved Parking" with handicapped parking symbol
   - RT-8 Reserved Parking with handicapped parking symbol and van-accessible sign - R7-8P5

9. **Louvers** (Exterior wall): Equal to Airolite CB6774, 4" deep, all-welded, drainable blade, extruded aluminum louver. Factory prime and finish after assembly with Kynar 500 (PVF2) resin coating in a color selected from louver manufacturer's standard color chart. Provide complete with inside mounted 4 x 4 mesh screen in a removable, rewirable extruded aluminum frame, and adjustable anchors. See schedule for sizes, large scale details for sill condition. One-piece units. Furnish adequate clips for anchoring.

   Louvers must be AMCA certified for water penetration and air pressure drop and shall bear AMCA Label.

10. **Flat Cut Aluminum Address Numbers"** (Exterior wall): Assume four (4) numbers for Bid purposes. Equal to Gemini 10" high, dark bronze anodized finish, arial extra bold. Aluminum shall be minimum of ⅜" flat stock, prepared to mount to metal siding.

11. **Dock Bumpers**: Laminated type equal to Lumm Type XHD, 12" x 24" complete with cadmium plated anchor bolts. Mount vertically as shown on drawings with tops 1" below dock level. Cast mounting bolts into concrete. Equal by Koffler, Durable Mat, Pawling or others will be accepted.

12. **Aluminum Canopy**: E. L. Burns extruded aluminum stock pre-assembled entrance cover of size indicated, in satin anodized finish. Secure to building with galvanized expansion bolts. Counter flash and caulk joint at face of building where first deck rib abuts masonry. Equal by Nu-vent or Dittmer will be accepted.

End of Section

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SECTION 1016

TOILET PARTITIONS

A. METAL TOILET PARTITIONS

1. **General Requirements**: Division One is applicable in full hereto.

2. **Shop Drawings**: Submit for approval.

3. **Manufacturer**: Sanymetal, Weis/Robart or Bradley/Mills.

4. **Fabrication**: Equal to Sanymetal overhead braced type with flush doors and partitions. All steel hot dip galvanized-bounderized with powder coat finish of color selected. Partitions and doors 1" thick, reinforced for hardware. Pilasters shall be 1 ¼" thick and fitted with a stainless-steel base. Headrails shall be extruded anodized aluminum, returned to wall at end compartments.

   - Furnish factory certificate indicating that material is hot dip galvanized
   - Substitute Bradley/Mills "Series 400 Sentinll" will be acceptable

5. **Sizes and Arrangements**: Follow layout and sizes indicated on drawings. If not indicated otherwise,

   Typical stall widths are clear dimensions, which may be adjusted to field measurements. Notify Architect of any condition which would produce less than 36" clear stall widths.

   - Typical stalls shall be 36" x 60" with 24" wide, door swing as shown
   - HC stalls shall be 60" deep x 60" wide with 34" outswing doors arranged to produce a 32" clear opening

   HC stalls shall meet ADA requirements. HC stall widths are given as exact clear widths. Wheelchair accessible compartment doors and hardware shall comply with ADA 404.2.7 and 604.8.1.2. Ambulatory accessible compartment doors and hardware shall comply with ADA 404.2.7 and 604.8.2.2.

6. **Hardware**: Doors to have gravity pivots, pull, stop and latch keeper, bumper and coat hook, and concealed latch with emergency access feature. Partitions shall be supported at wall with "extra strength" "U" brackets (Sanymetal #15792 wall bracket) with two bolts connecting each bracket to partition and/or with screws to wall. All hardware and brackets shall be chrome plated non-ferrous metal or stainless steel (unless otherwise indicated), applied with one-way type screws.

   Grab bars are specified elsewhere

7. **Paper Holders**: Specified in Section Toilet Accessories.

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8. **Erection**: Erect members level, plumb and square, following directions of manufacturer. Securely attach components to one another and to abutting walls, etc. Adjust so that panels and doors have uniform clearance. Neatly cope metal members and file field cut edges. At stud walls attach brackets into wood back-blocking. As a minimum, secure brackets to block walls with #12 x 1½" screws into 1" rawl plugs. Adjust doors to operate smoothly with proper pivot action. Scribe fit headrails to within $1^{1}/_{16}$" of walls.

End of Section

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SECTION 1080

TOILET AND BATH ACCESSORIES

A. TOILET AND SHOWER ACCESSORIES

1. **General Requirements**: Division One is applicable in full hereto.

2. **Submittals**: Submit complete catalog data for each item. Submit a sample of each item for approval; upon acceptance ship to job for rough-in measurements and later installation.

3. **Mounting** (generally): At studs employ screws sized for 1" penetration into wood back blocking; blocking shall be treated pine not smaller than 2 x 6 and secured to studs before rocking or plastering. Cover face of blocking with felt to avoid swelling of lumber by moisture absorption. Align items mounted in battery.

4. **Towel and Soap Dispensers**: Furnished and installed by others.

5. **Fixed Framed Mirrors**: Bradley #700 Series, (18" x 36") plate glass mirror with seamless stainless-steel frame, galvanized steel back plate and concealed mounting. Mount with top 74" above finish floor. Furnish one at each lavatory.

6. **Paper Holders**: At each water closet enclosed by a toilet partition, provide Bradley #5126 double-roll paper holder.

7. **Grab Bars**: Bradley #812-001-42" (Horizontal) (Mark GB-1) and #812-001—18" (Vertical) (at side of WC) and #812-001-36" (Horizontal) (Mark GB-3) (behind WC), 1½" diameter concealed mounted stainless steel grab bars. Bar and mounting method must resist 250# pull. Provide both in each handicapped stall.

8. **Paper Holders**: At each water closet not enclosed by a toilet partition, provide a Bradley #5123 double roll holder with housing of #304 stainless steel in satin finish, with free turning chrome plated plastic rollers. At each water closet enclosed by a toilet partition, provide Bradley #5126 double-roll paper holder.

9. **Paper Towel Dispenser** (Mark PTD): Bradley #244 with 500 C-fold or 800 multi-fold capacity. Unit shall be seamless all-welded construction of 300 series satin-finished stainless steel. Doors shall have full-length piano hinge and tubular lock; all locks shall be KA.

10. **Soap Dispenser**: Bradley #643 recessed (in wall) liquid soap dispenser constructed of 300 series satin finish stainless steel. Tank drawer shall be secured with tumbler lock. All locks shall be KA.

11. **Equal Products** by Bobrick, Gamco, American Dispenser, American Specialties, Columbia Accessories, or others will be accepted.

End of Section

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SECTION 1312

PRE-ENGINEERED METAL BUILDING

A. GENERAL

1. **General Requirements**: Division One is applicable in full hereto.

2. **Scope**: Furnish and erect metal building as shown on drawings and specified herein. Work shall include, but not be limited by, the following:

   - Gutters and downspout (coordinate downspout size 4”x5” with downspout boots)
   - Structural Framing
   - Fascia & soffit
   - Wall Panels
   - Setting bolts and templates (furnish to General Contractor)
   - Metal building wall and roof insulation
   - All other items required for a complete, water-tight metal building structure
   - Roof panels
   - Flashing for all roof penetrations
   - Caulking of Metal Building Components
   - Exterior Ceiling Panels
   - Interior Wall Panels

   The following related items are specified under other Sections:

   - Concrete work
   - Door hardware (including thresholds)
   - Doors, frames and louvers
   - Interior partitions
   - Caulking of items by other trades

3. **Details and Installation**: Modifications and/or different details will be subject to review and approval by the Architect. Note that all manufacturer's "Standard" details do not have blanket approval even though the manufacturer is approved to bid this project. Details that place roof related screws in an exposed position which when the screw leaks it drips into a protected area will not be acceptable even though they may be "standard".

   (NOTE! IF ANY DRAWING OR SPECIFICATION DETAIL IS NOT ACCEPTABLE TO THE MANUFACTURER, NOTIFICATION OF SAME SHALL BE GIVEN TO ARCHITECT AT LEAST 5 DAYS PRIOR TO BID DATE, AND RESOLUTION OF CONFLICT SHALL BE AGREED TO BY BOTH ARCHITECT AND MANUFACTURER [IN WRITING] PRIOR TO BID DATE).

   Subsequent changes shall be at the discretion of the Architect.

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4. **Manufacturer**: American, AEPSPAN, Kirby, Bigbee, Vulcan, Nucor or other approved in writing 10 days prior-to-bid. Approval or listing herein shall not constitute a waiver of specified requirements nor a blanket approval of standard components. Manufacturer must be a member of the Metal Building Manufacturer's Association, or shall have an engineer on its staff, registered in Alabama, and who has been employed by the manufacturer to design structures for at least 5 years. The manufacturer must maintain a certified installer program of its products.

   The manufacturer shall provide an approved and certified representative to inspect the work. The manufacturer's representative will provide a certificate of compliance in a start up, in progress and final inspection mode, certifying that the building and roof system will be approved to receive the manufacturer's guarantee. Submit written reports of inspection to Owner and Architect. Inspections are to be conducted in the presence of the Architect.

5. **Installers Qualifications**:

   a. Installation of the metal building and metal roofing installers and roof related accessories shall be performed by installers (Section 0765) APPROVED & CERTIFIED by the manufacturer as trained and qualified to erect the manufacturer's product.

   b. Roofing contractor must have 5 years' experience installing similar systems and must submit a letter from the manufacturer of the standing seam metal roofing system, certifying their approval and training by the manufacturer to install the system proposed.

   c. Erectors field superintendent shall meet these same requirements.

6. **Submittals**: Furnish complete erection drawings showing anchor bolt setting, transverse cross-section, sidewall, end wall, roof framing, sheeting, flashing details, and all accessory details. Submit catalog data on accessories. Provide actual color samples of metal for color selection. During submittal stage, Metal Building Manufacturer shall submit approved list of anchors and clips, as well as indicating approved locations in beams and purlins, for use by plumbing, sprinkler, mechanical, and electrical contractors. Submittals shall be prepared by manufacturer providing warrantees. Anchors shall be used to support piping, ductwork, mechanical equipment, conduit, etc.

   Furnish design analysis. Drawings and design analysis shall bear the seal of a professional engineer registered in the State of Alabama.

   Mock Ups: Assemble mock-up samples of roof ridge, rake, window, door and louver head, jamb and sill flashing assemblies for on the site review and approval. Retain samples throughout job.

7. **Pre-Work Conference**: A representative of the metal building and roofing erector shall attend the conference with the Contractor, and the Architect. Refer to Section 0104.

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8. **Design**: Design live load criteria shall be not less than that allowed by IBC; wind loading per pressures as set forth in IBC. See structural drawings for notes regarding Pre-engineered Metal Building design. Members serving to brace or support walls, partitioning, etc. shall be designed to accept the loads transferred to them by other building components. Note specifically exterior and interior walls.

   Meet all applicable code requirements in effect at the locality.

   The design, configuration and arrangement of structural shapes shall allow concealment within the wall and ceiling spaces, etc. as detailed, so as to produce the finish and usability as intended. Locate lateral bracing so as not to interfere with doors, windows, or other design elements of the building. If building design loads differ from those noted on structural drawings, metal building manufacturer shall be responsible for redesign of foundations and shall submit such changes to the Architect for approval.

9. **Roof Guarantees**: The manufacturer shall warrant for 20 years from the date acceptance of the project that the entire system (roofing trim, curbs, boots, flashing, etc.) shall be free from defective materials and workmanship and that the entire roof system shall be weathertight for the 20-year period. Repairs to the roofing system that become necessary because of defective workmanship and/or materials while roofing is under warranty/guarantee shall be performed within 21 days after notification, at no cost to the Owner. Guarantee may be limited to repair or replacement of the roof system failures caused by ordinary wear under normal atmospheric conditions or defective materials or workmanship. Guarantee shall be limited to the specific dollar amount paid by the General Contractor to the Roofing Subcontractor for the roof system. (NOTE! IF MANUFACTURER CANNOT FURNISH WARRANTY MEETING THESE REQUIREMENTS, DO NOT BID.)

   Standard manufacturers' 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.

10. **Finish Warranty**:

    a. Durability of the metallic coated and unpainted panels due to rupture, structural failure or perforation shall be warranted for a period of twenty (20) years by the manufacturer.

    b. The exterior color finish for painted panels and trim shall be warranted by the Manufacturer for thirty-five (35) years against blistering, peeling, cracking, flaking, chalking and chipping. Excessive color change and chalking shall be warranted for thirty-five (35) years. Color change shall not exceed 5 NBS units per ASTM D2244.68T, chalking shall not be less than a rating of 6 (white) or 8 (other colors) per ASTM D-659.

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11. **Building Weather Tightness Warranty**: In addition to the Roof Warranties above, warrant for 5 years the building envelope, including wall panels, fascia, soffit and other products of the metal building manufacturer to be weather tight. Any leaks which occur shall be corrected and the warranty on the problem area shall begin anew and run for 5 years from the time of the leak. Repairs to the building system that become necessary because of defective workmanship and/or materials while building system is under warranty/guarantee shall be performed within 21 days after notification, at no cost to the Owner. Guarantee may be limited to repair or replacement of the building system failures caused by ordinary wear under normal atmospheric conditions or defective materials or workmanship. Guarantee shall be limited to the specific dollar amount paid by the General Contractor to the Building System Subcontractor.

    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.

B. MATERIALS

1. **Structural Members**: Steel for hot rolled structural sections shall conform to ASTM A-36 and shall have a minimum yield point of 50,000 psi. Steel for purlins, girts, and other secondary framing members shall have a minimum yield point of 55,000 psi. All structural steel shall be designed and fabricated in accordance with applicable AISC Specifications. After fabrication members shall be clean free of mill scale and other foreign matter and given one coat of brown oxide primer.

2. **Roof & Wall Panels, Trim, Etc.**: Panels shall have a standard factory color finish on the exposed side. The exposed finish shall consist of a 70% KYNAR 500 resin base coating applied to a cleaned, pretreated and primed surface (galvalume coated steel in either 24 or 26 gauge as specified). Color, to be selected from manufacturer's standards/Premium/Custom colors. The dry film thickness of the exterior coating shall not be less than 0.8 mil. exclusive of the primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. Panel and trim colors to to be selected from manufacturer standard offerings.

    a. Vertical Wall Panels: The Southeast wall shall be equal to AMS Flat "12" Panel (flush), wall panel with concealed fasteners. All other walls shall be equal to AMS Long Span III (or R-Panel). Panels to be 24 ga steel, galvalume, panels to be attached to framing members by self drilling carbon steel screws #12 hex washer head. Match width of existing adjoining building.

    b. Standing-Seam Roof Panel Kynar Finished (Galvalume): Standing seam roof panel shall have a configuration consisting of 2" high vertical rib spaced on 16-inch centers (AMS Loc-Seam 360). The panel shall have flush horizontal and vertical surfaces to facilitate sealing at terminations. Panel configurations which create voids requiring supple metal closure devices shall not be considered acceptable. Panels shall be joined at the side lap with an interlocking seam mechanically locked by a seaming machine after installation. The female panel seam shall have a factory applied sealant. Panels shall be full length ridge to cove, no end laps permitted.

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The roof panel shall be 24 gauge (minimum) commercially pure aluminum coated steel meeting military specification MIL-C-4174A type II or G90 galvanized steel, Type AZ-55 Grade 50B, smooth per ASTM A792-96. Minimum yield stress shall be 50,000 PSI.

3. **Wall and Roof Insulation**: System shall be installed per details as approved by the Architect and the manufacturer.

   Roof Insulation Fabric Liner System:
   Provide roof insulation " Fabric Liner System" equal to Guardian's (Silvercote) Energy Saver FP System". Provide two layers of fiberglass insulation with top layer of R-10 value and bottom layer of R-21 value, total value of R-31. Include all banding, fabric liner, insulation, thermal blocks, fasteners, etc. for a complete installed systems. Fabric liner for system to be equal to LamTec "WMP-10". Banding color to be white. All edges and laps to be on bearing and sealed or taped. Tape to match facing. Installation to be in accordance with manufacturer's instructions.

   Roof Insulation Banding System:
   Provide roof insulation system equal to Guardian's (Silvercote) "Banding System". Provide two layers of fiberglass insulation (2 layer system), top layer with R-10 value and bottom with R-21 value, total R-value of 31. Provide system with all banding, insulation, fabric liner, thermal block, clips, fasteners, etc. for a complete installed system. Fabric liner for Banding System to be LamTec WMP-10. Banding color to be white. All edges and laps to be on bearing and sealed or taped. Tape to match facing. Installation to be in accordance with manufacturer's instructions.

   All laps to occur over purlins and are to be taped and sealed in place with double face tape.

   Rigid Wall Insulation System (Do Not provide on North-East [or North Plan View] wall - this rated wall receives full length x full height Fire Wall): Extruded polystyrene equal to Dow Styrofoam Cavitymate SC or UCI Foamular, meeting ASTM C-578, Type IV with R-value 5 at 75-degree F per inch. Supply square edge in 48" widths x 96" x 2¼" thickness full standard size lengths. Store under cover and above ground; avoid exposure to sunlight.

   Coordinate with fire wall provider for timely erection (including insulation) prior to running siding and roof edge trim. Provide screws for siding and trim that will penetrate fire wall and anchor into girts or other horizonal PEB framing.

   Provide layer of condensate insulation (with LamTec "WMP-10" fabric liner) to inside face of rigid insulation.

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C. ERECTION

1. **General**: Erection shall be in accordance with MBMA "Code of Standard Practices" and approved shop drawings.

2. **Structural Framing**: Anchor bolts shall be set per templates by General Contractor. Provide uniform bearing under base plates and sill members using non-shrinking grout, see specification Section 0500-A9.

   Members shall be accurately spaced to assure proper fitting of panels. As erection progresses, the work shall be securely fastened to resist deadloads and wind and erection stresses.

   Provide additional framing as required for miscellaneous roof supported equipment.

3. **Panels and Trim**: Discard stained, discolored or damaged members. Apply wall panels with the longitudinal configuration in the vertical position. Provide a bearing surface for all members at or near ends, around corners, doors, windows, etc. so the material can be pulled to true plane. Spacing of fastenings shall present an orderly appearance and shall not exceed 12" oc. Side laps of panels and joints in accessories shall be sealed, and all fasteners shall be driven through gaskets. All trim shall be fastened to support members. Installation shall produce a watertight structure.

4. **Doors, Frames, Windows and Louvers**: Securely anchor to the supporting construction, install plumb and true, and adjust as necessary to provide proper operation and weathertight condition.

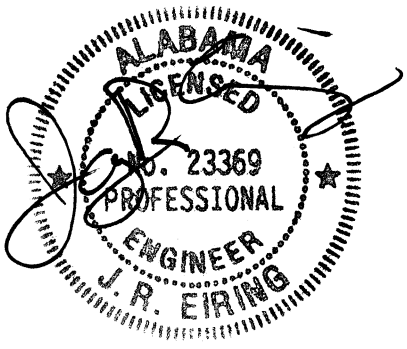
5. **Field Painting**: Immediately upon detection, abraded or corroded spots on shop-primed surfaces shall be wire brushed and touched-up with the same material used for the shop coat. Touch up of factory color finished surfaces is not allowed. Replace damaged factory finished metal.

End of Section

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These specifications sections were prepared by and under the direct supervision of the Engineer of Record for this project.

Division 15 – MECHANICAL
15010 Mechanical General Provisions
15400 Plumbing
15700 Heating, Ventilating & Air Conditioning



August 24, 2026

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SECTION 15010

GENERAL MECHANICAL PROVISIONS

PART 1. GENERAL

1.1. **General Requirements:** Carefully and completely read all the specifications, review all plans and all related construction documents. Pay particular attention to strict submittal requirements and note the ramifications of providing incomplete or incorrectly formatted and incorrectly submitted submittals.

The respective Contractor is responsible for paying all fees, utility connections, permits, etc., required. No consideration will be given after bid opening for alleged misunderstanding regarding the specifications, plans, utility connections, permits, fees, etc.

Division One is applicable in full hereto. Where the words, "provide", "furnish", "include" or "install" are used in the specifications, Codes or on the Drawings, it must mean to furnish, install, and test, complete and ready for operation as specified and required.

No materials or products that contain asbestos, formaldehyde, polychlorinated biphenyl (PCB), lead or mercury, in excess of limits mandated and defined by OSHA, LEED and the EPA, must be utilized.

Manufacturers not mentioned in the specifications require prior approval, seven (7) days prior to bid date. Follow procedures set forth in Division 1 of the specifications. All prior approvals must be submitted through the Architect. Where substitutions are proposed, unless the Contractor states in writing, on a separate recap/summary sheet in front of the respective submittal, the differences of the substituted equipment or material, he must be responsible to replace such items any time discrepancies are found.

Where conflicts occur between a Code, Standard or Listing and the contract drawings or contract specifications, the most stringent requirements must govern and be applied.

The Architect and Engineer must interpret the meaning of the drawings and specifications and will reject all work and materials, which in their judgment, is not in full accordance therewith.

1.2. **Spare Parts:** Manufacturer of any equipment specified must have a wholesale outlet for readily available replacement parts in the nearest major USA city.

1.3. **Codes and Standards and Listings:** Unless specified otherwise, comply with all current editions of all referenced publications within these specifications and all current editions of applicable NFPA, ASME, OSHA, IBC, ASHRAE, ASTM, ASME, ANSI, SMACNA, Americans with Disabilities Act (ADA), ADA Standards for Accessible Design, with Local Building Codes, Mechanical Codes, Gas Codes, Plumbing Codes, ANSI/ASHRAE/IESNA Standard 90.1, ANSI/ASHRAE Standard 135, International Energy Conservation Code (IECC), International Fuel Gas Code (IFGC), International Fire Code (IFC), Americans with Disability Act Accessibility

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Guidelines (ADA), ICC A117.1 Standard for Accessible and Usable Buildings and Facilities, U.S. Department of Energy Regulatory requirements and with all applicable local ordinances and codes. Equipment must bear Underwriters Laboratories Inc. (UL) listing label, Canadian Standards Association (CSA) listing label or ETL approved rating. All electrical components and products must also comply with the respective Code of Federal Regulations (CFR).

Where conflicts occur between a Code, Standard or Listing and the contract drawings or contract specifications, the most stringent requirements must govern and be applied. Advisory provisions listed in all Codes referenced in the Contract Documents are mandatory and the word “should” must be interpreted as “must”.

1.4. **Permits and Inspections:** Provide all permits, pay all fees and arrange for inspections as required by all applicable Governing Authorities. Furnish certificates of all inspections and approvals from all Governing Authorities to the Architect. Include certificates of all inspections and approvals from all Governing Authorities in the Plumbing and HVAC closeout documents. Provide additional materials, parts, methods, etc. and modify the work as required by Governing Authorities’ Inspections and Regulations. Correct all deficiencies required by Code officials at no additional cost to the Owner or the Owner’s Project Design Professionals.

The Plumbing Contractor must arrange and pay for the State of Alabama Boiler and Pressure Vessel Safety Division/Inspection Divisions, Elevators/Boilers Inspector to visit job site to inspect water heater and/or boiler installation and obtain written approval, certification and Certificate for Potable Water Heater (PWH) as required. **This inspection must be accomplished prior to the final site visit; to include the tagging of the equipment with the inspection tag, else DCM will cancel the site visit and impose a reinspection fee.**

Correct all deficiencies required by any Governmental Inspector without additional cost to the Owner or the Owner’s Project Design Professionals, using materials and methods, as directed by, State of Alabama Boiler and Pressure Vessel Safety Division/Inspection Divisions and Elevators/Boilers inspector as required.

1.5. **Site Visits:** It is the contractor’s responsibility to have the job ready for site visits when they are scheduled. If the project is not ready for the requested site visit and the Architect, any governmental agency or any other entity requires a re-inspection with the Engineer present, the contractor must pay Zgouvas, Eiring & Associates a re-inspection fee of $2,000. The payment must be made directly to Zgouvas, Eiring & Associates 5 days prior to the scheduled re-inspection.

The Contractor is urged to carefully review the extensive requirements of Paragraph “Identification” in this Section 15010 of the specifications and note that certain identification is required to be completed before certain site visits. There are specific identification requirements prior to the above ceiling and final site visits, respectively, that are mandatory. The State of Alabama Department of Construction Management (DCM) will cancel on-site, the site visit if not completed as specified. Failure to comply with this provision will be cause for cancellation of the site visit, and a fee imposed for the additional site visit, with all costs of the additional site visit to be borne by the Contractor.

1.6. **Drawings and Specifications:** The Architect and Engineer must interpret the meaning of the drawings and specifications and will reject all work and materials, which in their judgment, is not in full accordance therewith. Where doubt arises as to the meaning of the plans and specifications, obtain the Architect's decision, in writing,

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before proceeding with parts affected; otherwise assume liability for damage to other work and for making necessary corrections to work in question.

All drawings are diagrammatic and are intended to quantify the materials specified and indicate their intended relationship with each other. The drawings and specifications are complementary, and work shown, but not specified, or specified, but not shown, must be the same as though required by both.

Bidders must carefully examine the contract documents during the bidding phase. Any missing information, clarifications, conflicts, etc. in the contract documents that is required to provide accurate pricing must be brought to the attention of the Architect, **prior to bid date**, so all may be clarified and/or corrected. Failure to identify and resolve any issue prior to bid must require the Contractor to provide said items, complete, without additional cost to the Owner or the Owner's Project Design Professionals, using materials and methods specified by, and as directed by, the Owner's Design Professionals.

Bidders must visit the site and become acquainted with all job conditions that may affect the work shown on the plans. Report to the Architect, prior to bid, any new or existing conditions that require modifications to accomplish the installation of all items. Provide for required adjustments to complete the intent of the work. No consideration will be given after bid opening for alleged misunderstanding regarding new or existing job conditions, utility connections, permits, fees, construction documents, etc.

DO NOT SCALE the Plumbing and HVAC drawings. In the interest of clearness, the work is not always shown to scale or exact location. Refer to Architectural drawings for dimensions and verify scale shown on the drawings. The various scales used on the drawings do not allow for all fittings, offsets and accessories that may be required to complete the work. Check all measurements, location of pipe, all required and specified appurtenances for duct and piping, ducts, and equipment with the architectural and electrical drawings, and lay out work to fit in with ceiling grids, lighting, and other parts. All wiring, piping, ductwork, etc., must be concealed unless specified or noted otherwise. Adjust in the field as required to provide the optimum result to facilitate ease of service, efficient operation, and best appearance.

1.7. **Conflicts, Coordination and Changes:** If interferences or conflicts occur, the Architect must decide which equipment must be relocated regardless of which was first installed. In the interest of avoiding such conflicts, each Sub-Contractor who is using common space, etc., must coordinate his work with all other trades and other parts of his own work. If during this coordination, it is discovered that necessary or desirable changes are required to be made, advise the Architect and secure his decision in writing prior to proceeding. Do not fabricate or install any items, equipment, etc. until all coordination has been accomplished.

Coordinate the location of all Division 15 work with Division 16. Do not run piping, ductwork and similar Division 15 work in NEC dedicated service areas for electrical equipment, including above panel boards, starters, communication panels, control panels, telephone backboards, data panels and similar electrical elements.

1.8. **Coordination Drawings:** Follow procedures set forth in Division 1. Before starting work, submit for review, coordination shop drawings showing proposed arrangement of all equipment, all piping, ducts, floor drains, power requirements, all equipment maintenance requirements and controls. As a minimum, submit detailed layouts of potential conflicts at plumbing risers, equipment rooms, limited ceiling space, etc.

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Refer to subsequent Sections for additional specific requirements.

Coordinate the submission of shop drawings and refer questionable locations to Architect/Engineer for resolution prior to installation. Failure to coordinate all items, and correct non-conforming installed work, must be provided at no additional cost to the Owner or the Owner's Project Design Professionals.

Failure to submit shop drawings must make the Contractor responsible for changes required to facilitate installation of, and the proper operation of, all systems at no additional cost to the Owner or the Owner's Project Design Professionals.

1.9. **Maintenance, Replacement and Service Access:** Locate equipment as shown on the plans. The Contractor must install valves, controllers, actuators, manual dampers, motorized dampers, air vents, cleanouts, smoke detectors, fire dampers, smoke dampers, fans and any other items requiring maintenance access with the maintenance, service and replacement access required by the Manufacturer of the respective installed item. All items must be installed to provide maximum safety, service, replacement, and maintenance access.

To ensure proper maintenance access, all piping with valves, any equipment, and any other items that may require maintenance, service or replacement, must be located no more than 12" above the finished ceiling and no more than 14'-0" above finish floor in areas without ceilings.

Coordinate all questionable access or location of items that may present a problem, if installed as specified above, with the Engineer or the Architect's field representative prior to installing any item; else, relocation will be at the Contractor's expense once discovered.

1.10. **Warranty:** Refer to Division 1. Additionally, guarantee in writing to make good without cost any defects in materials and workmanship for one year following the date of substantial completion of the project as determined by the Architect. Provide free maintenance and service during the guarantee period.

Refer to other Division 15 Sections for additional detailed warranty requirements.

1.11. **Submittal Data:** Within 25 days of contract award, all contractors must submit a complete submittal for review of **all** specified items proposed including a detailed schedule of materials, means and methods, equipment, etc.. Failure to submit any specified items will result in rejection of non-compliant materials, equipment, means and methods, etc. when discovered, with replacement costs borne solely by the contractor. The Architect and/or Engineer's review of submittals does not absolve the contractor of full responsibility for strict compliance with all contract documents.

Variations from the specifications, plans and all value engineered (VE) items for the items submitted for review must be explicitly indicated immediately after the submittal cover page otherwise, it will be assumed the product will conform to the plans and specifications in all respects.

Where substitutions are proposed, unless the Contractor states in writing, on a separate recap/summary sheet in front of the respective submittal, the differences of the substituted equipment or material, he must be responsible to replace such items any time discrepancies are found.

Submittals must include catalog data, scheduled capacities, fan curves, sound data,

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materials and methods of installation, various components of various assemblies, etc.

The General Contractor must review and stamp all submittals prior to submitting them to the Architect. Submittals provided without the General Contractor's review will be automatically rejected and a possible re-review fee of $700 imposed.

Only ONE complete submittal will be accepted for each specification section. Do not submit plumbing fixtures separately without the remaining Section 15400 items submittal. If a partial or incomplete submittal is provided, it will be automatically rejected and a possible re-review fee of $700 imposed. If the Contractor provides a submittal for review and then provides additional items for review after the initial submittal was submitted, a $700 review fee will be imposed. The objective is to provide one complete submittal as specified hereinbefore. **Providing submittals piecemeal is not allowed.**

All submittals must be separately bound by specification Section (Plumbing, Fire Protection and HVAC) in pdf format. Submittals must be electronically indexed and tabbed. Refer to the Architectural General Conditions and Division 1 for the format required by the Architect.

A cover sheet must be provided in front of the submittal package which states, as a minimum, the Project name and location, the name of the Owner, the Architectural firm, the Engineering firm, **the Engineer's Project number, NOT THE ARCHITECT'S PROJECT NUMBER,** located within the Engineer's logo in the bottom right corner of the HVAC, Fire Protection and Plumbing plans, the General Contractor, the Mechanical Contractor, Fire Protection Contractor and Plumbing Contractor and each Contractors' point of contact, with phone number, as applicable for the respective trade's submittal. The respective Contractor's contact phone number is requested in an effort to obtain submittal clarifications which otherwise may be cause for rejection by the Engineer.

A recap/summary sheet must be inserted at the beginning of each tabbed section to summarize the contents of each respective tabbed section. The recap/summary sheet must include all items that have been changed or removed due to Project cost constraints, addendums, or Value Engineering (VE).

Failure to include items changed or removed due to Project cost constraints, addendums or VE items that require an additional review by the Engineer will require the Contractor to reimburse the Engineer a minimum of $700 for the effort involved to review the corrected submittal.

Submittals must include specifications section numbers and related sub-paragraph numbers, materials used, methods of installation, product manufacturer, equipment capacities, etc. HVAC equipment items must follow the identical tabular format, category by category, nomenclature, etc., as shown on the HVAC equipment schedules. As a minimum, the recap/summary sheet must indicate the submitted values compared to each of the specified values. **Failure to provide the submittals in the format specified will be cause for immediate rejection without review.** If there is any doubt as to the format required for the HVAC equipment summary sheet, contact ZEA and an example will be provided. Plumbing and Fire Protection submittals must follow the identical procedure specified for the Mechanical Contractor.

1.12. **Submittal Rejection and Resubmittal:** The Contractor must carefully review the

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submittal data requirements specified above. Pay particular attention to specific items within the specifications that are cause for immediate rejection when submittals are not provided to the Engineer as requested or specified. Any submittal that requires a review before the Engineer receives a complete submittal or portions thereof that are rejected TWICE and resubmitted a third, fourth, etc. time for review will require the Contractor to reimburse the Engineer each time for his effort. The minimum fee for each re- review is $700.

When submittals are rejected, **DO NOT** return a copy of the rejected submittal with the Engineer's review stamp or notations. Provide a clean submittal addressing all requested, outstanding and rejected items. Provide a recap sheet that also addresses each comment made by the Engineer.

1.13. **Site and Existing Conditions:** Bidders must visit the site and become acquainted with all job conditions that may affect the work shown on the plans. Report to the Architect, prior to bid, any new or existing conditions that require modifications to accomplish the installation of all items. Provide for required adjustments to complete the intent of the work. No consideration will be given after bid opening for the alleged misunderstanding regarding new or existing job conditions, utility connections, permits, fees, etc.

1.14. **Line Locators:** Before proceeding with excavating or trenching, arrange with the Owner, all utility companies, and line locating firm(s) to describe, mark and locate utilities, piping, conduits, etc. which might be damaged by construction operations. Failure to provide the above must make the offending Contractor responsible for all costs involved to correct the damage incurred.

1.15. **Phasing:** Interrupt existing services only at times approved by the Architect and the Owner. The General Contractor must make a written request to the Architect and the Owner for permission to interrupt services at the facility. The request must be provided with a minimum of seven (7) days prior to the desired date of the interruption. Hold interruptions to a minimum in duration and frequency.

1.16. **Contractor Requested Electronic Drawing Files:** Not available.

1.17. **Record Documents:** Provide in such detail, as is set forth under General and Supplemental Conditions.

Keep an accurate record of changes made during construction. The respective Contractor must take as-built measurements, including all depths, prior to commencement of backfilling operations. It will not be sufficient to check off line locations. Definite measurements must be taken for each service line. The location of buried piping must be shown on the drawings and dimensioned from fixed points.

The respective Contractor must complete the Record Documents, using the As-Built Drawings from the General Contractor's construction site office. Transfer these changes to a set of reproducible copies of original drawings that the Architect will sell to Contractor at printing cost. The drawings will be provided to the Contractor "As Is".

The final drawing set within the Record Documents must be labeled "***Record Documents***" in the Title Block and must not include "clouds" or other indications of the changes during the project process. The Contractor must provide hard copies and an electronic set of all documented modifications to the contract documents.

The Contractor is responsible for providing and showing all changes to the drawings

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that are different from the original contract drawings, including but not limited to addendums, change-orders, VE items, RFI's, test reports, field observations/site visit reports, etc. Hard copy plans may be a set of reproducible copies of the final corrected contract drawings. When work is completed, submit corrected reproducible drawings to the Architect for record and include copies in the Owner's Operating and Maintenance Manual.

Record documents must also be provided in PDF digital format on CD-R type CD(s). Include a CD of the documents in the Owner's Operating and Maintenance Manual.

PART 2. MISCELLANEOUS REQUIREMENTS TO BE COORDINATED WITH OTHER TRADES

2.1. **Foundations and Supports:** The Plumbing, Fire Protection and Mechanical Contractor, as applicable, must provide foundations, support, etc. not specified under other Divisions, and as required to mount all items in a safe, professional and structurally sound manner. The respective Contractor must provide all supplemental steel between various types of structural members, including between bar joists, purloins, wood trusses, miscellaneous structural items, etc. as required for the item(s) proper support. All supports and related components and assemblies must be sized for a minimum of 300% (3 times) the anticipated load carried by the respective item.

Where the Contractor has doubt as to proper supporting requirements, he must consult with, and seek the guidance of, the Architect and the project Structural Engineer for resolution. Consult all contract documents pertaining to other trades to determine extent of their work.

Concrete pads for outside equipment are specified under other Sections. Concrete work must meet the requirements of Division 3. Respective Contractor must provide all concrete pads not indicated or specified on the Architectural, Civil or Structural plans. Refer to the various equipment specifications for requirements in the absence of requirements by the various disciplines and provide as specified.

2.2. **Pipe Sleeves:** Sleeves are required for all interior partitions, floors, perimeter exterior walls, etc. regardless of whether the above ceiling penetration occurs at locations where partitions go to the structure above or stop short of the structure above. All pipe sleeves must be installed as work progresses. Split sleeves are not allowed. See plan details for additional requirements.

All penetrations of existing construction and all new construction that were not built-in must be core drilled or sawcut large enough to allow all conduits, piping, wiring, sleeves, etc., to continue uninterrupted, and as required to install new items as shown and specified. See plan details for additional requirements. **Note that ALL penetrations of partitions that go to the deck/structure above require a firestopping/sleeve assembly, regardless of whether partition is rated or not.**

Where non-rated walls or partitions do not extend to the structure above, a firestopping assembly or device is not required at the penetration. Instead, provide a 10 ga. galvanized sleeve of size required and specified. Pack the opening on both sides of the partition/sleeve with mineral wool insulation and seal on both sides with materials the same as the material penetrated. i.e., If it is a penetration of gypsum board, seal with gypsum board joint compound. If it is a penetration of concrete block, seal with cementitious type product. Provide escutcheon on both sides of the partition in spaces exposed to view. See plan details for additional requirements.

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Do not route any wiring through sleeves/firestop assembly in partitions containing piping. Do not route multiple items through a single sleeve/firestop assembly. Provide a grommet at the conduit termination point to avoid control wiring abrasion at the conduit termination point.

Each pipe and conduit must have its dedicated sleeve/firestopping assembly.

All floor sleeves, except slab on grade, must be cast-in-place Schedule 40 steel pipe. Floor sleeves in foundations above the finish floor must terminate 2” above finish floor or housekeeping pad as applicable, and flush on the bottom side of the concrete foundation.

Any pipe that passes through a below grade foundation wall must be provided with a relieving arch, or a pipe sleeve pipe cast in place into the foundation wall. The sleeve must be two pipe sizes greater than the pipe passing through the wall. Example: A 6” uninsulated pipe must require an 8” sleeve.

Piping installed through a foundation wall must be structurally protected from any transferred loading from the foundation wall. The annular space between pipe and sleeve must be filled with backing material and sealants in the joint between the pipe and concrete or masonry wall. Sealant selected for the earth side of the wall must be compatible with damp proofing/waterproofing materials that are specified in Architectural section of the specifications to be applied over the joint sealant.

Demolish and modify existing roof, walls, floors, partitions and ceilings as required to accomplish the required work. Remove existing carriers, valves, hangers, supports, existing water and waste piping, saw cut floors, walls, partitions, ceilings, etc., as shown and as required to install new piping or reconnecting to existing waste and water rough-in. Do not reuse any existing hangers, supports, valves, etc. All items must be new.

Reconstruction and repair of the demolished/modified items must be as directed by the Architect. Coordinate demolition and repairing/rebuilding of items with General Contractor prior to bid to allow for installation of carriers, piping, etc., as applicable.

2.3. **Firestopping:** Provide assemblies to form a specific U.L. or ASTM tested and listed system with minimum 10 ga. sleeve and appropriate UL/ASTM listing that maintains the required or specified integrity of the fire barrier and non-fire barrier to stop the passage of fire, gases, smoke and water. The through-penetration firestop systems and firestop devices must be tested and listed in accordance with ASTM E814 or UL 1479 using the "F" or "T" rating to maintain the same rating and integrity as the fire barrier being sealed or a minimum of 1-hour protection for non-rated assemblies. The assembly or device must prevent passage of fire, smoke, gases and water through openings, and prevent transmission of sound and vibration from the penetrating element to the structure. Penetrations involving insulated piping must be a tested and listed firestop system not requiring removal of insulation and in accordance with ASTM E 814 or UL 1479.

Wherever pipes, conduit, ducts, etc. penetrate any type of interior construction that extends to the underside of the structure/deck above it, **regardless of whether the wall, partition or floor is a rated assembly or not,** the space between the penetrating member and the building construction must be sealed with an ASTM E814 or UL 1479 listed, approved and labeled factory fabricated firestop assembly or device as specified above.

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Where partitions are not indicated as fire rated, the firestopping assembly used must provide a minimum of one-hour resistance.

Where walls or partitions do not extend to the structure above, a factory fabricated firestopping assembly is not required. Instead, provide a 16 ga. galvanized sleeve or conduit (for wiring) and pack the respective sleeve or conduit as specified above in Para. Sleeves.

At each through penetration, attach identification labels on both sides, in location where label will be visible to anyone seeking to remove penetrating items or firestopping. Attach labels permanently to surfaces adjacent to and within 6 inches of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Provide metal labels in areas used as return air plenums. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Additionally, secure to the wall with metal thumbtack at each corner of the label. Labels must be Hilti Firestop Identification Labels 00339611, 3M Sticker 98040056289 or approved equivalent. Firestop identification labels must include the following information on labels:

1. The words: "*Warning--Through-Penetration Firestop System--Do Not Disturb. Notify Building Management of Any Damage*."
2. Contractor's name, address, and phone number.
3. Through-penetration firestop system designation of applicable testing and inspecting agency.
4. Date of installation.
5. Through-penetration firestop system manufacturer's name.
6. Installer's name.

All fire stop material employed on the project must be the same brand throughout. The firestopping assemblies must be manufactured by Hilti, 3M, USG or other pre-approved Manufacturer.

2.4. **Access Panels and Doors:** Do not locate serviceable items above inaccessible, hard ceilings without written approval from the Architect. Coordinate all items' locations with the Architectural ceiling plans before installing any items. Furnish access panels and doors required to the General Contractor for installation for access to valves, controllers, actuators, manual dampers, motorized dampers, air vents, cleanouts, smoke detectors, fire dampers, smoke dampers, fans and any other items requiring maintenance access. Refer to Section 15700, Paragraph Access Doors and Panels for access in ductwork.

Doors/panels must be suitable for location and finish involved, 16" x 16" unless otherwise indicated, required or specified to permit removal of equipment and provide acceptable maintenance access.

Access panels and doors must be fire rated where rated assemblies are penetrated. Access panels and doors for items located outdoors or in damp environments must be weatherproof.

Access panels and doors must be manufactured by Milcor, Philip Carey, Zurn, Mifab or approved equivalent. The Architect must approve the use of, and type of, panels and doors to be installed in areas that are exposed to view or in finished areas.

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Exposed access panels and doors must be factory cleaned and primed for painting in the field. Colors, materials and methods must be selected by the Architect. Refer to Architectural Section, Painting, for additional information.

Where device occurs above a lift-out acoustical ceiling panel, provide engraved plastic labels of type specified in “Miscellaneous Requirements, Identification” below.

In addition to identification of items above the ceiling, provide engraved plastic labels below the item, on the ceiling grid. Engraved plastic labels must match ceiling grid color and be neatly glued to the ceiling grid adjacent to the ceiling tile that should be removed for access to the item. The label must have engraved on it the item being identified and its designation as shown on the plans, valve chart, etc. Refer to Section “Identification” below for additional requirements.

2.5. **Cutting and Patching:** All openings must be laid out. Furnish detailed layout shop drawings to other trades in advance of their work. Failure to furnish layout shop drawings to the General Contractor must make the applicable Mechanical/Plumbing/Fire Protection Contractor responsible to rebuild openings as directed by the Architect. Where openings have not been laid out or built in, or they occur in existing partitions, floors, etc., they must be core drilled or saw cut large enough to allow all penetrating items with or without insulation to continue uninterrupted, with clearances specified.

Piping and duct within walls or behind walls must be installed before wall is erected otherwise, walls, floors, ceilings, etc., affected must be reworked by the trade which erected it at expense of the respective Contractor. Chasing and cutting new work is not allowed without written permission from the Architect.

2.6. **Duct and Miscellaneous Items Painting and Finishes:** Painting of ducts, piping, piping insulation, grilles, diffusers, and other surfaces in finished areas is specified in Architectural Section "Painting" or similar section. Refer to those sections for requirements. If not specified in other sections, paint items with two coats of paint as directed by the Architect. Where the Architectural specifications require items to be painted, the Contractor must furnish it with a Manufacturer provided, factory applied prime coat.

Where factory finished items are marred, scratched, or damaged, replace the item, or upon approval from the Architect or Owner, refinish or touch-up as required or specified to bring to a like new condition.

All paint and coatings must have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. Also, see the Specification Section, "Identification", for additional requirements.

PART 3. EXCAVATION, TRENCHING & BACKFILLING

3.1. **Excavation:** Keep excavation free from water by pumping if necessary. Ensure that walls and footings and adjacent loadbearing soils are not disturbed in any way, except where lines must cross under a footing. Where a line must pass under a footing, make crossing with the smallest possible trench to accommodate the pipe. Where a line must pass adjacent to and below the bottom of a column footing, or the corner of a continuous footing, backfill the trench with concrete up to the level of the footing bottom, for a distance away from the footing equal to the depth of the fill.

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3.2. **Over-Excavation:** Where trenches are excavated below the installation level of the pipe such that the bottom of the trench does not form the bed for the pipe, the trench must be backfilled to the installation level of the bottom of the pipe with sand or fine gravel placed in layers not greater than 6 inches in depth. The backfill must be compacted after each placement.

3.3. **Trenching and Bedding of Piping:** Buried piping must be supported throughout its entire length. Where trenches are excavated, such that the bottom of the trench forms the bed for the pipe, solid and continuous load-bearing support must be provided between joints. Bell holes, hub holes and coupling holes must be provided at points where the pipe is joined. Such pipe must not be supported on blocks to grade. In instances where the material manufacturer's installation instructions are more restrictive than those prescribed by the IPC, the material must be installed in accordance with the more restrictive requirement.

3.4. **Backfilling:** Backfill within the building and under paved areas must meet compaction requirements established under Division 2.

Backfill must be free from discarded construction material and debris. Loose earth free from rocks, broken concrete and frozen chunks must be placed in the trench in 6-inch layers and tamped in place until the crown of the pipe is covered by 12 inches of tamped earth. The backfill under and beside the pipe must be compacted for pipe support. Backfill must be brought up evenly on both sides of the pipe so that the pipe remains aligned. In instances where the manufacturer's instructions for materials are more restrictive than those prescribed by the IPC, the material must be installed in accordance with the more restrictive requirement.

3.5. **Protection of Footings:** Trenching installed parallel to footings and walls must not extend into the bearing plane of a footing or wall. The upper boundary of the bearing plane is a line that extends downward, at an angle of 45 degrees from the horizontal, from the outside bottom edge of the footing or wall.

3.6. **Rock Removal:** Where rock is encountered in trenching, the rock must be removed to not less than 3 inches below the installation level of the bottom of the pipe, and the trench must be backfilled to the installation level of the bottom of the pipe with sand tamped in place so as to provide uniform load-bearing support for the pipe between joints. The pipe, including the joints, must not rest on rock at any point.

3.7. **Soft Load-Bearing materials**: If soft materials of poor load-bearing quality are found at the bottom of the trench, stabilization must be achieved by over excavating not less than two pipe diameters and backfilling to the installation level of the bottom of the pipe with fine gravel, crushed stone or a concrete foundation. The concrete foundation must be bedded with sand tamped into place so as to provide uniform load-bearing support for the pipe between joints.

PART 4. PIPE SUPPORTS, PIPE HANGERS AND MISCELLANEOUS SUPPORTS

4.1. **General:** Refer to the plan details and these specifications for various piping support requirements.

Provide factory fabricated galvanized pipe hangers and supports for all piping, complete with properly sized bolts, washers, clamps, etc. and with coatings and finishes specified below, and all as required for a complete and safely functioning installation. Material items, methods and general requirements not covered in this

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specification must be provided in strict accordance with current edition of Manufacturer's Standardization Society Specification MSS SP-58 and Manufacturer's Published Product Information.

All hangers, supports, related components and assemblies must be sized for a minimum of 300% (3 times) the anticipated load carried by the respective item. Where the Contractor has doubt as to proper supporting requirements, he must consult with, and seek the guidance of, the Architect and the project Structural Engineer for resolution.

Where in contact with bare copper pipe provide same assembly except it must be copper, continuous-thread rod, nuts, and washers made of copper-coated steel.

Hangers must be manufactured by Elcen Metal Products Co., Fee & Mason Mfg. Co., ITT Grinnell Corp, B-Line Systems or preapproved equivalent.

4.2. **Coatings and Finishes:** Pipe hangers, Unistrut pipe supports and duct Unistrut support assemblies of galvanized, zinc and similarly coated items are considered to **NOT** be coated. All must be painted, powder coated, epoxy coated or plastic coated. Hanger rods and associated bolts, and clamps on Unistrut assemblies are not required to be painted or coated.

All damaged or rusted steel pipe, all uncoated cast iron pipe, and all hangers, Unistrut and other support assemblies, must be cleaned, primed and painted with two coats of compatible black enamel paint as specified below. Any rusted items must have the rust removed, then etched and primed for painting as recommended by the respective manufacturer. After prepping the surfaces, then paint with two coats of compatible black, rustproof enamel paint. Do not use spray paint.

All paint and coatings must have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. See specification section, "Identification" for additional requirements.

In lieu of painted surfaces as specified hereinbefore, the Contractor may provide factory fabricated hangers and Unistrut assemblies with rust resistant powder coating, epoxy coating or plastic coating. All paints/coatings/finishes must meet or exceed a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84.

4.3. **Hangers at Typical Single Suspended Horizontal Pipe:** Galvanized adjustable clevis or split-ring type equal to Elcen Fig. 12 or 10c. Refer to Coatings and Finishes above for additional requirements. See other specifications and plan details for additional requirements. See part "Hanger Rods" below for limitations on use of clevis hangers.

Where in contact with bare copper pipe provide same assembly except it must be copper, continuous-thread rod, nuts, and washers made of copper-coated steel.

4.4. **Manifolds and Parallel Runs:** At his option, Contractor may provide a Unistrut system complete with fittings, clamps and accessories required and specified. Horizontal and vertical mounted piping must all be secured to each Unistrut hanger assembly. Refer to the plan details and specifications for requirements. Refer to Coatings and Finishes above for additional requirements. Refer to "Hanger Rods" below for locations that require a Unistrut assembly. Furnish for review proposed system components.

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Where in contact with bare copper pipe provide same assembly except it must be copper, continuous-thread rod, nuts, and washers made of copper-coated steel.

4.5. **Spacing:** Install supports as required or specified to prevent sags, bends or vibration. Provide additional building supports and attachments where support is required or specified for additional concentrated loads, including valves, in-line pumps, flange guides, strainers, expansion joints and at all changes in direction of piping.

At no-hub pipe, support as specified below for cast iron piping.

In all cases, provide on all sides of, and within 12 inches of, all elbows, take-off fittings, joints, valves, any change in direction of item supported, at ends of branches over 5 feet long and on centers not exceeding the following:

Piping Material	Pipe Size	Maximum Spacing
Copper Piping/Tubing (Water)	1 1/4” or less	6 ft. Horizontal 8 ft. Vertical
	1 1/2” or larger	8 ft. Horizontal 8 ft. Vertical
Cast Iron	All	4 ft. Horizontal 12 ft. Vertical

Where horizontal cast iron pipe is installed in 10ft. lengths, spacing must be increased to 9 ft. In addition to specified cast iron support requirements, provide additional support for cast iron pipe within 6” of each fitting on all sides of the fitting.

PVC	All	4 ft. Horizontal 8 ft. Vertical

Where vertically installed piping is provided, a guide must be installed midway between the specified/required vertical supports, at the base of each riser and at each floor. Such guides must prevent pipe movement in a direction perpendicular to the axis of the pipe.

4.6. **Protection of Physical Damage for Piping:** In concealed locations where piping is installed through holes or notches in studs, joists, rafters or similar type members, the pipe must be protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (16 gage) must cover the area of the pipe where the member is notched, drilled or bored, and must extend not less than 2 inches above sole plates and below top plates.

4.7. **Hanger Rods:** Must be mild steel, hot dipped galvanized, threaded as required. Rods must be selected as specified hereinbefore. Use not smaller than 3/8” rods for pipe 2” and under, 1/2” rods for pipes 2 1/2” through 4", 3/4” rods for 5” through 12” and 1” rods for piping over 12”. Support rods with threaded Underwriters listed inserts, expansion shields or beam clamps must be all galvanized. Beam clamps must be equal to Elcen Fig. 34 or 36 with rod and eye end.

Where in contact with bare copper pipe provide same assembly except it must be copper, continuous-thread rod, nuts, and washers made of copper-coated steel.

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At bar joists, support from bottom chord at panel points. For piping over 6” provide supplemental steel angle supports and welding to span 3 joists when running parallel to joists and welded angle between two panel points for piping running perpendicular to joists. Concrete inserts must be equal to Grinnell Figure 282.

Wherever piping hanger support rods heights exceed 36” length from top of the supported item to the structure above, Contractor must provide a Unistrut support assembly and bracing of the assembly with minimum 1”x1”x1/4” angle iron or as required for the weight of the supported item, whichever is greater, and anchor to structure above to prevent swaying. Assembly must be welded at the connection to Unistrut and building structural assembly. Follow welding procedures set forth in the structural division of the specifications.

4.8. **Bracing:** Where hanger rods heights exceed 36”, provide sway bracing as specified above in “Hanger Rods”. Bracing must be provided at each Unistrut assembly and attached to the building structural system.

4.9. **Approved Equivalents:** By Grinnell, Elcen, Stockham or Crane will be accepted.

PART 5. IDENTIFICATION REQUIREMENTS

5.1. **Identification: All of the above ceiling identification specified must be completed prior to the above ceiling site visit. All remaining identification must be completed prior to the final site visit.**

The State of Alabama Department of Construction Management (DCM) will cancel on-site, the site visit if not completed as specified. Failure to comply with this provision will be cause for cancellation of the site visit, and a fee imposed for the additional site visit, with all costs of the additional site visit to be borne by the Contractor.

All identification must follow the nomenclature used on the plans.

All equipment, fire dampers, filter access locations, access panels, access doors, motor starters, disconnects, thermostats, sensors, valves, trap primers, control systems components, switches and any other items or devices which cannot be readily identified by the Architect, Engineer or Owner and his personnel, must be equipped with engraved laminated plastic nameplates, as described below.

Identify all access openings/panels/doors to indicate item for which access is provided. Ex. Fire damper, valves, coils, etc. Additionally, add the following to each access identifier: “***ACCESS - DO NOT BLOCK***.”

All above ceiling identification must have a corresponding engraved plastic label identifier neatly attached to the ceiling grid below the aforementioned equipment, item, valve, access door, etc. Attach to the ceiling grid with permanent adhesive. The engraved plastic labels background must match ceiling grid color with contrasting black or red letters as desired by the Architect. The label must have engraved on it the item being identified and its designation as shown on the plans, valve chart, etc. Refer to Section “Identification” below for additional requirements.

Engraved equipment designation and numbers must be as shown on the Mechanical and Plumbing drawings on the upper half of tag, leaving lower half of tag for future engraving by Owner. Where equipment is typed (EF-A, etc.) rather than numbered

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(EF-1, etc.) the tag must include the room number(s) of the area served. Room numbers must be designated by the Owner. In absence of Owner's room numbers, numbers must be as indicated on the architectural plans or as numbered for the original piece of equipment.

Identify all piping located in concealed areas above ceilings and exposed to view in finished spaces, all new water piping, jacket of all insulated pipe and all pipe exposed to view and/or accessible through removable ceilings, attics, access panels, etc... Sanitary vent piping above the ceiling, in chases and similar areas, are not required to be identified.

Identification must be visible from all sides of the piping, bear name of pipe contents and show direction of flow. Install identification within 12" of all flanges, valves, fittings, elbows, change in piping direction, at each branch take-off, both sides of floor and wall penetrations, and along all straight runs of pipe not further apart than 15 feet. In the case of gas/air systems, the identification must also indicate pressure of the pipe contents.

Piping identification must be provided over every space, including small areas (closets, storage rooms, etc.) above accessible ceilings. All piping identification must be installed such that the Owner or maintenance personnel can remove any ceiling tile and visually identify any overhead piping with the specified identification markers.

Pipe labels must be factory fabricated, flat wrap-around markers that completely surround the pipe. The markers' colors, designations, etc., must comply with IBC/IPC/IMC requirements, ANSI/ASME Standard A13.1 and ANSI Z535.1, current editions. Markers must be Seton "Snap-Around" or Seton "Strap-Around" pipe line markers, Marking Services Inc (MSI) Series MS-970, Kolbi Pipe Marker Co., Brimar or approved equivalent. **Stick-on, painted, stenciled, hand written or any non-factory fabricated type identification is not allowed.**

Fit all Plumbing dielectric unions and all plumbing valves (except equipment service valves) with a custom laser engraved brass valve tag at each valve and dielectric union and include on the specified valve chart. Tag must be 1-1/2 inches in diameter, 18-gauge polished brass tags with 3/16-inch chain hole and 1/4-inch-high stamped, black-filled service designation. Number tags in sequence, starting with number 1; prefix the number with "P" for plumbing items. After numbering plumbing valves, also indicate valve numbers on the record/as-built drawings.

Provide a valve chart laminated and framed which shows the valve number and location of each valve and dielectric union, and type of service of each valve (Cold water, hot water, hot water circulating, etc.). Locate a valve chart in each water heater room and each janitor closet. Permanently attach each chart to the wall as directed by the Architect. All valves' numbers must also be shown on the Record drawings. Include a copy of the valve chart and the record drawings with the valves and dielectric union identification in the Owner's Operation and Maintenance Manuals.

In addition to valves identification specified above, provide an engraved laminated label, of the type specified above, and glue to the ceiling tile grid below the valve for each valve concealed from view. Where there is more than one valve located within a span of eight (8) feet, above the ceiling, it is not necessary to provide multiple identifiers on the ceiling grid. It will be acceptable to place a single identifier on the ceiling grid reading as, "Water Valves". Each valve above the ceiling is still required to have its own individual valve tag and identified on the specified valve chart.

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Example: Over the toilets ceiling, there may be multiple shut-off valves to each individual fixture instead of to a bank of fixtures. Where there are multiple valves for each fixture, the Contractor may attach a single identifier on the ceiling grid that states, “Water Valves”, or similar description. Thereafter, each individual valve above the ceiling still requires its own engraved valve brass tag as originally specified. The intent is to NOT have multiple individual identifiers for each valve exposed to view on the ceiling grid and thereby creating an undesirable appearance.

Access openings/panels/doors to all items requiring access must be permanently identified on the exterior of the access panel and on the ceiling grid below by a label having letters not less than 3/4” in height and reading: ***“XXX – DO NOT OBSTRUCT ACCESS“*** where “XXX” is the item requiring access.

Permanently affixed warning labels must be attached to all equipment, inside the facility and outside of the facility, on a highly visible location on the equipment, which can be automatically started. The warning label must read as follows: ***“CAUTION!! This equipment is operating under automatic control and may start or stop at any time without warning. Place disconnect switch in the “OFF” position before servicing or attempting to work on equipment.”***

Permanently affixed warning labels must be attached to all motor starters and all control panels which are connected to multiple power sources utilizing separate disconnect switches. The warning labels must read as follows: ***“THIS EQUIPMENT IS FED FROM MORE THAN ONE POWER SOURCE WITH SEPARATE DISCONNECTS. DISCONNECT ALL POWER SOURCES BEFORE SERVICING OR WORKING ON THIS ITEM”***

Labels must be Norplex-Micarta stock meeting ASTM D709, a minimum of 3" x 3" x 1/8” thick, laminated plastic labels (larger if needed) with engraved, all caps, 3/8” high, 1/8” stroke letters for thermostats, CO2 sensors and similar control devices in the finished space and 6" x 4" x 1/8” thick, laminated plastic labels (larger if needed) 3/4" high x 1/4” stroke numerals and all capital letters to identify all items furnished under Division 15 specifications, to include all warning signage, access panels, equipment and all other items above the finished ceiling requiring identification.

Labels attached to the ceiling grid must be the same width as the ceiling grid to which it is attached. Properly adjust lettering height to fit within the smaller width label. Labels color on the ceiling grid must match the ceiling grid and be provided with contrasting black or red letters as desired by the Architect.

All items above the ceiling or in mechanical rooms, attics, mezzanines and similar type spaces must be red with white lettering.

Where the tag, label or marker occurs in a plenum (return air) space, the material employed must carry a Class A Flame Spread Rating per ASTM E84. If the material does not meet the Class A Flame Spread Rating per ASTM E84, provide custom laser engraved, 0.029” thickness, red, 316 Stainless Steel with white letters. Sizes, letter heights, etc., and colors must be as specified for the laminated plastic labels specified hereinbefore.

All piping exposed to view in unoccupied finished spaces, mechanical rooms, plumbing chases, housekeeping and similar spaces, and jacket of insulated piping exposed to view in mechanical rooms, janitor/housekeeping and similar type spaces must be painted with two coats of compatible enamel paint in accordance with IBC/IPC/IMC color requirements and ANSI Standard A13.1, current edition. Do not

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use spray paint. After piping is painted, identify with pipe markers, valves tags, etc. as specified hereinbefore.

Exposed piping and the jacket of insulated piping in occupied finished spaces must be painted with two coats of compatible enamel paint, with color selected by the Architect.

Painting of the jacket of the insulated piping is not required where a protective aluminum jacket is specified and provided. Provide identification markers as specified hereinbefore on piping with aluminum jacket. Refer to Sections 15400 and Section 15700 for piping requiring aluminum jacket.

PART 6. MISCELLANEOUS REQUIREMENTS

6.1. **Materials and Equipment:** New and of best quality in every respect. Pipe and fittings must conform to the ASTM Standard designated for pipe of each material. Equipment must bear Underwriters Laboratories Inc. (UL) listing label, Canadian Standards Association (CSA) listing label or ETL approved rating.

All electrical components and products must also comply with the respective Code of Federal Regulations (CFR). All pressure vessels must be constructed and tested in accordance with applicable ASME Codes and must bear ASME stamps unless specified otherwise. Minimum pressure rating must satisfy job conditions.

All equipment must be provided by the same manufacturer throughout the project. No mix matching of equipment Manufacturers is allowed. Where units of the same class of equipment are required or specified, these units must be products of a single manufacturer, however, the component parts of each unit need not be.

No materials or products that contain asbestos, formaldehyde, lead or mercury, in excess of limits mandated and defined by OSHA, LEED and the EPA, must be utilized.

Where conflicts occur between a Code, Standard, Listing and the contract drawings or contract specifications, the most stringent requirements must govern and be applied.

6.2. **Workmanship:** Workmanship must be first class, premium and in accordance with superior practice. Work must be executed by experienced mechanics and must present a neat and professional appearance. Exact location of pipe, duct, equipment, etc., must be determined in field, considering work of other trades. Do not attach any items to other trades' assemblies. Items must be separately attached to the building structural system. Except in unfinished areas and where specifically indicated on the plans or approved in writing, ductwork, piping, conduit, wiring, and similar items must be concealed in the construction.

Aboveground piping must run parallel with the lines of the building, unless otherwise indicated. Branch pipes from water service lines may be taken from top, bottom, or side of main, using crossover fittings required by structural or installation conditions. Refer to the plan details and other specification sections for gas piping and compressed air piping take-off requirements. Supply pipes, valves, and fittings must be kept a sufficient distance from other work and other services to permit not less than 1 inch between finished covering on the different services. Bare and insulated lines must not bear directly against building structural elements so as to transmit

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sound to the structure or to prevent flexible movement of the lines.

Lines required to be sloped have the right of way over those not required to be sloped. Lines whose elevations cannot be changed have the right of way over lines whose elevations can be changed. Lines and equipment whose locations are dimensioned have precedence over lines and equipment not dimensioned.

Pipe must be clean, cut clean, properly reamed, threaded or soldered, erected plumb and secure. Make changes in pipe size by reducing fittings without the use of bushings. Install all items in accordance with manufacturer's recommendations. Absolute coordination is required with the other Contractors on the project before proceeding with installation of any system or item.

At all stages of installation, protect pipe openings, floor drains, hub drains, fixtures, ductwork, condenser coils and equipment against the entrance of foreign materials and from damage by the elements, mortar, concrete, paint, etc. Plugs of rags, wool, cotton, waste or similar materials are not acceptable.

If air moving equipment must be used during construction, temporary filtration media with a Minimum Efficiency Reporting Value (MERV) of 11 must be installed at each return air grille, return air register, exhaust grille, exhaust register, and unit return air inlet. ALL open portions of ductwork and equipment must be covered with self-adhesive film (not Visqueen) or airtight sheet metal caps to prevent the intrusion of contaminates.

All equipment openings, duct openings, duct take-offs, etc., must be protected immediately after the tap, take-off, opening, etc. has been fabricated in the field. In effect, there must be no ductwork opening or equipment opening that is exposed to the ambient air. The material must be a minimum of 3 mils thick and have a minimum tensile strength of 10 psi. It must be waterproof and recyclable. Material must be DuroDyne Dyn-O-Wrap or approved equivalent.

Where bare sheet metal is delivered unassembled to the job site, all ductwork must be covered and protected with Visqueen. After fabricating the duct in the field, the interior bare metal must be wiped clean with a clean damp cloth before installing in the field. After installation, the duct must be protected as specified above. Any ductwork discovered to be unprotected as specified is subject to immediate rejection for use on this project.

6.3. **Testing Documentation:** Throughout the Division 15 specifications, there are various tests required and specified. Provide the Architect written certification and results of all tests specified, including those indicating failure. The absence of written testing certification and results will be considered the same as if testing was never done. Include all testing documentation in the Operating and Maintenance Manuals.

6.4. **Factory Finishes:** Furnish to the Architect, color cards for standard and premium colors available. The Architect must select color where choices exist. Provide Manufacturer’s standard color where color choices are not available. Coordinate all color selections with appropriate Architectural specification sections.

6.5. **Expansion:** Provide for expansion and contraction of all piping, ductwork, etc. and make proper provisions so that excessive strain will not occur on piping, ductwork or other parts. Provide flexible connections for all piping and ductwork at all building expansion joints.

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6.6. **Safety Provisions:** Provide covers or guards on all hot, moving, projecting items and at any other location that could be construed by the Engineer, Owner or Architect as a hazard.

6.7. **Cleaning and Adjusting:** Upon completion of work, clear all drains, traps, fixtures, ducts and pipe. Adjust all valves, remove rubbish and leave work in clean and excellent operating condition. Clean and polish all floor drains, floor and wall cleanouts, wall hydrants and any other exposed metal objects.

Install final permanent type filters only after cleaning of building is completed.

6.8. **Escutcheons:** Where pipes pass through cabinets, walls and ceilings of finished rooms provide one-piece, cast-brass type with polished, chrome-plated finish and setscrew fastener or stainless steel type securely fastened in place. Do not use split ring type escutcheons.

Pack penetrations with mineral wool insulation, seal with firestopping compound and install escutcheons to prevent passage of fire, smoke and vermin.

6.9. **Delivery and Storage:** All equipment and materials delivered and placed in storage must be protected from the weather, humidity and temperature variations, dirt and dust, and other contaminants. See Section 15700 and this Section 15010 for additional requirements for ductwork and equipment.

6.10. **Dielectric Isolation:** Provide dielectric isolation where dissimilar metals are joined, at supports, etc. For pipe sizes 2” through 6”, copper piping flanges must be drilled to ANSI B 16.5 150/125 Standard and powder coated, with an EPDM insulator adhered to the plate steel flange protruding inside of the steel flange to prevent contact with the copper flange adapter. The copper component of the flange adapter must be Third Party Classified by Underwriters Laboratories, Inc. Minimum working pressure must be 300 psi at 272°F.

6.11. **Miscellaneous Bonding/Grounding of Metallic Items:** Wherever any bare metallic piping, conduit, structural elements or any other metallic assembly is in contact with externally insulated duct or bare sheet metal duct, bonding/grounding must be provided. The Contractor must provide 1/2” thickness, unslit AP Armaflex insulation of sufficient inside tubular diameter to snuggly and completely cover the respective metallic item. The insulation must extend the full length of the affected area. Where channel shapes are used, orient the open side of the Unistrut assembly down. Materials that are not supported by Unistrut, sheet Armaflex may be used provided it is properly attached to the duct or affected items. Refer to Section 15700, Part “Pipe and Miscellaneous Insulation Work” for AP Armaflex material specification.

END OF SECTION

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SECTION 15400

PLUMBING

PART 1. GENERAL & MISCELLANEOUS

1.1. **General Provisions:** Section 15010 is applicable in full hereto. No building materials or products that contain asbestos, formaldehyde, polychlorinated biphenyl (PCB), lead or mercury, in excess of limits mandated and defined by OSHA, LEED and the EPA, must be utilized.

Do not fabricate, or install, any pipe or equipment until all coordination has been accomplished. Refer to Section 15010 for coordination requirements.

1.2. **Qualifications:** The Plumbing Contractor and the required third party Insulation Contractor must be properly licensed and established at the location of the work and must maintain locally adequate service facilities. They must have had previous experience in the satisfactory installation of at least six (6) systems of this type, size, complexity and scope.

1.3. **General Scope:** Include all equipment, material and labor required for a complete operating plumbing system even though every item involved is not indicated. Refer to architectural drawings and verify all plumbing fixture's locations and mounting heights. Notify the architect prior to bidding of any discrepancies. Do not attach any items to other trades' assemblies. Items must be separately attached to the building structural system.

The Plumbing Contractor must not install the piping insulation. All piping insulation work must be provided by a third party licensed and experienced insulation subcontractor whose primary business is the sale and installation of insulation materials in accordance with the insulation manufacturers' recommendations and these specifications. **The insulation sub-contractor must provide a complete insulation submittal on his company letterhead detailing materials and methods as specified. The plumbing submittal will be automatically rejected and not be reviewed without a submittal from the specified insulation sub-contractor.**

Advisory provisions listed in all Codes referenced in the Contract Documents are mandatory. Codes are minimum requirements. Where conflicts occur between a Code, Standard, the contract drawings or these specifications, the more stringent requirements must govern and be applicable.

Manufacturers not mentioned in the specifications require prior approval, seven (7) days prior to bid date. Follow procedures set forth in Division 1 and Section 15010 of the specifications. All prior approvals must be submitted through the Architect.

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Arrange and install piping systems sizes as shown, as close as practical, straight, properly supported and run as directly as possible forming right angles or
running parallel with building lines, true to line and grade, free of sags and bends. Locate piping as high as practical and in parallel groups as close together as practical.

Demolish and modify existing roof, walls, floors, partitions and ceilings as required to accomplish the required work. Remove existing carriers, valves, hangers, supports, existing water and waste piping, saw cut floors, walls, partitions, ceilings, etc., as shown and as required to install new piping or reconnecting to existing waste and water rough-in. Do not reuse any existing hangers, supports, valves, etc. All items must be new.

All penetrations of floors and partitions are required to be built-in as work progresses. All penetrations of new construction that were not built-in as required by these specifications, and all existing floors, walls and existing partitions must be core drilled or sawcut large enough to allow all conduits, piping, firestopping assemblies, etc., to continue uninterrupted, and to provide proper firestopping of the penetration as required to install new items as shown and/or specified.

Reconstruction and repair of the demolished/modified items must be as directed by the Architect. Coordinate demolition and repairing/rebuilding of items with General Contractor prior to bid to allow for installation of carriers, piping, etc., as applicable.

All piping must be clean and rust free when it is installed. Before installation, it must be checked, upended and swabbed. All rust or dirt from materials in storage or from lying on the ground must be removed. Any dirty piping installed must be cleaned. Any rusted piping must have the rust removed, etched and primed for painting as recommended by the respective piping manufacturer, and then painted with two coats of black, compatible, rustproof enamel paint. Do not use spray paint. Refer to gas piping specification for requirements of gas piping painting. The paint must comply with the requirements of ASTM E84 for flame spread and smoke development.

1.4. **Record Documents:** Provide in such detail, as is set forth under General and Supplemental Conditions and in Section 15010. Also, show locations of all dielectric unions, cleanouts and all valve numbers on the record documents.

1.5. **Access Panels and Doors in Finished Areas:** Do not locate serviceable items above inaccessible, hard ceilings or in partitions without written approval from the Architect. Coordinate all items locations with the Architectural plans before installing any items. Furnish access panels and doors to the General Contractor for installation wherever required for access or maintenance to any items including but not limited to valves, controllers, actuators, trap primer assemblies, water hammer arrestors, air vents, cleanouts, etc.

Access panels/doors in finished areas or areas exposed to view must be suitable for wall or ceiling finish involved, 24" x 24" unless otherwise indicated

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or as required to permit removal of equipment and provide acceptable maintenance access. Access panels and doors must be fire rated where rated assemblies are penetrated.

Access panels and doors must be manufactured by Milcor, Elmdor, Zurn, Mifab or approved equivalent. The Architect must approve the use of, and type of, all panels and doors to be installed in areas that are exposed to view or in finished areas.

Access panels/doors exposed to view and in finished spaces must be factory cleaned and primed for painting in the field. Colors must be selected by the Architect. Refer to Architectural Section, Painting, for additional information.

Refer to Section 15010, Part Access Panels and Doors for additional requirements.

1.6. **Warranty:** Guarantee work as set forth in Section 15010 and Division 1. Guarantee in writing to make good without cost any defects in materials and workmanship for one year following the date of substantial completion of the project as determined by the Architect, unless specified otherwise. Flush valves and faucets must be provided with a complete replacement, including labor, and a five year guarantee in the event of failure. Provide free maintenance and service during the guarantee period. Refer to other parts for additional requirements and extended warranty requirements.

1.7. **Site Visits:** It is the contractor's responsibility to have the job ready for site visits when they are scheduled. If the project is not ready for the requested site visit and the Architect, any governmental agency or any other entity requires an additional site visit with the Engineer present, the contractor must pay Zgouvas, Eiring & Associates a re-visit fee of $2,000. The payment must be made directly to Zgouvas, Eiring & Associates 5 days prior to the scheduled site visit.

The Contractor is urged to carefully review the extensive requirements of Part "Identification" in Section 15010 of the specifications and note that certain identification **is required to be completed before certain site visits. There are specific identification requirements prior to the above ceiling and final site visits, respectively, that are mandatory. The State of Alabama Department of Construction Management (DCM) will cancel on-site, the site visit if not completed as specified. Failure to comply with this provision will be cause for cancellation of the site visit, and a fee imposed for the additional site visit, with all costs of the additional site visit to be borne by the Contractor.**

1.8. **Governmental Inspections:** The Plumbing Contractor must arrange and pay for the State of Alabama Boiler and Pressure Vessel Safety Division/Inspection Divisions, Elevators/Boilers Inspector to visit job site to inspect water heater and/or boiler installation and obtain written approval, certification and Certificate for Potable Water Heater (PWH) as required. The written approval, certification and Certificate for Potable Water Heater (PWH) must be provided and be attached to the respective item prior to the date of the final site visit.

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Failure to provide the aforementioned requirement prior to the final site visit will be cause for cancellation of the site visit by DCM and a reinspection fee imposed.

Correct all deficiencies required by the Inspector without additional cost to the Owner or the Owner's Project Design Professionals, using materials and methods, as directed by, State of Alabama Boiler and Pressure Vessel Safety Division/Inspection Divisions and Elevators/Boilers inspector as required.

1.9. **Miscellaneous:** Bidders must visit the site and become acquainted with all job conditions that may affect the work shown on the plans. Report to the Architect, prior to bid, any new or existing conditions that require modifications to accomplish the installation of all items. Provide for required adjustments to complete the intent of the work. No consideration will be given after bid opening for alleged misunderstanding regarding new or existing job conditions, utility connections, permits, fees, construction documents, etc.

The Contractor must carefully examine the contract documents during the bidding phase. Any missing information, clarifications, etc. in the contract documents that is required to provide accurate pricing must be brought to the attention of the Architect, **prior to bid date**, so all may be clarified and/or corrected. Failure to identify and resolve any issue prior to bid must require the Contractor to provide said items, complete, without additional cost to the Owner or the Owner's Project Design Professionals, using materials and methods specified by, and as directed by, the Owner's Design Professionals.

Refer to Section 15010 for additional requirements.

1.10. **Spare Parts:** Manufacturer of any equipment specified must have a wholesale outlet for readily available replacement parts in the nearest major USA city.

1.11. **Electrical Work:** All electric power wiring required for installation of equipment under this Section is specified under the Electrical Division. The Plumbing Contractor must furnish and install all controls and control wiring as specified or required to properly complete the installation. Control conduit is specified under the Electrical Division or shown on electrical drawings; all other control conduit must be provided under this Section of the work.

All control conduit, power wiring, relays, transformers, contactors, etc. which are required and are not shown on the electrical drawings or specified in the Electrical Division of the specifications, must be provided under this Plumbing Section.

Coordinate all requirements with the Electrical Sub-Contractor prior to bid. Electrical work performed under this Section must meet the requirements set forth in the Electrical Division and the National Electric Code (NEC), current edition.

1.12. **Submittals:** Refer to Section 15010 for **strict requirements** and, especially as it applies to format, project cost constraints, addendums and Value Engineering

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(VE) items.

Only <u>ONE</u> complete submittal will be accepted for review. Providing submittals piecemeal is not allowed. If a partial or incomplete submittal is provided, it must be cause for immediate rejection.

1.13. **<u>Identification:</u>** The Contractor is urged to carefully review the extensive requirements of Part "Identification" in Section 15010 of the specifications and note that certain identification is required to be completed before certain site visits. **There are specific identification requirements prior to the above ceiling and final site visits, respectively, that are mandatory. The State of Alabama Department of Construction Management (DCM) will cancel on-site, the site visit if not completed as specified. Failure to comply with this provision will be cause for cancellation of the site visit, and a fee imposed for the additional site visit, with all costs of the additional site visit to be borne by the Contractor.**

1.14. **<u>Firestopping:</u>** Refer to Section 15010, Part "Partial Work to be Coordinated With Other Trades", Paragraph "Firestopping". **Note that Division 15 firestopping specifications require firestopping of all penetrations regardless of wall/ceiling/floor construction. Refer to Division 1 regarding additional requirements.** Where there is a conflict between Division 1 specifications and Division 15 specifications, the most stringent requirements must govern, be applicable and must be provided.

1.15. **<u>Motors</u>:** All furnished motors must be designed, manufactured, and tested in accordance with the current applicable standards of NEMA, ANSI, IEEE, and ASTM. As a minimum requirement, all motors must conform to the current applicable sections of NEMA Standard No. MG-1. Motors must meet or exceed The Consortium for Energy Efficiency (CEE) Premium Efficiency full load efficiencies. All motors must be listed under the UL recognized component file as applicable. All motors must be suitable for installation according to the requirements of NEC. Motors must be wound for the specified voltage and a 1.5 service factor, 1750 RPM open drip proof construction unless otherwise shown or specified.

All motors must be provided with overload protection and phase protection on all legs. Do not run motors until correct overload elements are installed in starters, as applicable.

All motors serving outdoor equipment exposed to weather must have TEFC motors meeting the requirements set forth previously.

Premium efficient motors must be **warranted for 36 months** from the date of substantial completion of the project, as determined by the Architect. Motors must be by Allis Chalmers, General Electric Goulds, Louis Allis, and Westinghouse or an approved equivalent.

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1.16. **<u>Operating and Maintenance Manuals</u>: Two weeks before the final site visit**, furnish three complete sets of operating and maintenance instructions, bound in hard cover, indexed and tabbed.

The Contractor must also provide this information in digital Adobe Acrobat PDF format, on a CD-R CD. The PDF file must be provided with an embedded index for each specified item. The index must appear in the left hand window of the opened document so that the Owner or his maintenance personnel can “click” on the indexed item and move immediately to that specific item.

Minimum requirements for the Operating and Maintenance Manuals must be as follows:

a. The first page of the bound instructions must be a listing of:

    1. The Owner/Project Title.
    2. The Architect and Architect’s Job Number.
    3. The Engineer and Engineer’s Job Number (Found in the Engineer’s Logo in the Bottom Right Corner of the Plumbing Plans).
    4. The General Contractor and Contact Information.
    5. The Plumbing Subcontractor and Contact Information.

b. Second page must be a Table of Contents listing all products in the order which appear in the specifications and label the tab accordingly. Include all “P” numbers for fixtures, water heater numbers, valves, floor drains, etc.
c. The third page must be a summary page that lists each item with its respective warranty listed, including all extended warranties.
d. All warranty card information must be filled in by the Plumbing Contractor; Serial numbers, Model Numbers, etc. all as required for proper warranty registration. The warranty registration date must be the date of substantial completion as determined by the Architect.
e. Provide copies of all filled in warranty cards.
f. Provide a local source of supply for parts and replacement, including names and telephone numbers of parts suppliers.
g. Provide a general maintenance summary section. Section must be a list of each piece of equipment or device using the designations as shown on the plans, and the routine maintenance procedures based on the respective manufacturer’s recommended intervals. As a minimum, maintenance must be grouped and individually tabbed to indicate maintenance operations required:

    1. Once a month
    2. Quarterly
    3. Once every six months
    4. Once a year

h. Provide drawings of system controls and wiring diagrams and condensed operating instructions. Include hard copy in binder and digital copy on CD in PDF format. All components must be numbered and identified on the

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diagram. Laminate, frame under plastic and mount in each mechanical/water heater room(s) in an optimally viewed location for the respective equipment.

i. Provide written results of all specified tests.
j. Copies of all Site Visit Reports including Contractor's written response that items listed were corrected.
k. Copies of all certificates of all site visits, comments and approvals from all Governing Authorities, to include all water heater and pressure vessel inspections by the Authority having jurisdiction.
l. Provide domestic water samples testing and results specified.
m. Provide a copy of the valve chart required in Section 15010, Part Identification. Include all dielectric unions on chart.
n. Provide copy of Section 15010 and 15400 Specifications.
o. Provide a copy of all shop drawings/submittals.
p. Provide record drawings of the Plumbing drawings, in hard copy and PDF format on CD. Refer to Section 15010, Part 1, General, Paragraph, Record Drawings for detailed requirements. Record drawings must indicate the valve numbers from the required valve chart, all clean outs and all dielectric unions.

PART 2. TESTS

2.1. **General: Do not test when freezing conditions exist or are anticipated. Test when freezing conditions have subsided.** Perform all tests in the presence of the Architect. Refer to Division One for Fuel, water and power required, therefore. In absence of specific testing procedure comply with code requirements and/or nationally acceptable industry standards. Furnish written reports of all tests results specified to Architect.

Once the tests are conducted as specified below, seal any leaks discovered, and then repeat the testing process until all tests are successfully completed and the systems are fully verified.

2.2. **Drainage and Vent System Pretest: Do not test PVC or any non-metallic piping with compressed air.** A water test must be applied to the drainage system in its entirety. All openings in the pipe must be tightly closed and sealed air tight with cast iron or PVC caps as applicable for the pipe installed, except the highest opening. Then, the system must be filled with water to the point of overflow.

If the system is tested in sections, each opening must be tightly closed and sealed air tight with PVC or cast iron caps as applicable for the pipe installed, except the highest openings of the section under test. Each section must then be filled with water. Sections must not be tested with less than a 10-foot head of water. In testing successive sections, not less than the upper 10 feet of the next preceding section must be tested so that no joint or pipe in the building, except the uppermost 10 feet of the system, must have been submitted to a test of less than a 10-foot head of water.

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Test pressure must be held for not less than 8 hours. Check all portions for leaks. Correct all leaks and retest. The system must then be tight at all points.

Do not test when freezing conditions exist or are anticipated. Test when freezing conditions have subsided.

2.3. **Drainage and Vent System Final Test: Do not test PVC or any non-metallic piping with compressed air.** A smoke test must be utilized as a final test. It must 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 as required to achieve the specified pressure. **Do not test when freezing conditions exist or are anticipated. Test when freezing conditions have subsided.**

When the smoke appears at stack openings on the roof, the stack openings must be sealed air tight with PVC or cast iron caps and a pressure equivalent to a 1-inch water column must be held for a test period of not less than 8-hours. Check all piping visually for smoke leakage and odors and correct all leaks.

The final test of the completed drainage and vent systems must be visual and in sufficient detail to determine compliance with the provisions of the International Plumbing Code.

2.4. **Water Supply System Test:** Test and secure acceptance of entire system before the piping is insulated or otherwise concealed. **Do not test when freezing conditions exist or are anticipated. Test when freezing conditions have subsided.**

Disconnect and cap all outlets to all plumbing fixtures and all other equipment not designed for the full test pressure. Fill the system with water and prove tight under a water pressure not less than the working pressure of the system; or, for piping systems other than plastic, by an air test of not less than 50 psi. **Do not test plastic piping with air.** This pressure must be held for not less than 10 hours without a loss of pressure.

The water utilized for the test must be obtained from a clean potable source of supply. All piping throughout must be air tight under test. Water piping must remain under normal water pressure during construction except when freezing weather is expected.

2.5. **Natural Gas Piping System:** Test before equipment, appliances, etc. are connected. The test pressure to be used must be not less than 1-1/2 times (1.5x) the proposed maximum working pressure, but not less than 3 psig, irrespective of design pressure.

Where the test pressure exceeds 125 psig, the test pressure must not exceed a value that produces a hoop stress in the piping greater than 50 percent of the specified minimum yield strength of the pipe. The test duration must be not less than 1/2 hour for each 500 cubic feet of pipe volume or fraction thereof.

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When testing a system having a volume of less than 10 cubic feet, the test duration must be not less than 8 hours and no more than 24 hours. The piping system must withstand the test pressure specified without showing any evidence of leakage or other defects.

The leakage must be located by means of an approved gas detector or a noncorrosive leak detection fluid. Where leakage or other defects are located, the affected portion of the piping system must be repaired or replaced and retested. The purging of piping systems must be in accordance with the provisions of IFGC 2021, Sections 406.7.1.1 through 406.7.1.4.

2.6. **Compressed Air:** Apply one hundred- and fifty-pounds air for 24 hours until proven tight.

2.7. **Fixtures:** Test for soundness, stability of support and satisfactory operation.

PART 3. SANITARY PIPING

3.1. **General Scope:** Provide a system of soil, waste and vent piping connecting all plumbing fixtures, equipment, etc. to the house sewer, with consolidated vent connections extending through the building roof, all as shown on the drawings and as required for complete installation. All piping must be concealed below grade, within walls, chases, above ceilings, etc., unless specifically noted otherwise. Waste and vent piping must be sloped in accordance with the applicable codes.

The Plumbing Contractor is responsible for and must consider pipe-grading requirements when coordinating pipe routing for the project. The contractor must determine inverts/connection points in the field based on the shop drawings of the sanitary system submitted. Coordination is required with the Civil Contractor before proceeding.

Do not begin work until the elevation of the final connection point is verified and grading of entire system can be determined (even if final connection is specified under another Section.)

Do not route the sewer line in the same trench as the domestic water line. Maintain a minimum of six (6) feet of separation between the two utilities.

Each pipe length and each pipe fitting, trap, fixture, material and device utilized in the plumbing system must bear the identification of the manufacturer and any markings required by the applicable referenced standards.

Rework existing waste roughing as required to facilitate renovation work as applicable.

3.2. **Utility Connection:** Connect to existing as indicated on the plumbing plans.

3.3. **Soil, Waste and Vent Piping Underground, Inside the Building Walls, Any**

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Equipment or Item Whose Discharge Into the Sanitary System is Greater than 125°F and to Points Outside the Building as Indicated: Provide service weight hub-and spigot cast iron soil pipe and fittings for underground service and hubless for above ground service, meeting ASTM A-74 for hub and spigot and ASTM A-888 for hubless, coated inside and out. The pipe exposed within the building must be uncoated outside, primed and left clean for painting. Fittings to receive screwed pipe arms must be recessed drainage type. Soil and waste pipe must have long sweeping connections. All cast iron soil pipe and fittings must be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and be listed by NSF International.

Joints for hubless pipe and fittings must be equivalent to MG couplings meeting ASTM A-48 and ASTM C-564, or Anaco Husky SD 4000, super-duty, shielded couplings of Type 304 AISI stainless steel, meeting ASTM C1540 and Factory Mutual 1680, Class 1 and vulcanized virgin compound in which the primary elastomer is neoprene conforming to ASTM C-564. Equivalent by Ideal Tridon Heavy Duty HD (Green) or Charlotte Pipe Heavy Duty HD (Green) are acceptable.

Option: Contractor may use solid wall PVC Schedule 40 DWV pipe and fittings meeting ASTM Standard D2665 and ASTM Standard D1785 for above ground service and underground service with the following exceptions. Use cast iron as specified hereinbefore or PVDF (Polyvinylidene Fluoride) piping and fittings in areas used as return air plenums, return air platforms, commercial dishwasher, commercial washer/extractors, steam kettles, any equipment or item whose discharge into the sanitary system is greater than 125°F and when passing through or within a fire rated assembly.

Piping and fittings above the floor must be solid wall PVC Schedule 40 DWV pipe and fittings, cast iron pipe and fittings as specified above or PVDF pipe and fittings as specified below, and with exceptions as noted.

THE USE OF "CELLCORE" OR "FOAMCORE" TYPE PIPING IS EXPRESSLY FORBIDDEN.

PVDF piping and fittings, where specified and required, must be Orion Super Blue PVDF (Polyvinylidene Fluoride) or equivalent products manufactured by Enfield, Zurn, GEO or Fisher. The PVDF material must conform to ASTM D3222 ASTM F1673, ASTM E-84 and UL 723. Pipe must be marked with its UL Classification to indicate compliance with UL723 (ASTM E84). All fittings must meet or exceed Schedule 40 dimensions.

All vents thru roof, regardless of type provided, must be cast iron pipe (minimum 10" both sides of the roof). Secure the cast iron VTR to structure with heavy gauge 1-hole strap. **THE CAST IRON PIPING THROUGH THE ROOF DOES NOT APPLY TO GAS FIRED APPLIANCES. Vents through the roof for gas appliances must be as specified for the appliance in its respective specification section.**

All floor drains must have cast iron deep seal p-traps with trap primer and

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required connections.

3.4. **Laying Out Work:** Vents from any fixture, when connected to a vent line serving other fixtures, must be extended at least 6 inches above flood level rim of highest of such fixtures to prevent use of vent lines as a waste. Make changes in direction by appropriate use of 45-degree Y's, 1/2 Y's, or long sweeping 1/4, 1/6, 1/8 or 1/16 bends. Sanitary T's or short 1/4 bends may be used on vertical stacks or drainage lines where change in direction of flow is from horizontal to vertical; except that long-radiused, double TY's must be used when two fixtures are installed back-to-back with common drain. Do not use double sanitary Tees. Straight Tees, Ells and Crosses may be used on vent lines. Make no change in direction of flow greater than 90 degrees. Where different sizes of drainage pipe or fittings are connected, use standard increasers and reducers of proper size. Do not reduce the size of drainage piping in direction of flow. Drilling and tapping of house drains, soil, waste or vent pipes, and use of saddle hubs and bands are prohibited. Route all vent lines high as possible while maintaining proper slope. All plumbing vents **through the roof, regardless of type provided, and EXCEPT FOR NATURAL GAS FIRED EQUIPMENT VENTS, must be cast iron and located a minimum of 10'-0" away from all outside air intakes**. Coordinate all plumbing vent locations with the HVAC plans prior to routing vent piping through the roof.

3.5. **Grading:** Uniform and not less than 1/8" PLF for pipe 3" and over, and not less than 1/4" PLF for piping less than 3".

3.6. **Hangers:** Refer to Section 15010 and plans for requirements.

3.7. **Roof Flashing:** Roof penetrations are to be flashed by the roofing contractor, using materials as recommended by the roofing manufacturer and approved by the Architect. Coordinate work with Roofing Contractor. Offset vents as required to clear gravel guards and flashing courses. Extend vents to 10" above roof level.

3.8. **Waste Arms:** Type K copper or IPS brass pipe typical. Alloy steel or IPS brass pipe at urinals.

3.9. **Escutcheons:** Where pipes pass through cabinets, walls and ceilings of finished rooms provide one-piece, cast-brass type with polished, chrome-plated finish and setscrew fastener or stainless steel type securely fastened in place. Pack penetrations with mineral wool insulation, seal with firestopping compound and install escutcheons to prevent passage of fire, smoke and vermin. Do not use split ring type escutcheons.

3.10. **Test Fittings:** Not shown on the drawings. Provide where required for partial tests.

PART 4. DRAINAGE SPECIALTIES

4.1. **Manufacturers:** Except as noted, catalog numbers are from J.R. Smith and/or Zurn. Equivalents by Josam, Sioux Chief or MIFAB will be considered.

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4.2. **Cleanouts:** Provide in sanitary piping at all changes in direction, at ends of branches, at intervals not exceeding 40 feet on straight runs, and elsewhere as shown. Cleanouts must be fully opening type and completely accessible without obstruction. Size same as lines in which they occur, but not larger than 4 inch. Tees and extensions must be of same weight as soil pipe. Plugs must be countersunk or raised head type with lead-free seals. Coordinate with plan details and specifications and provide as required. Provide flashing clamps and flashing flanges in all areas where cleanouts are accessible from floor below or above, as applicable.

Extreme care must be taken when roughing in cleanouts in each wall mounted lavatory and hand sink. Cleanouts must be located within the specified Lav Shield piping cover when possible. All cleanouts must be roughed in high enough to clear the Architectural base molding without cutting the base molding.

All cleanouts must be indicated on the record/as-built drawings.

In Tile Floors: J.R. Smith 4052L, Zurn Model ZN1400-T-BP, adjustable, cast iron body with bronze plug and satin finished square scoriated nickel bronze top. Where soft tile occurs, provide 4172L, Zurn ZN1400-TX-BP, recessed square nickel bronze cover.

In Concrete Floors: J.R. Smith 4238L, Zurn Model Z1400-BP, adjustable head, cast iron head and ferrule with bronze plug, round loose-set scoriated tractor cover.

In Accessible Unfinished Spaces: J.R. Smith 4400 or 4511-S, Zurn Model ZS1468, cast iron with bronze plug, as appropriate.

In Finished Walls: J.R. Smith 4530S, Zurn Model Z1446-BP cast iron cleanout tee with bronze plug and 16 ga., 304 stainless steel, flat, wall plate cover. Where distance from plug to finish wall exceeds 4 inches provide extension from sanitary tee to bring plug within 2 inches of the stainless steel cleanout cover. rough in all wall cleanouts such that stainless steel cover occurs above the Architectural base. Do not cut Architectural base.

In Terrazzo Floors: J.R. Smith 4192L, Zurn Model ZN1400-Z-BP, adjustable cast iron head and ferrule, bronze plug and round nickel bronze cover and rim.

In Carpeted Floors: J.R. Smith 4032L-X, Zurn Model ZN1400-CM-BP, adjustable head, cast iron, round polished bronze top with carpet clamping device.

4.3. **Typical Drains:** Size outlets same as pipe to which they connect. Install temporary closures during construction. **Each drain connected to sanitary sewer must have cast iron deep seal p-trap with trap primer and required connections.** Provide trap primer connections on floor drains and trap primers as specified below.

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Where drains occur above finished spaces, furnish with clamping collar to secure waterproof membrane.

Floor Drain (FD): J.R. Smith Series 2005B-05, Zurn Models ZN415-5S-P, J.R. Smith 2005B-06, ZN415-6S-P, J.R. Smith 2005B-08, ZN415-8S-P (as required) two-piece cast iron drains with gasketed outlet and adjustable nickel bronze strainer and rim. Strainer tops for 2" drains 5" x 5" (ZN415-5S-P), for 3" drains 6" x 6" (ZN415-6S-P), for 4" drains 8" x 8" (ZN415-8S-P). Provide PO5 trap primer connection as indicated on the plans.

PART 5. WATER PIPING

5.1. **General Scope:** Connect to water main as indicated and extend to all plumbing fixtures, trap primers, water heaters, etc.; and to HAC, kitchen, laboratory, laundry and special equipment or plumbing items as indicated or required.

Piping systems must be sloped to drain points. Drain points are not shown on the plans. They must be determined in the field based on the actual system installed. The Contractor must grade pipe upward from source to facilitate drainage and air relief. Where low points are required because of long runs or where sections may be valved off, provide with 3/4" globe valve and hose nipple for drainage at low point.

All piping must be concealed below grade, within walls, chases, above ceilings, etc., unless specifically noted otherwise.

Refer to Section 15010 for hanger rods, hangers, spacing, firestopping, sleeves, uni-strut support assembly, etc., requirements.

5.2. **General Workmanship:** Cut water piping accurately to measurements established at site and work into place without springing or forcing, clearing all openings, finished ceilings, etc.

All piping not in an accessible attic or similar spaces that contain valves and other items which may require maintenance or service access must be located no more than 12” above the finished ceiling. Piping located in attics must be supported such that maintenance access can be accomplished without the use of a ladder.

In finished spaces where water piping is exposed to view, route piping high as possible. Where valves or other items requiring service or maintenance are shown in piping of finished areas and exposed to view, the piping must be installed high as possible, except where a valve or other item requiring maintenance and service is shown in the line, the item must be no more than 14’-0” above the finish floor. Provide a drop, offset, etc., as required to maintain maximum service height of 14’-0” above the finished floor.

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Route all piping through previously built-in sleeves/firestopping assembly as specified in Section 15010. Avoid excessive cutting or other weakening of the building structure. Make changes in direction and size with fittings. Cap or plug open pipe ends during installation to keep out foreign material. Make connections carefully to ensure unrestricted flow, eliminate air pockets, and to permit complete drainage of the systems.

Supply piping to fixtures, faucets and flush valves must be anchored to prevent movement.

Install all buried piping with at least 36" of earth cover.

Uninsulated pipes passing through concrete or cinder block walls and floors, or other corrosive material must be protected against external corrosion by a protective sheathing or wrapping that will withstand any reaction from the lime and acid of concrete, cinder block or other corrosive material. Sheathing or wrapping must allow for movement including expansion and contraction of piping. The wall thickness of the sheathing material must be not less than 0.125 inch thickness. The protective wrapping/sheathing is not an alternative where sleeves are specified and required. Coordinate requirement with Section 15010 sleeves/firestopping specifications and provide as specified.

All piping below slab-on-grade construction must be installed in plastic jacket equivalent to Plasti-Sleeve, as manufactured by Plastic Products Co. of Stanton, California.

5.3. **Freeze Protection: Do not install piping or any device in spaces subject to freezing.** All water piping must be routed within the building insulation envelope unless specifically noted otherwise. Route all overhead water piping and water piping within masonry and non-masonry walls within the building insulation envelope.

All overhead piping must be located between the architectural air barrier at the bottom of the structure and the finished ceiling. Do not route overhead piping in the attic where it can be located between the architectural air barrier and the finished ceiling.

5.4. **Water Piping Insulation:** Refer to Part Pipe Insulation for requirements.

5.5. **Grading:** The Contractor must consider pipe-grading requirements when coordinating pipe routing for the project. All piping must be carefully installed to eliminate traps and pockets in pressurized lines. Where air pockets and traps cannot be avoided, provide valved hose connections for water traps and valved automatic air vents for air traps. The pipe slope must be maintained throughout the project.

Pressurized plumbing piping systems must be sloped to drain points. Drain points are not shown on the plans. They must be determined in the field based on the actual system installed. The Contractor must grade pipe upward from source to facilitate drainage and air relief. Where low points are required

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because of long runs or where sections may be valved off, provide with 3/4" globe valve and hose nipple for drainage at low point. **Make all connections to risers and fixtures from top or sides of mains. Do not make take-offs from bottom of mains.**

5.6. **Nipples:** Of same material as pipe in which they are installed. Provide extra strength when unthreaded portion is less than 1 inch long. Steel nipples are not allowed.

5.7. **Escutcheons:** Where pipes pass through cabinets, walls and ceilings of finished rooms provide one-piece, cast-brass type with polished, chrome-plated finish and setscrew fastener or stainless steel type securely fastened in place. Pack penetrations with mineral wool insulation, seal with firestopping compound and install escutcheons to prevent passage of fire, smoke and vermin. Do not use split ring type escutcheons.

5.8. **Piping and Fittings: ProPress or similar type joints and fittings are not allowed.** Typical lines to be of copper tubing meeting ASTM B-88, Type "L" hard above ground and Type "K" soft below ground. Cut copper pipe square and ream to remove burrs. Clean fitting socket and pipe ends with sand cloth, No. 00 cleaning pads or wire brush. No acids must be used to clean either pipe or fittings or as a flux in sweating joints. Make up joints with sweat fittings of wrought copper, and 0.25% of the total wetted surface area, lead free compliant solder complying with ASTM B-32 and the Safe Drinking Water Act. Surfaces must be prepared for soldering as required by ASTM B828. Do not make joints or branch connections below a slab on grade.

5.9. **Hangers:** Refer to Section 15010 and plan details for requirements.

5.10. **House Supply Connection:** Connect to existing as shown on the plans.

5.11. **Disinfection:** New potable water systems must be purged of deleterious matter and disinfected prior to utilization. The method to be followed must be as prescribed by the health authority or water purveyor having jurisdiction or, in the absence of a prescribed method, the procedure described in AWWA C651 or as described in this section below.

The potable water piping system must be flushed with clean, potable water until dirty water does not appear at the points of the outlet. The system or part thereof must be filled with a water/chlorine solution containing not less than 50 parts per million of chlorine, and the system or part thereof must be valved off and allowed to stand for 24 hours; or the system or part thereof must be filled with a water/chlorine solution containing not less than 200 parts per million of chlorine and allowed to stand for 3 hours. Following the required standing time, the system must be flushed with clean potable water until the chlorine is purged from the system.

Upon completion of the disinfection procedure, the Plumbing Contractor must engage the services of the Alabama Department of Public Health Clinical Laboratories or a certified, licensed, testing laboratory to provide a lead and

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bacteriological water analysis to include a standard heterotrophic plate count (HPC), microbial, bacterial, pathogens and coliform count.

Test a minimum of one (1) sample of domestic water from each bathroom being renovated. If individual toilets are finalized and turned over for the Owner's use and tested portion of the system is interrupted to plumb in remaining buildings, all water must be re-tested after each building release.

Test locations must be selected by the Architect and must be noted on the Testing Laboratory's report. Test each sample for Coliform Present, Fecal Present, E. Coli and lead present.

If the test results for any building or portion thereof indicates positive results for Total, Fecal, or E. Coli coliform per 100 ml respectively, or an HPC greater than 500 CFU/mL, or lead maximum contaminant level goal (MCLG) greater than zero, the Contractor must disinfect the system in its entirety, as specified above, and obtain new test results as outlined hereinbefore until levels are reached as required by AWWA C651. If maximum contaminant level goal (MCLG) of lead is greater than zero, immediately notify the Architect in writing and furnish copy of test results.

Prior to the final site visit, the Contractor must provide to the Architect the certified test results on the testing facility letterhead. The report must indicate the name of the project, the locations from where the samples were taken, the testing laboratory findings and written indication whether the water is safe for consumption. **No Certificate of Occupancy will be provided to the Owner without the required lab results indicating the potable water system is safe for consumption.**

5.12. **System Drainage:** Provide valves and hose nipple to allow for drainage of all risers and other system low points.

PART 6. WATER PIPING SPECIALTIES

6.1. **General:** All specialties in potable water distribution must be certified lead free compliant design as required by Code, Regulations and Standards.

6.2. All specialties in potable water distribution must be certified lead free compliant design as required by Code, Regulations and Standards.

All specialties/valves must be bronze or heat-treated DZR, CW511L brass, lead free compliant, AB 1953 compliant, NSF/ANSI 61 compliant and must be the product of one American Manufacturer and must meet the Buy American Act 41, USC 10a-10d as specified hereinbefore. Valves must have MSS SP-25, MSS SP-80 listings as applicable. Provide extended operators for all valves installed in insulated piping. Seal the opening where the stem, nipple, etc., penetrates the insulation as required to maintain the continuity of the insulation and vapor barrier.

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All valves must be identified. Provide a custom laser engraved brass valve tag at each valve. Tag must be 1-1/2 inches diameter, 18-gauge polished brass tags with 3/16-inch chain hole and 1/4 inch high stamped, black-filled service designation. Refer to Section 15010, Part Identification for detailed requirements and provide all as specified.

Valves must be Nibco, Jomar, Watts, Apollo, Kitz, Hammond/Milwaukee, Matco-Norca or Mueller. Nibco and Jomar units are the basis of design unless specified otherwise.

6.3. **Unions:** 150 psi rated; WOG pattern, cast brass ground-joint type in copper pipe. Unions in steel pipe must be malleable iron, WOG female pattern brass seat, ground joint, 150 psi type. Provide in all sizes of threaded pipe, and in sweat-jointed pipe over 1 inch, to facilitate easy repairs. In such lines, install at all inlets and outlets of all devices and equipment, adjacent to water heaters, pumps, tanks, etc. into which piping is terminated; and on each side of valves, cocks, strainers, etc. and other devices that occur in piping runs.

6.4. **Dielectric Unions:** Provide dielectric unions between ferrous and non-ferrous piping as required, including piping and water heater stubs where different, and stainless-steel water hammer arrestors. Dielectric unions must be constructed using lead free compliant materials as required by all Governmental Agencies, Codes and Standards and must comply with ASTM 1545. Dielectric unions must be Watts Series LF or equivalent by Mueller or Matco Norca. Where dielectric unions are installed, they must be provided with factory fabricated brass tag. 1-1/2 inches diameter, 18-gauge polished brass tags with 3/16-inch chain hole and 1/4 inch high stamped, black-filled service designation. Indicate valve tags on the record drawings. **Contractor must provide a ball valve on the respective piping containing the union as required to allow for proper maintenance of the union.**

6.5. **Valves and Valve Extensions:** Provide as specified, including all fixtures or equipment not furnished with stops. Arrange and install valves to be readily accessible for servicing. All valves must be bronze or heat-treated CW511L brass, lead free compliant, AB 1953 compliant and must be the product of one American Manufacturer and must meet the Buy American Act 41, USC 10a-10d as specified hereinbefore. Nibco and Jomar units are basis of design.

Coordinate valve handle height requirement with specified insulation thickness. Provide height extension as required to clear insulation and properly operate without causing damage to piping insulation. All handles must comply with UL 2043 and must be UL listed for installation in return air plenums. Valve extensions must be provided by the valve manufacturer and must have blowout-proof stems. Valve extensions must be Matco-Norca (for Matco-Norca valves) P759EXT, Nibco Series RG (for Nibco valves) or similar type extensions for the other specified valve manufacturers and constructed of all brass or stainless steel.

6.6. **Globe Valves 3" and Smaller:** Nibco T-235-LF, threaded, bronze type with replaceable disc, 150 WSP.

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6.7. **Check Valves 2" and Smaller:** Jomar T-511G, Nibco T-413-Y-LF or equivalent, MSS SP-80, ANSI B1.20.1, NSF/ANSI 61 and NSF/ANSI-372 compliant, all lead free bronze, threaded, Y-Pattern swing check, 300 WOG, Class 150 WSP.

6.8. **Ball Valves:** Valves must be Jomar T-200CSSG EH, Nibco T-585-66-LF, or equivalent, 600 CWP, 150 WSP, two-piece body, full port, blowout proof ASTM A276, Type 316 stainless steel stem and ball, reinforced PTFE seats and 2" minimum valve extension to bring valve handle beyond insulation. Valves must comply with NSF/ANSI 61/372-8, ANSI Z1157 and MSS SP-110/145 standards. Note that ball valves are also required on one side of each dielectric union.

6.9. **Thermometers:** Trerice Series BX, Model AX9, universally adjustable type with 7-inch scale and suitable temperature range, mercury free, 0°F to 160°F range as manufactured by Trerice. Thermometers must be "blue liquid" actuated with Phenol Condensate and lead-free cast aluminum case and brass stem and thermowell, with extension neck and other accessories required for a complete installation. Locate for convenient reading. Equivalent product by Blue Ribbon, Weksler, March or Maxwell Moore will be accepted.

6.10. **Water Hammer Arrestors (Shock Absorbers):** Certified by the American Society of Sanitary Engineers and in compliance with current edition of ASSE 1010, ANSI A112.26.1M, Plumbing and Drainage Institute Standard PDI-WH201, heavy-duty construction and designed for a minimum 150-PSI working pressure. Arrestors must consist of a Type 304 stainless steel casing and piston. The device must be pre-charged and sealed at the factory. Install on both hot and cold water branch lines in an upright position as close as possible to the valve or valves being served.

Arrestors must be installed at all solenoids, remote operated or quick closing valves and at each electric water cooler, each plumbing fixture or battery of plumbing fixtures. Type, location and size must be as recommended by the arrestor Manufacturer. Plumbing Contractor must provide a dielectric union at connection of this device to the copper water piping.

Arrestors must be Zurn Z1700, J.R. Smith Hydrotrol Series 5005-5050, Watts Series SS, Sioux Chief Series 660-G2B or MIFAB Series WHB.

6.11. **Automatic Trap Primer Units Where Water Closets Occur:** Trap primers must comply with the International Plumbing Code and local codes and must be served from the water closet flush valve tube assembly as shown on the plans. Provide trap primer line from flush tube to each floor drain, hub drain, etc. as shown, specified or required by Code. Water saver type trap primers that attach to lavatory p-traps or any other type of assemblies that use grey water are not allowed.

Trap primers must be Sloan VBF-72-A1, Zurn P6000-TPO or equivalent.

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PART 7. NATURAL GAS DISTRIBUTION SYSTEM

7.1. **General Scope:** Make house supply connection as indicated and extend to all gas fired equipment as well as other locations shown. Refer to Section 15010, Part Identification and this Part for identification of gas piping and painting. Refer to Section 15010 for support requirements.

7.2. **Utility Connection:** Arrange with the local Gas Company for service, with meter and regulator to be located as shown on the plans. Meter and all piping upstream of meter/regulator by Gas Company. Verify gas company pressure available at the site and provide meter/regulator assembly as required. Pay for all costs in connection with the installation. Provide main cut-off valve and a dielectric insulating union in service lines to building.

7.3. **General Installation:** Any damaged gas piping, fittings, etc., must be replaced. Installation must be in accordance with the local gas code, requirements of the local utility company, AGA, International Fuel Gas Code and NFPA Standard 54. Brazed or welded joints and fittings must be provided as specified. **Flare joint/fittings and press type joint/fittings systems are forbidden and must not be used.**

Cut the pipe accurately to measurements established at site and work into place without springing or forcing. Avoid running through solid walls or floors. Route through previously built in sleeves/firestopping assembly and avoid excessive cutting or other weakening of the structure. Ream all pipes to remove burrs. Make changes in direction and size with fittings. **Make take-offs from top or sides of mains, not from bottoms**. Cap or plug open pipe ends during installation to keep out foreign material. Lay out and grade work (1/4” in 15 feet min.) to avoid trapped lines, where unavoidable provide 4-inch drip leg with removable cap at low point. Provide complete system testing per NFPA 54. Provide combination stop valve and insulating union at each point piping drops to underground or rises above grade from underground.

Gas piping must enter and exit the installation at a point above grade. The annular space between the pipe and the wall must be sealed air and water tight. When passing through an outside wall, the piping must also be protected against corrosion by coating or wrapping with an inert material. Seal penetrations using steel or cast-iron 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. Select type and number of sealing elements required for the pipe material and size. Position pipe in the center of the sleeve. Assemble mechanical sleeve seals and
install them in an annular space between pipe and sleeve. Tighten bolts against the pressure plates that cause sealing elements to expand and make watertight seal.

Piping installed outdoors must be elevated not less than 4 inches above the ground. Where installed across roof surfaces, piping must be elevated not less than 4 inches, nor higher than required to allow for future re-roofing of the facility. Coordinate required height to allow for future reroofing with the current roofer

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before installing piping.

Piping installed above ground, outdoors, and installed across the surface of roofs must be securely supported and located where it will be protected from physical damage. Refer to Section 15010 and below, as applicable, for roof supports. All roof mounted gas supports must be as required by the roofing contractor.

Where gas piping is located within a framing member and is less than 2 inches from the framing member face to which wall, ceiling or floor membranes will be attached, the piping must be protected by shield plates that cover the full width and length of the piping. Where the piping is located outside of a framing member and is located less than 2 inches from the nearest edge of the face of the framing member to which the membrane will be attached, the piping must be protected by shield plates that cover the full width and length of the piping. Shield plates must be of steel material having a thickness of not less than 0.0575 inch (16 gage).

All gas pipe, tubing and fittings must be clear and free from cutting burrs, defects in structure or threading. Piping must be thoroughly brushed, and chip and scale blown. Defects in pipe, tubing, and fittings must not be repaired. Defective pipe, tubing, and fittings must be replaced.

Metallic pipe and fitting threads must be taper pipe threads and must comply with ANSI/ASME B1.20.1, Pipe Threads, General Purpose, Inch. Pipe with threads that are stripped, chipped, corroded, or otherwise damaged must not be used. Where a weld opens during the operation of cutting or threading, that portion of the pipe must not be used.

Provide unions and hangers same as specified under Water Piping Specialties except AGA rated for natural gas. Refer to Section 15010 and plan details for pipe hangers, supports, assemblies, rods and uni-strut requirements.

7.4. **Interior and Above Grade Piping, Including Piping on the Roof or in Crawl Space:** ASTM A53/A53M, Type as required by welding method, Grade B, seamless or ERW, Schedule 40 black steel pipe with ASME B16.3, Class 150 black malleable iron screwed fittings for 2” and smaller. Gas piping 2-1/2” and larger must be ANSI B16.25/ASME B16.9 butt-weld. Welders must be American Welding Society (AWS) certified. **Welders must submit a current AWS certificate** and must affix his/her AWS Certificate number and identification adjacent to each weld made.

7.5. **Electrical Bonding and Grounding for Pipe and Tubing Other than CSST:** Each above ground portion of a gas piping system other than corrugated stainless steel tubing (CSST) must be electrically continuous and bonded to an effective ground fault current path. Provide bonding in strict accordance with NFPA 70, Section 250. Bonding of gas piping systems is electrical work and must be provided by a qualified licensed Electrical Contractor who is recognized by the Authority Having Jurisdiction as capable of doing such work. Points of connection must comply with the current edition of NFPA 70, the National Electric Code. **It is the responsibility of the Plumbing Contractor to engage a qualified, licensed Electrical Contractor to provide the**

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bonding and grounding as specified. Allow as required and provide as specified.

7.6. **Lines Installed Under Slab or In Any Unventilated Areas or Spaces:** Gas piping must not penetrate building foundation walls at any point below grade. Gas piping must enter and exit a building at a point above grade. The annular space between the pipe and the wall must be sealed air and water tight. Gas piping installed concealed in walls, chases, below slab on grade, or any unventilated area or spaces must be installed in welded Schedule 40 steel piping with air tight joints and vented to the outside atmosphere through the roof. Suitable internal spacers must be provided. Inaccessible piping must be all-welded connections. Socket type weld fittings may be used for gas piping within the steel enclosure. Termination point of vented steel piping must be 24" above the roof with a gooseneck and must be located a minimum of 10'-0" clear from all outside air intakes.

7.7. **Gas Piping Within Schedule 40 Steel Vent Piping:** Gas piping system must be metallically shielded, arc resistant jacket, corrugated flexible gas piping system with valves, fittings, terminations and all components required for the installation, all furnished by the manufacturer. Using components from other flexible gas piping systems other than those specified as part of the FlashShield+ system is not allowed. The system must comply with ANSI LC 1/CSA 6.26 "Fuel Gas Piping Systems Using CSST". It must have CSA Certificate 2728525, ICC-ES Report No. PMG and IAMPO Report No. 3250 and Report No. 0239 listings. It must be rated for a maximum of 25 psi operating range, -40°F to 160°F temperature range, UV resistant, electrically insulated polymer covering complying with ASTM E84 and ASTM A240 Type 304 stainless steel corrugated tubing. Where the conduit originates and terminates within the same building, the conduit must originate and terminate in an accessible portion of the building and must not be sealed. The conduit must extend not less than 2 inches beyond the point where the pipe emerges from the floor. The manufacturer must be GasTite FlashShield+ or equivalent to JM Eagle or Dura-Line. GasTite is the basis of design.

7.8. **Lines Installed Below Grade:** Thermoplastic (Polyethylene - PE) PE pipe and heat fusion fittings conforming to ASTM D2513, SDR 11 and manufactured for 125 psig working pressure. Piping must be manufactured using the highest-grade materials available. All materials must have physical and mechanical properties as classified in accordance with ASTM D3350, have a cell classification of 234373E and APWA/ULCC Color Code Standards. Materials must be listed with Plastics Pipe Institute (PPI) as PE 2708 medium density Polyethylene (MDPE) and manufactured in accordance with all applicable specifications including ASTM D2513, The Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings, and by reference, must meet the Department of Transportation Title 49, Part 192 "Transportation of Natural and Other Gas by Pipe Line Minimum Safety Standards". The installation must be in strict accordance with CFR 49 Part 192, the Manufacturer's instructions and all applicable federal, state and local Codes and Regulations. **Minimum burial depth must be 36". Any piping installed less than 36" below finish grade must be installed in a containment**

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conduit and vented at exterior wall. Vent must terminate at a minimum distance of 36" above the building eave height.

Piping must be marked from the piping Manufacturer as "Gas" and "ASTM D 2513". **Piping without the marking is not allowed and will be rejected if found on site.** Pipe and fittings must have heat fusion joints. PE pipe and fitting materials for heat fusion must be compatible to ensure uniform melting and a proper bond. Each heat fusion pipe, except for electrofusion joints, must comply with ASTM F2620-12. Socket fusion fittings must conform to ASTM D2683. Butt fusion fittings must conform to ASTM D3261, molded and matching pipe dimensions. All piping must be in accordance with the Pipeline and Hazardous Materials Safety Administration (PHMSA)/DOT Plastic Pipe Rule issued on November 20, 2018. **When submitting piping for approval, compliance must be specifically noted on the cover sheet of the submittal, or it will be rejected without further review.**

Piping must be JM Eagle UAC 2000 MDPE, Performance Pipe Driscoplex 6500 or Dura-Line Poly Tough 1 with socket fusion connections.

Polyethylene ball valves must conform to ASME B16.40 and be manufactured and rated for underground gas service and operating pressure to 125 psig. The valves must be maintenance and corrosion free. Polyethylene valves must be full port opening type. All valves must be wrench operated. The wrench operated valves must have a 2-inch square adaptor securely fastened to the valve stem. Polyethylene valves must be installed by butt fusion method. All mechanical fittings must be Category 1 (joint w/ axial tensile strength at least equal to that of the pipe).

Risers must be Manufacturer's standard anodeless type riser, transition from plastic to steel pipe with fusion bonded epoxy coating. Factory assembled anodeless risers must be designed and tested in accordance with ASTM F1973-13. Inlet connection socket, butt weld or swaged gas-tight construction with O-ring seals, metal insert, and protective sleeve. Outlet or above ground connection end must be threaded or flanged. Riser must comply with ASTM A53/A53M, Type F and E, Grade A, Schedule 40 piping as required for gas piping specified herein before. Factory-assembled anodeless risers must be selected by the Manufacturer for the gas used and must be leak tested by the Manufacturer in accordance with the appropriate written procedures. Service head adapters and field-assembled anodeless risers incorporating service head adapters must be selected by the Manufacturer for the gas used and must be design-certified to meet the requirements of ASTM D 2513, Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings, and 49 CFR 192.281. Connections made outdoors and underground between metallic and plastic *piping* must be made only with transition fittings conforming to ASTM D2513 Category I or ASTM F1973.

Provide each valve on buried piping with a cast iron valve box of a size suitable for the valve. The valve box must have a round cover with the word "Gas" cast on it. A custom laser engraved brass valve tag must be installed on top and inside of each valve box lid. Tag must be 1-1/2 inches in diameter, 18-gauge polished brass and permanently attached. The tag must designate the appropriate valve number, valve size, and gas pressure. Include on the valve chart specified hereinbefore.

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Provide adjustable box extensions of length required for depth of buried valve to finished grade. Top of valve handle finished elevation must be a maximum of 12 inches below grade.

After installation of the piping, all must be tested in accordance with local gas company requirements as well as any State, Local and Federal requirements.

Tracer wire must be installed adjacent to the piping for the entire length of the underground piping system. Tracer wire must be a 12 AWG solid, PRO-TRACE HDD-CCS PE45. The conductor must be hard-drawn, 21% IACS, copper-clad steel, utilizing an AISI 1055 high carbon steel core with minimum break load of 1,330 lbs. or 260,000 psi (required to meet break load). Conductor must be extruded with a 45 mil, high density, high molecular weight polyethylene (HMW-HDPE) pursuant to ASTM D1248. Tracer wire must be rated for direct burial use at 30 volts and RoHS compliant. Tracer wire must be PRO-TRACE HDD-CCS PE45 as manufactured by Pro-Line Safety Products or equivalent by Seton or Stranco.

During the closing of the piping trench, all underground piping must also be identified with detectable direct burial marking tape. The marking tape must bear the printed identification of piping below it and reading, “Caution Buried Gas Piping Below.” Tape must be minimum 6” wide and minimum 5.0 mil overall thickness. The tape must be a 0.80 mil clear virgin polypropylene film, reverse printed and laminated to a 0.35 solid aluminum foil core and then laminated to a 3.75 mil clear virgin polyethylene film. Tape must be printed with APWA color coding, diagonally striped and large, bold, black lettering. **Tape must be buried 6” to 8” below finished grade and continuous over all underground gas piping**. For trenches over 8’-0” wide, provide an additional continuous length of detectable printed tape. Tape must be Pro-Line Safety Products or equivalent by Seton or Stranco.

7.9. **Electrical Bonding and Grounding of Corrugated Stainless Steel or Thermoplastic (Polyethylene - PE) PE Pipe and Heat Fusion Fittings:** Gas piping must not be used as a grounding conductor or electrode. The gas piping system and gas piping systems containing one or more segments of piping must be bonded to the electrical service grounding electrode system or, where provided, lightning protection grounding electrode system, all as required by NFPA 54. The bonding connection can be placed on any metallic fitting in the piping system as long as the bonding jumper does not exceed 75 feet in length. Where the length of pipe exceeds 75 feet in length, provide an additional grounding assembly as required by the local gas company and NFPA 54. The bonding jumper must not be smaller than 4 AWG copper wire with listed clamps. Clamps should be installed to remain accessible when building construction is complete. Devices used for the bonding connection must be listed for the application in accordance with ANSI/UL 467, Grounding and Bonding Equipment. Where a lightning protection system is installed, the bonding of the gas piping must be in accordance with NFPA 780, Standard for the Installation of Lightning Protection Systems. Bonding of gas piping systems is electrical work and must be provided by a qualified licensed Electrical Contractor who is recognized by the Authority Having Jurisdiction as capable of doing such work. Points of connection must comply with the current edition

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of NFPA 70, the National Electric Code. **It is the responsibility of the Plumbing Contractor to engage a qualified, licensed Electrical Contractor to provide the bonding and grounding as specified**. **Coordinate prior to bid and provide as specified.**

7.10. **Gas Valve and Connections:** For gas piping 2" and below, provide a 2-piece, full port, threaded connection ball valve, 600 WOG, FM Approval, UL Listed, CSA certified for use in natural gas systems, ANSI Z21.15 (.5 psig), CGA 3.16 (125 psig), ASME B16.33 (125 PSIG) rated, ANSI B1.20.1 and MSS SP-110 compliant. It must have triple sealing stem with two FKM O-Rings and PTFE G300 seat and packing, C38500 brass packing gland and steel, Geomet® plated handle and handle nut.

The Valve must be Jomar Series T-100NE or equivalent by Flowserve/Nordstrom or Homestead will be accepted. Jomar is the basis of design.

For gas piping 2-1/2" through 6", provide a 2-piece, full port, flanged connection, Class 150 manual stainless steel valve with dielectric protection gas valve. Valve must have wrench operator, fire safe stem and body graphite seals air tested seat leakage to 85 PSI, hydraulic tested body to 427 PSI, UL Listed YRBX flammable liquid or YSDT for LP gas, CSA Certified for natural gas, ASME B16.38 (125 PSIG), conforming to ANSI B16.34, ANSI B16.5 flange, ANSI B16.10 face to face and API 607 Fire Safe. Valve body, body cap and ball must be constructed of CF8M stainless steel, 15% RPTFE seat, 316 stainless steel stem, PTFE/Graphite body seal and packing gland, PTFE stem seal and gland bushing, CF8 stainless steel gland flange, 304 stainless steel, stop plate, gland bolt, handle washer, handle bolt, spring, tag and set screw, WCB carbon steel handle and 301 stainless steel snap ring.

Valve must be Jomar FL-SS-100-150 or equivalent by Flowserve/Nordstrom or Homestead will be accepted. Jomar is the basis of design.

Where final connection is specified under another Section, cap off within 3 feet of input point.

Provide a custom laser engraved brass valve tag at each valve identifying gas pressure and pipe contents. Tag must be 1-1/2 inches diameter, 18-gauge polished brass tags with 3/16-inch chain hole and 1/4 inch high stamped, black-filled service designation.

7.11. **Gas Pressure Regulators:** Provide a regulator at each gas fired appliance/device. Standard service type gas regulators for indoor or outdoor use as applicable, meeting project and Local Gas Company requirements with automatic safety shut-off valves, overpressure protection device (OPD) as required, leak/vent limiting device, cast iron body, with automatic safety shut-off valves, aluminum orifice and chromate covered casting, e-coated or primed with enamel topcoat and tamper proof seals.

Line gas pressure regulators must be listed as complying with ANSI Z21.80/CSA 6.22. All regulators provided on systems with inlet pressure greater than 2 psi must

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be provided with over pressure device (OPD). Regulators installed on the exterior of the building must be approved for outdoor installation. Verify supply (inlet) pressure prior to selecting regulators.

ALL gas pressure regulators with OPD must be vented directly outdoors. Gas vent piping must not be smaller than the vent connection on the pressure-regulating device. Do not reduce the size of the vent pipe size from the regulator. Vent piping serving relief vents and combination relief and breather vents must be run independently to the outdoors and must serve only a single device vent. Do not manifold vents together. Regulator vent piping must not exceed the length specified in the regulator manufacturer's instructions.

Vent material must be Type K or Type L copper tubing and comply with ASTM B88 or ASTM B280, as applicable. Vent termination must be on the outside wall of the facility and a minimum of four (4) feet distance from any window, door, louver, gas appliance vent and any source of heat or ignition. The vent termination device must be designed to prevent the entry of insects, water and foreign objects. It must be weather resistant with stainless steel body and screen, insulating unions and other accessories required for a complete and functional installation. Assembly must be equal to IMAC Systems Inc., threaded 90-degree angle vent or approved equivalent.

Provide a custom laser engraved brass valve tag at each regulator identifying gas pressure and pipe contents. Tag must be 1-1/2 inches diameter, 18-gauge polished brass tags with 3/16-inch chain hole and 1/4 inch high stamped, black-filled service designation.

The Contractor must provide to the Engineer a letter from the local gas company attesting to the maximum pressure drift to the facility downstream of the local gas company's meter/regulator assembly. If the local gas company states that pressure will exceed 2 psi on **any** occasion, for **any** period of time, the regulator furnished at each appliance within the facility must be Maxitrol Series 325-5L with OPD or equivalent by Sensus, Emerson/Fisher, Security or American as required by job conditions.

Failure to provide the required letter from the local gas company will be cause for immediate rejection of the submittal.

7.12. **Shutoff Valve:** Main gas shutoff valve controlling the gas piping system must be as specified above, rated for outdoor use as required, easily accessible for operation and must be installed in each service line as indicated or required and protected from physical damage.

Provide a custom laser engraved brass valve tag identifying gas pressure main on house side of the meter. Tag must be 1-1/2 inches diameter, 18-gauge polished brass tags with 3/16-inch chain hole and 1/4 inch high stamped, black-filled service designation.

7.13. **Gas Pipe Painting and Identification:** Gas piping identification must be provided as specified in Section 15010, Part Identification, except intervals

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must be a maximum of 12 feet for straight runs of piping.

All exterior and interior gas piping, fittings, etc., must be clean and rust free when installed. All exterior and interior gas piping exposed to view in finished and unfinished areas must be painted. Gas piping and fittings concealed above the ceiling or in partitions are not required to be painted unless rusted. Where any piping or fittings are rusted, all rust must be removed from the piping and then pre-treated with acidic etching primer specifically manufactured for the piping installed. **Apply two coats of the base and finish** rustproof enamel paint. Rusted portions of gas piping, fittings, etc., in attic and other concealed areas must be painted black after prepping for paint.

Color for piping in all mechanical rooms and similar locations where the piping is exposed must comply with IBC/IPC/IMC requirements and ANSI Standard A13.1, current edition. After gas piping is painted, identify with pipe markers as specified hereinbefore.

PART 8. PIPE HANGERS AND SUPPORTS

8.1. **General:** Refer to Section 15010, plan details and Pipe Insulation below.

1.1. **Coatings and Finishes:** Pipe hangers, Unistrut pipe supports and duct Unistrut support assemblies of galvanized, zinc and similarly coated items are considered to **NOT** be coated. All must be painted, powder coated, epoxy coated or plastic coated. Hanger rods and associated bolts, and clamps on Unistrut assemblies are not required to be painted or coated.

All damaged or rusted steel pipe, all uncoated cast iron pipe, and all hangers, Unistrut and other support assemblies, must be cleaned, primed and painted with two coats of compatible black enamel paint as specified below. Any rusted items must have the rust removed, then etched and primed for painting as recommended by the respective manufacturer. After prepping the surfaces, then paint with two coats of compatible black, rustproof enamel paint. Do not use spray paint.

All paint and coatings must have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. See specification section, Part "Identification" for detailed requirements.

In lieu of painted surfaces as specified hereinbefore, the Contractor may provide factory fabricated hangers and Unistrut assemblies with rust resistant powder coating, epoxy coating or plastic coating. All paints/coatings/finishes must meet or exceed a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84.

PART 9. PIPE INSULATION

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9.1. **General: The Plumbing Contractor must not install the piping insulation.** All piping insulation work must be provided by a licensed, experienced insulation subcontractor whose primary business is the sale and installation of insulation materials in accordance with insulation manufacturers' recommendations and these specifications. **The Insulation Contractor must provide a complete insulation submittal on his company letterhead detailing materials and methods as specified. The plumbing submittal will be automatically rejected and not be reviewed without a submittal from the specified Insulation Contractor.**

Where a conflict exists between these specifications and the Manufacturer's recommendations, the strictest installation must be provided.

Piping must be clean, dry and pressure tested before covering is applied. Size pipe hangers to fit insulated pipe size. **No installation of pipe hangers for insulated piping will be allowed to be in contact with piping or penetrate the piping insulation. Piping insulation must be continuous through partitions sleeve/firestop assembly and must not be cut away for installation of clamps, valves, fittings, etc.** Refer to details on plans, Section 15010, "Pipe Hangers and Supports", plan details and below for additional requirements.

Insulate all hot and cold water piping except that below grade and excluding plated brass fixture connections. All piping must be routed within the building insulation envelope to prevent freezing. Insulate all p-traps and related piping located in return air plenums, return air platforms, all horizontal overhead drain lines, including p-traps and drain sumps from mechanical room floor drains, ice machine drains, cooler drains, condensate drainage piping, hub drains and other condensate receiving drains, as specified below.

Fiberglass piping insulation Manufacturers must be Owens-Corning SSL II or equivalent by Johns Manville or Knauf. Owens-Corning is the basis of design.

9.2. **Installation of Fiberglass Insulation:** No installation of pipe hangers for insulated piping will be allowed to be in contact with piping or penetrate the piping insulation. Refer to details on plans for additional requirements. Size hanger loops to fit **over** insulation. Insulate with Owens-Corning SSL II with ASJ Max Fiberglass pipe insulation, thickness as shown below, thermal conductivity of k= 0.23 Btu-in/hr-ft2-ºF at 75ºF mean temperature. Insulation must comply with ASTM C547, ASTM C585, ASTM C1136, ASTM C795, NFPA 90A and 90B and be UL Labeled for Flame Spread Index of 25 or less and Smoke Developed Index of 50.

Adhere SSL by removing release paper after the insulation is installed on pipe and sealing the lap starting in the center of each section, working towards ends. Lap must be pressurized by rubbing with a plastic sealing tool. Install 5" butt strips in the same manner at the joint between sections and at 5'-0" on center. Staple jacket flaps and premolded PVC fittings with nominal 3/4" wide stainless steel or Monel outward-clinching insulation staples on 12" centers. PVC covers must be stapled on both sides of the fitting. Insulation staples must have a

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retarder coating or covered with 4" width 3M Venture Tape Film Faced ASJ Facing Tape, Series 106FXP adhesive tape or vapor barrier mastic that conceals the entire staple. Thereafter, neatly seal the entire jacket flap with vapor retarding sealant. Neatly bevel and seal all insulation at all unions to allow for the proper operation of the union without damaging the insulation.

Sealant must be water based, LEED, UL 723 (ASTM E84), ASTM C731/C732 Standard Test Method for Extrudability, ASTM E96 Water Vapor Permeance and ASTM D5590 Antifungal. The sealant must be Foster 32-19, Childers CP-35 or Vimasco 714.

Insulate all fittings and elbows with premolded fiberglass fittings containing 3lb. density **rigid** polyisocyanurate pipe insulation of equal thickness as the adjacent piping with PVC covering and UL Labeled for Flame Spread Index of 25 or less and Smoke Developed Index of 50.

In lieu of premolded PVC covers at elbows and fittings, which contain rigid polyisocyanurate pipe insulation as specified hereinbefore, Contractor may, at his option, miter the fiberglass insulation.

Cold Water/Domestic Water Insulation Thickness

All pipe sizes 1" thickness

Hot Water/Domestic Hot Water Insulation Thickness

For pipe sizes up to 1-1/4" – 1.0" thickness
For pipe sizes 1-1/2" to 6" – 1.5" thickness

9.3. **Insulation for Piping Within Concrete Block Walls:** Insulate with 1" or 1.5" thickness insulation for the respective piping as specified above. Insulation must be black, flexible foamed, elastomeric, closed cell pipe insulation with a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. It must be GreenGuard certified tubular insulation with Microban antimicrobial protection. Insulation must have a 'k' factor of not more than 0.26 at 90°F mean temperature and a water vapor transmission rate of 0.05 perm-inches or less. Slip insulation onto pipe prior to installation. **Slit insulation and longitudinal cutting of the insulation is prohibited. Slip insulation onto pipe prior to erecting. Do not stretch or bend insulation at any turn, tee, etc.** Insulate sweat/brazed fittings with miter-cut pieces of insulation as recommended in AP Armaflex installation instructions or, provide factory fabricated, made to order prefabricated fittings for tees, elbows, unions, etc. the same size as on adjacent piping as manufactured by AP Armaflex, Aeroflex Aerofit, K-Flex K-Fit or Aerocell.

9.4. **Fiberglass Insulation Fittings:** Insulate with Fiberglas insulation mitered to fit snugly or with PVC covers with integral, 3lb. density **rigid** polyisocyanurate pipe insulation of the same thickness as the adjacent pipe insulation. After installing the insulation and PVC covers, staple, seal, etc. as specified above. Do install sealant over PVC covers. Install cover, staple, seal fitting to the pipe

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insulation with 3M Venture Tape Film Faced ASJ Facing Tape Series 106FXP and then neatly cover the tape joints with the specified sealant.

Sealant must be water based, LEED, UL 723 (ASTM E84), ASTM C731/C732 Standard Test Method for Extrudability, ASTM E96 Water Vapor Permeance and ASTM D5590 Antifungal. The sealant must be Foster 32-19, Childers CP-35 or Vimasco 714.

Loose insulation within premolded covers is not allowed. Insulation must be as specified above or mitered.

Premolded PVC covers must have a flame spread index of 0-25 and a smoke developed index of 0-50 when tested in accordance with ASTM E84.

9.5. **Exposed Ends:** Finish open ends of sectional covering by rounding off with cement, and sizing with fiberglass cloth jacket around the pipe and finish with Foster 30-36 mastic cement.

9.6. **Partitions and Floors:** Refer to Section 15010 Pipe Sleeves and Firestopping. In any case, insulation must extend through floors, partitions and walls and firestopped. Note that Section 15010, Firestopping, requires firestopping of all penetrations, regardless of rating. Refer to Section 15010, Firestopping, for specifics and additional requirements.

9.7. **Aluminum Jacket:** All new water piping insulation located in crawl space must be covered with a preformed, 18 ga., .04” thick, smooth finish, 3003 and 3105 series aluminum jacket conforming to ASTM B-209 standards. Fittings must be 18 ga., .04” thick, die shaped, and smooth finish, Type 1100 aluminum jacket meeting ASTM C585. Provide 1/2" wide, 18 ga., .04” thick , Type 3003 aluminum bands on maximum 24" centers but not less than two bands per jacket section. Locate longitudinal lap of aluminum jacket on bottom for all horizontal piping. Seal jacket lap and make watertight with silicone caulk any portion of the aluminum jacket exposed to exterior ambient conditions. The aluminum jacket must extend and terminate a minimum of 12” inside the respective indoor space. Seal the penetration and ends of piping insulation weather tight. **VentureClad or similar product is prohibited**.

9.8. **Electric Water Coolers:** Insulate drain connections and traps with 1/8" thick insulating tape by AP Armaflex, K-Flex or Aerocel AC EPDM or 1/2” thick fiberglass insulation as specified for piping insulation.

9.9. **Unistrut Support Saddle Requirements:** For all piping suspended with Unistrut assembly, provide a factory fabricated pre-formed, pre-insulated saddle assembly consisting of an **integral** hot dipped G-90, ASTM A653 compliant galvanized saddle per table below. **Do not use loose saddles.** The assembly must be a 360-degree section of 3.0 PCF density, 4.0 PCF density or 6.0 PCF density, non-compressive as appropriate for the manufacturer’s standard. For IPS 6" and above provide an additional load distribution plate of all point loaded Unistrut or trapeze hangers. The assembly must be ASTM D1621, ASTM C209, ASTM E96, ASTM D2856 compliant. The assembly must

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have a 6-mil thickness, industrial grade vapor retarder film in compliance with ASTM D-374 and 0.01 perm rating in compliance with ASTM E-96. The assembly must also be provided with an insulation lock joint longitudinal seam. The insulation jacket must have a hazard rating not to exceed 25 flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E-84, NFPA 255 and UL 723. Insulation thickness required must be same as specified above.

Installation must be in strict accordance with the Manufacturer's requirements. After installation, install **3" zero perm** butt strips at the joint between insulation sections where fiberglass insulation and the polyisocyanurate insulation butt together. Staple insulation jacket flaps and seal staples as specified above for fiberglass insulation.

Each assembly must have a genuine "Quick-Inspect" sticker applied at the bottom of each saddle for easy jobsite verification by the Engineer or Inspector. **Failure to provide the sticker on each assembly will be cause for immediate rejection of the installation.**

Refer to the plan details for additional requirements.

The assembly must be Buckaroos Model 3300E-LT or equivalent to Thermal Pipe Shields, Inc, Pipe Shields, Inc. Carpenter & Paterson, Inc., Clement Support Services or VEP/ASC Engineered Solutions. Buckaroos Model 3300E-LT is the basis of design.

Unistrut Saddle Requirements

Nominal Pipe Size	Insulation Length	Saddle Length	Saddle Gauge
1/2" - 3"	6"	4"	22 Ga.
3-1/2" - 4"	6"	4"	20 Ga.

9.10. **Clevis Hanger Saddle Requirements:** For a single pipe suspended with a single clevis hanger assembly, provide same insulated saddle assembly as specified above for the Unistrut assembly. Refer to the plan details for additional requirements.

9.11. **Painting:** Paint exposed insulation after insulation is completed as specified in Section 15010.

9.12. **Identification:** Refer to Section 15010, Part Identification for identification of piping systems.

PART 10. ELECTRIC WATER HEATING EQUIPMENT

10.1. **Water Heater:** Rheem Series EGSP, A.O. Smith Series DEL or equivalent by Bradford-White. Water heater(s) must be light duty, commercial, glass-lined tank with heating elements designed for current shown on the Electrical

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Drawings, copper dip tube, drain pan, storage capacity not less than indicated on the drawings and must meet new UEF ratings established by the U.S. Department of Energy.

The water heater must bear the UL or ETL label and be covered by a minimum 3-year manufacturer's tank warranty and 1-year parts and labor warranty from the date of substantial completion as determined by the Architect.

10.2. **Power Wiring:** Specified under Electrical Division. **Verify voltage and power requirements with Electrical Contractor and Electrical plans prior to ordering equipment.**

10.3. **Circulating Pump:** Furnish and install, as shown on the plans, an all lead-free bronze (0.25% or less lead content of all wetted surfaces) or stainless steel construction, stainless steel flanges, pipe-mounted centrifugal pump with high efficiency ECM motor with algorithm to automatically adjust speed, flow and operation based on the actual requirements of the system, to include maintaining flow rates below recommended practice for the piping installed. The pump must be ETL or UL listed and be NSF 372 compliant.

Provide a strap-on aquastat equal to Honeywell L606A for insertion into the immersion well and wire to control the pump through a 7-day program clock, which must be programmed to the Owner’s requested operating schedule. Clock must be equivalent to Tork EWZ-201C, Intermatic ET8215CR or Eaton ATC 2000 with NEMA 3 enclosure, automatic daylight savings time adjustment, automatic leap year compensation and minimum 4-day battery or super capacitor back-up power. Provide all required control wiring, power wiring and connections as required for proper operation as specified.

The pump for water heater in Janitor 16 must be Taco 0034ePlus, Armstrong Series Compass R, B&G Ecocirc XL or Grundfos Alpha HWR 15-55 SF/T. Taco 0034ePlus is the basis of design. Pump power must be as shown on the electrical plans.

The pump for water heater in Janitor 6A must be Taco 0026e-SF2, Armstrong Series Compass H or Grundfos Alpha HWR 15-29 SF/T. Taco 0026e-SF2 is the basis of design. Pump power must be as shown on the electrical plans.

10.4. **Relief Valve:** The relief valve must comply with ANSI Z21.22 and CSA/ASME rated temperature and pressure relief valve on the water heater with copper relief line piped as indicated on the plans. Temperature and pressure relief valves, or combinations thereof devices must bear the label of an approved agency and must have a temperature setting of not more than 210°F and a pressure setting not exceeding the tank or water heater manufacturer’s rated working pressure or 150 psi, whichever is less. The relieving capacity of each pressure relief valve and each temperature relief valve must equal or exceed the heat input to the water heater or storage tank. Do not pipe/connect relief discharge line and auxiliary drain pan lines together. The manufacturers must be Watts, Apollo or McDonnell and Miller.

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10.5. **Thermometers:** Trerice Series BX, Model AX9, universally adjustable type with 7-inch scale and suitable temperature range, mercury free, 0°F to 160°F range as manufactured by Trerice. Thermometers must be “blue liquid” actuated with Phenol Condensate and lead-free cast aluminum case and brass stem and thermowell, with extension neck and other accessories required for a complete installation. Locate for convenient reading. Equivalent product by Blue Ribbon, Weksler, March or Maxwell Moore will be accepted.

10.6. **Expansion Tank:** Provide diaphragm type with NSF liner, designed for 150 psig working pressure and must bear an ASME stamp. Tank must have minimum acceptance as recommended by the water heater manufacturer. Expansion tank must be supported at the wall by a HoldRite QS-U Quick Strap with 1/2" wide, 0.025” thick, 200/410 stainless steel bands and 16 Ga. galvanized steel bracket of required capacity and load rating for the expansion tank shown on the plans or approved equivalent.

10.7. **Auxiliary Drain Pan:** Provide 2” deep, 18 ga. (0.05” thickness) galvanized steel or 18 ga. (0.05”) thickness stainless steel auxiliary drain pans with seamless, welded or brazed watertight joints. Width of pan must provide minimum of 3” clearance between water heater and inside face of the pan. Provide 3/4” copper drain line in **bottom** of pan to floor drain with dielectric separation where water heater is elevated or placed on a stand. Do not pipe relief discharge line and auxiliary drain pan lines together. Auxiliary pan must be manufactured by Killarney Metals, an approved equivalent or a shop fabricated pan with construction specified above, and with welded or soldered joints. **Factory manufactured pans that do not meet the specified requirements above are not allowed.**

10.8. **Wall Mounted Water Heater Stand:** In lieu of the wall mounted assembly indicated on the plans, the Contractor may provide for water heaters up to 35 gallons of capacity, a factory fabricated unit with watertight pan constructed of 18 ga. galvanized metal and integral metal 1-1/4” auxiliary drain, 16 ga. galvanized C-brackets, 12 ga. galvanized 45 degree brackets with low carbon steel, zinc plated, threaded rods as required for a 750 lb. load with 2x safety factor. Provide minimum of 1” Rubatex insulation over all edges of the stand to protect individuals from injury should they hit the stand. Cap auxiliary drain connection provided with the specified stand and provide drain in the bottom of the pan. Provide dielectric fitting between galvanized drain outlet and copper auxiliary drain line specified.

The assembly must be QuickStand 60W-SWHP-WM steel, wall mounted equipment platform manufactured by HoldRite or approved equivalent. Note that where this assembly is provided, the auxiliary drain pan specified above is not required. In all circumstances, the 1” thick, heat resistant neoprene pad under the respective heater is required. Stand and installation of stand must be as recommended by the Manufacturer for a 750 lb. load regardless of water heater volume.

10.9. **Inspections:** The Plumbing Contractor must arrange and pay for the State of Alabama Boiler and Pressure Vessel Safety Division/Inspection Divisions,

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Elevators/Boilers Inspector to visit job site to inspect water heater and/or boiler installation and obtain written approval, certification and Certificate for Potable Water Heater (PWH) as required. Correct all deficiencies required by the Inspector without additional cost to the Owner or the Owner's Project Design Professionals, using materials and methods, as directed by, State of Alabama Boiler and Pressure Vessel Safety Division/Inspection Divisions and Elevators/Boilers inspector as required.

PART 11. COMPRESSED AIR SYSTEM

11.1. **General:** The air compressor complete with operating and safety controls will be furnished by the Owner. This Contractor must receive the unit at the site, set unit isolation pads, on concrete pad. Final connections to air compressors by the Owner.

11.2. **Pipe:** Schedule 80 galvanized steel pipe with galvanized malleable iron threaded fittings. Lay out to have minimum of trapped lines; provide drain cock at low points where traps are unavoidable. All branch lines to take off from top of mains. Provide unions and hangers as specified for water piping. All valves must be globe type rated at 300-psi air pressure.

11.3. **Regulators and Outlets:** Furnish for certain air stations indicated on plans air so that pressure may be adjusted at each individual station without affecting the pressure at the remaining stations. Regulators must be of the relieving type for protection against over-pressure. The regulator must have 1/2-inch fittings, Black E coated aluminum body, glass filled nylon bonnet, Buna N elastomer seals, brass seat, 1/4" full flow gauge ports and with 0 to 250 psi gauge. The regulator must be an Arrow R-354G or equivalent. Air outlets must be "quick coupling type".

11.4. **Isolators:** Provide minimum 3/4" thick neoprene pad isolators and anchor to 6" concrete housekeeping pad with rounded corners.

11.5. **Pipe Hangers and Supports:** Refer to Section 15010 and plan details for additional requirements.

11.6. **Inspections:** The Plumbing Contractor must arrange and pay for the State of Alabama Boiler and Pressure Vessel Safety Division/Inspection Divisions, Elevators/Boilers Inspector to visit job site to inspect Owner's air compressor installation and obtain written approval, certification and Certificate for the air compressor as required. Correct all deficiencies required by the Inspector without additional cost to the Owner or the Owner's Project Design Professionals, using materials and methods, as directed by, State of Alabama Boiler and Pressure Vessel Safety Division/Inspection Divisions and Elevators/Boilers inspector as required.

PART 12. AIR HOSE REELS AND RELATED ITEMS

12.1. **General:** Contractor must provide all items required for a complete, working and first class installation. Provide all required valves, adapters, hanging

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brackets, unions, stops, etc. as required.

12.2. **Air:** Air Reels must be Alemite 8078 Series, Heavy-Duty Hose Reels with swivel and reel ball bearings for reduced torque load on power spring. Reel must have anti-lockout design whereby ratchet prevents lockup when hose is fully extended, eliminating the need for manual release of the pawl. Reel must have sealed bearings to prevent contamination, factory lubrication, and one piece power spring cassette. Reel must have a five-position guide arm to allow for hose to be released at an optimum position. Reel must be provided with Alemite 3/8" x thirty (30) ft. delivery hose rated at 300 psi, 1/4" NPTF connecting hose outlet and 3/8" NPTF delivery hose inlet. Air reels must be maroon in color.

12.3. **Miscellaneous:** Piping supports must be as specified in Section 15010. Provide dielectric separation for all dissimilar metals.

PART 13. FIXTURES SUPPORTS AND CONNECTIONS

13.1. **General:** Verify exact size and location of water, vents, waste and supply connections from approved rough-in drawings and/or catalog data sheets. Allow for modifications required by the shop drawings without additional cost to the Owner or the Owner's Project Design Professionals.

All fixtures including lavatories, urinals, water closets, electric water coolers, etc., must be securely fastened to the walls or floor. **Coordinate all mounting heights and fixture types required with Architectural plans prior to rough-in and ordering fixtures.**

Demolish and modify existing roof, walls, floors, partitions and ceilings as required to accomplish the required work. Remove existing carriers, existing water and waste, saw cut floors, walls, partitions, ceilings, etc., as shown and as required to install new piping or reconnecting to existing waste and water rough-in.

All penetrations of floors and partitions are required to be built-in as work progresses. All penetrations of new construction that were not built-in as required by these specifications, and all existing floors, walls and partitions must be core drilled or sawcut large enough to allow all conduits, piping, firestopping assemblies, etc., to continue uninterrupted, and to provide proper firestopping of the penetration as required to install new items as shown and/or specified.

Reconstruction and repair of the demolished/modified items must be as directed by the Architect. Coordinate demolition and repairing/rebuilding of items with General Contractor prior to bid to allow for installation of carriers, piping, etc., as applicable.

13.2. **Wall Mounted Fixtures:** Support all wall mounted fixtures that are specified without carriers using 1/4" thick 6" high plates full length and width of fixture, mounted behind wall. Where fixtures are back to back on a solid wall, mount

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with bolts from fixture hanger to fixture hanger. Do not use toggle bolts or expansion bolts unless noted on the plans or specified.

Where fixtures are mounted on solid (single wythe) walls finished both sides, install fixtures with plated toggle bolts.

Where fixtures are mounted on wood or light gauge steel studs, employ pressure treated blocking of 2” x 12” nominal size well secured into stud line with non-corrosive, dielectric separation fasteners. Fit behind stud flanges, using especially placed studs as required.

Demolish and modify all existing walls, partitions, ceilings and saw cut all floors as required to install new items as shown and/or specified. Reconstruction and repair of the demolished/modified items above must be as directed by the Architect. Coordinate demolition and repairing/rebuilding of items with General Contractor prior to bid to allow for installation of carriers, piping, etc., as applicable.

13.3. **Floor Connections:** Provide cast iron or galvanized malleable iron floor flanges at least 3/16" thick, screwed or caulked to drainage pipe. Bolt the connection and make tight to fixture with plumbing fixture setting compound, wax setting ring or polyethylene gasket flange. Offset flanges for water closets are not allowed.

13.4. **Water Supply Connections:** Provide rigid, lead-free brass nipple from water riser to fixture stop valve threaded connections. Steel pipe is unacceptable. Exposed portion of nipple must be chromium plated. Stops’ risers must be lead-free, threaded with chrome over copper pipe. Quick connect fittings and braided supplies are not allowed.

13.5. **Waste Arms to Fixtures:** As specified hereinbefore. Where copper or brass pipe is specified, all joints downstream from the trap must be brazed joints.

PART 14. SCHEDULED FIXTURES AND MISCELLANEOUS ITEMS

14.1. **Acceptable Manufacturers:** American Standard, Zurn, Elkay, Kohler and Toto catalogs.

Where three (3) Manufacturers are listed for fixtures below, use only those Manufacturers. Manufacturers not mentioned in the specifications require prior approval, seven (7) days prior to bid date. Follow procedures set forth in Division 1 of the specifications. Where substitutions are proposed, unless the Contractor states in writing, on a separate recap/summary sheet in front of the respective submittal, the differences of the substituted equipment or material, he must be responsible to replace such items any time discrepancies are found. All prior approvals must be submitted through the Architect.

Architect must select all colors where choices exists.

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14.2. **Fixture Trim:** Exposed metal parts to be of heavy weight polished brass, heavily chromium plated, of best quality as regularly furnished by the plumbing fixture manufacturer. Provide stop valve in supply to all fixtures and equipment.

14.3. **Compliance with Americans Disabilities Act:** All fixtures, faucets, flush valves, etc., specified or shown to be ADA type must be manufactured and installed in complete compliance with the current requirements of the Americans Disabilities Act and ICC A117.1 Standard for Accessible and Usable Buildings and Facilities

14.4. **Guarantee:** Guarantee in writing to make good without cost any defects in materials and workmanship for one (1) year. **ALL** flush valves and faucets must be provided with a five (5) year, full replacement warranty, including labor.

Warranty/guarantee must start on the date of substantial completion of the project as determined by the Architect. Provide free maintenance and service during the first 12 months of the guarantee period.

Scheduled Items:

P – 1 Tank Type Water Closet: American Standard white, elongated Cadet Pro, Right Height, Kohler Kingston, 1.28 GPF vitreous china, Cadet flushing system, Aquaguard lined tank with locking device, EverClean surface, fully glazed trapway, china bolt caps, chrome trip lever, McGuire #166 or equivalent by Brasscraft, Zurn or Nibco supply with stop, Bemis 1655SSCT white open-front seat with self-sustaining stainless steel check hinge and hardware with Sta-Tite locking system or equivalent by Zurn, Church or Beneke, Zurn Z5972-COMB closet bolt and wax ring kit, china bolt caps and all other items required for a complete and functional installation.

P – 2 Tank Type ADA Water Closet: American Standard white, elongated Cadet Pro, Right Height or Kohler Kingston, ADA compliant, 1.28 GPF vitreous china, Cadet flushing system, Aquaguard lined tank with locking device, EverClean surface, fully glazed trapway, china bolt caps, chrome trip lever, McGuire #166 or equivalent by Zurn, Brasscraft or Nibco supply with stop, Bemis 1655SSCT white open-front seat with self-sustaining stainless steel check hinge and hardware with Sta-Tite locking system or equivalent by Zurn, Church or Beneke, Zurn Z5972-COMB closet bolt and wax ring kit and all other items required for a complete and functional installation. Coordinate trip lever installation with grab bar. Trip lever handle must be mounted for use from the wide side of the toilet stall. Refer to Architectural plans for mounting heights. Fixtures designated by the Architect as ADA/handicapped must be mounted at current ADA requirements.

P – 3 ADA Lavatory: American Standard Lucerne 0355.012, Zurn Model Z5364, Kohler Kingston K-2005, 20” x 18” wall hung vitreous china lavatory complete with Zurn Z81000-XL-17M, single control, solid cast brass, polished chrome plated faucet, 1.5 GPM vandal resistant, pressure compensating aerator, McGuire #LF2167, Zurn Z8803-XL-LRLK-PC or equivalent by Brasscraft or Dearborn Brass offset drain, Nibco 1/2” supplies

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with full turn wheel handles and stops, McGuire #155WC, Zurn Z8746-PC, Brasscraft or Dearborn Brass offset drain, McGuire 8872, Brasscraft, Zurn or Dearborn Brass p-trap and heavy-duty floor supported JR Smith Series 0710, Z1231EZ chair carrier with concealed arms. Where lavatory manufacturer drain outlet complies with ADA requirements, offset drains are not required. Supplies must be lead-free, AB 1953 certified by recognized authority and bear manufacturer and testing mark. Refer to Architectural plans for mounting heights.

Provide lead-free mixing valve (ASSE 1070) with tempered water line to faucet. Mixing valve must be provided with wall bracket, dual check valves and 40-mesh stainless steel screen. Mixing valve must be Watts LFUSG-B-SC-M2, Leonard 170D-LF or Zurn-Wilkins ZW3870XLT. The entire assembly must comply with ADA and ANSI standards.

Provide for each fixture an ADA compliant, heavy-duty, impact-resistant, stain-resistant and chemical-resistant rigid vinyl vandal-resistant enclosure with vandal resistant fasteners that shields all piping, electronic faucet components (as applicable), mixing valves and instantaneous water heaters. If plans indicate an instantaneous water heater to be installed at the lavatory, the Contractor must contact the Lav Shield Manufacturer for guidance on the required installation. **Do not install Lav Shield until Engineer has inspected the piping installation.**

The Lav Shield must contain an antimicrobial additive that resists fungal and bacterial growth. The Lav Shield must comply with ASME A112.18.9-2001, ADA article 4.19.4 (606.5), ANSI A117.1, BOCA P 1203.4, and other required State and Local regulations. The Lav Shield must be provided in standard white finish for the exact fixture specified or custom color, fit to field Lav Shield in the color selected by the Architect. Furnish standard **and** custom color chart to Architect for selection. Lav Shield must be manufactured by Zurn Model Z6900-VG, Truebro/IPS corporation or approved equivalent.

P – 4 Service Sink: American Standard Lakewell 7692.008, Zurn Model Z5890, size 24” x 20” acid resisting enameled cast iron service sink with American Standard 8341.076, Zurn Z843L1-XL-CS or T&S Brass B-1958 chrome faucet with vacuum breaker, Brasscraft XR1720A supplies with stops, American Standard 7798.030, Zurn Z5900-IP3 trap standard, Zurn Z1229 rigid carrier system, stainless-steel rim guard, adjustable wall brace, pail hook, 3/4” hose thread on spout, four foot rubber hose, Bradley 9933 combination utility shelf/broom holder and utility shelf constructed of 18 ga. 304 stainless steel with 16 ga. stainless steel gussets and hooks.

P – 5 Bi-Level ADA Indoor Electric Water Cooler with Bottle Filler: Elkay # LZSTL8WSSP, bi-level, ADA cooler, refrigerated stainless steel high capacity lead reduction filtered, wall mounted, front and side bubbler push bar, electronic bottle filler sensor, ADA and ICC A117.1 compliant with cane apron, stainless steel cabinet and receptor, safety bubbler and 5-year warranty on refrigeration system. It must provide 8 gal/hr. of filtered water at 50°F based on 80ºF inlet water and 90ºF ambient temperature, per ASHRAE 18 testing. Unit

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must be certified to UL 399 and CAN/CSA C22.2 No. 120 and NSF/ANSI 42, 53, 61 & 372 for lead free compliant design. Unit must be provided with quick filter change wrapper providing easy access to filter from the front and side of cooler for efficient filter changes. Furnish with 1-1/4" McGuire, Dearborn Brass, Brasscraft or Zurn rough brass p-trap, 17-gauge brass tailpiece and waste with wheel stop valve, concealed Elkay MLP200 or equivalent by Zurn or J.R. Smith bi-level floor mounted support, related floor support plates and base as required for applicable wall construction. Refer to Architectural plans for wall type. Equivalent units by Halsey Taylor, Oasis or Murdock will be considered.

Provide three (3) extra stock 51600C Water Sentry Plus Replacement Filters for each set of coolers shown on the plans, 6,000-gallon filter tested and certified to NSF 42 and 53 under manufacturer's name to reduce lead, Class 1 particulates and chlorine taste and odor certified to NSF 42, NSF 53, NSF-401 and NSF 372 at greater than stated product flow rate for each bi-level water cooler provided. Upon completion of the project, turn over replacement filters to Architect for transfer to Owner.

P – 6 NOT USED

P - 7 Emergency Eye-Wash: Equivalent to Guardian #GBF1724, ADA compliant complete with four spray heads, stay open ball valve with flag handle, wall mounting bracket, backflow preventer and G6020 thermostatic mixing valve in G6023 powder coated steel recessed cabinet with temperature and pressure gauges on hot and cold water inlets to deliver tepid water. Equivalent units by Leonard, Haws, Acorn or Bradley will be acceptable.

P – 8 ADA Sink: Elkay LRAD 221955, 22" x 19" x 6" deep, single compartment 18 gauge stainless steel sink with self-rimming construction complete with one LKGT4083 ADA faucet with forward only lever handle, pull-down spray, deck plate and escutcheon, LKAD35 strainer and offset tail piece, Oatey 8912, McGuire, Dearborn Brass, Brasscraft or Zurn 1-1/2" p-trap 17 gauge continuous waste, Brasscraft XR1720A with full turn wheel handles and angle stops and all other items required for a complete installation. Sink must have drain at rear of the compartment as required to meet ADA regulations. Verify cabinet depth and slope with Architectural plans prior to ordering sink.

Provide lead-free mixing valve (ASSE 1070) with tempered water line to faucet. Mixing valve must be provided with wall bracket, dual check valves and 40-mesh stainless steel screen. Mixing valve must be Watts LFUSG-B-SC-M2, Leonard 170D-LF, Symmons 8210CK, Cash Acme or Zurn-Wilkins ZW3870XLT.

Insulate supplies, trap and drain with premolded ADA compliant protectors with internal fasteners as Manufactured by Truebro Lav Guard 2, Oatey/Dearborn or McGuire Pro-Wrap only.

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P – 9 Refrigerator Icemaker Water Connection Box: Guy Gray/IPS Corporation 82392 or 82396 as applicable. Unit must be NSF-372 compliant; IAMPO listed and accommodate supply line from above. Supply box must include a 1/4-turn, chrome plated, forged brass, lead-free, ASME A112.18.1 ball valve with stainless steel water hammer arrester and a top inlet water sweat fitting. Valve must accommodate all common industry inlet connections. Box must be 20 ga. stainless steel, fire rated frame if required, and outlet connection must be 1/2". Each unit must include a frame, and a debris cover for protection during rough-in. Equivalents by Sioux Chief, Oatey, SharkBite or LSP will be acceptable.

P – 10 Mop Basin: American Standard 7741.000 Florwell, Zurn Model Z5850-D3-RG-HH-MH-WG or Kohler K-6710-0 acid resisting enameled cast iron corner model floor type service sink, complete with American Standard 8354.112, Zurn Z843M1-XL or T&S Brass B-0665-CR-BSTRK wall mounted faucet with offset shanks and integral stops, levered vandal resistant handles, vacuum breaker, integral check valves, adjustable wall brace, pail hook, 3/4" hose thread on spout, four foot rubber hose, Bradley 9933 combination utility shelf/broom holder and utility shelf constructed of 18 ga. 304 stainless steel with 16 ga. stainless steel gussets and hooks, 7745.811 rim guard, strainer for 3" screw connection, 304 stainless steel wall guards and silicone sealant at all points where wall guard meets the basin, wall and floor.

END OF SECTION

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SECTION 15700

HEATING, VENTILATING AND AIR CONDITIONING

PART 1. GENERAL

1.1. **General Provisions:** Section 15010 is applicable in full hereto. No materials or products that contain asbestos, formaldehyde, polychlorinated biphenyl (PCB), lead or mercury, in excess of limits mandated and defined by OSHA, LEED and the EPA, must be utilized.

Do not fabricate any duct or install any pipe or equipment until all coordination has been accomplished. Refer to Section 15010 for coordination requirements.

Manufacturers not mentioned in the specifications require prior approval, seven (7) days prior to bid date. Follow procedures set forth in Division 1 of the specifications. All prior approvals must be submitted through the Architect.

1.2. **Qualifications:** The Mechanical Contractor and the required third party external duct Insulation Contractor must be properly licensed and established at the location of the work and must maintain locally adequate service facilities. They must have had previous experience in the satisfactory installation of at least six (6) systems of this type, size, complexity and scope. Each Contractor must have an adequate service facility to provide complete service and maintenance of the facility within 100 miles of the installation.

1.3. **General Scope:** Include all equipment, material, and labor required for complete and proper installation and operation of mechanical systems, even though not every item involved is indicated. Do not attach any items to other trades' assemblies. Items must be separately attached to the building structural system.

The Mechanical Contractor must not install the external duct insulation. All external duct insulation work must be provided by an independent third party licensed and experienced Insulation Subcontractor whose primary business is the sale and installation of insulation materials in accordance with insulation manufacturers' requirements and these specifications. Refer to Part Duct Insulation Work (External) for detailed requirements.

Advisory provisions listed in all Codes referenced in the Contract Documents are mandatory. Where conflicts occur between a Code, Standard, the contract drawings or specifications, the most stringent requirements must govern and be applied.

Manufacturers not mentioned in the specifications require prior approval, seven (7) days prior to bid date. Follow procedures set forth in Division 1 of the specifications. All prior approvals must be submitted through the Architect. Where substitutions are proposed, unless the Contractor states in writing, on a separate recap/summary sheet in front of the respective submittal, the differences of the substituted equipment or material, he must be responsible to replace such items any time discrepancies are found.

Where units of the same class of equipment are required or specified, these units must be products of a single manufacturer, however, the component parts of each unit need not be. All major equipment must be provided by the same manufacturer

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throughout the project. No mix matching of equipment Manufacturers is allowed unless specified otherwise.

Architect must select all colors where a choice exists.

1.4. **Record Documents:** Provide in such detail, as is set forth under General and Supplemental Conditions and in Section 15010.

1.5. **Access Panels and Doors in Finished Areas:** Do not locate serviceable items above inaccessible, hard ceilings or in partitions without written approval from the Architect. Coordinate all items locations with the Architectural plans before installing any items. Furnish access panels and doors to the General Contractor for installation wherever required for access to any items requiring maintenance.

Access panels/doors in finished areas or areas exposed to view must be suitable for wall or ceiling finish involved, 24" x 24" unless otherwise indicated or as required to permit removal of equipment and provide acceptable maintenance access. Access panels and doors must be fire rated where rated assemblies are penetrated.

Access panels and doors must be manufactured by Milcor, Elmdor, Zurn, Mifab or approved equivalent. The Architect must approve the use of, and type of, all panels and doors to be installed in areas that are exposed to view or in finished areas.

Exposed access panels and doors must be factory cleaned and primed for painting in the field. Colors, materials and methods must be as directed by the Architect. Refer to Architectural Section, Painting, for additional information.

For detention and similar institutional type facilities, refer to Section 1122 for type of access panels/doors required.

Refer to Section 15010, Part Access Panels and Doors for additional requirements.

1.6. **Access Panels/Doors for Miscellaneous Areas:** Refer to Section 15010 and above for access doors required for equipment, valves, etc. in exposed/finished locations.

Provide double wall access door in the side of the duct for each fire damper, motorized damper, on each side of duct mounted coils and duct heaters, smoke detectors and elsewhere indicated, specified or required for proper maintenance. Size and position to provide maximum access to all items with minimum 12”x12”.

Typical doors must be double metal faced, 22 ga. steel door panels and 22 ga. frame, internally insulated same as duct (1” minimum) fiberglass insulation, neoprene gasket seal and full length plated steel piano hinges with cam lock. Provide access panels/doors with cam locks only, where hinged access panels/doors cannot be completely opened without obstruction. When access panels/doors are provided with cam locks only, they must be provided with a safety chain. Access panels/doors must be rated for the anticipated duct pressure, plus 1”. All access doors located outside must be airtight and weatherproof.

Hinged access doors must be Ruskin Series ADH22. Removable access doors/panels with cam locks must be Ruskin Series ADC22 with minimum of two cam locks and safety chain. Nailor Industries Model 08SCL/Model 08SH, Kees ADH/ADC, Greenheck HAD or Pottorff Series HAD/CAD will be acceptable.

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For ducts 10” round and smaller, access doors must be flush mounted, flat oval, 1” insulated, low leakage, 20 ga. steel door panels and frame, except with two large hand knobs or cam locks with safety chain, and equivalent to Ruskin Model ADR1 for round ducts or equivalent by Nailor, Greenheck, Kees or Pottorff.

Hinged access doors for round ductwork over 10” must be flush mounted, flat oval, 1” insulated, low leakage, 20 ga. steel door panels and frame, except with two large hand knobs or cam locks with safety chain, and equivalent to Ruskin Model ADR2 for round ducts 12” round up to and including 16” round duct. Nailor Series 0800, Pottorff Series DMR, Greenheck RAD or equivalent by Kees will be acceptable.

1.7. Refer to Section 15010 for additional access door/panel requirements including Section 15010, Part Identification for identification requirements.

1.8. **Boiler Permits and Inspections:** The Mechanical Contractor must arrange and pay for the State of Alabama Boiler and Pressure Vessel Safety Division/Inspection Divisions, Elevators/Boilers Inspector to visit job site to inspect water heater and/or boiler installation and obtain written approval, certification and Certificate for Potable Water Heater (PWH) as required. Correct all deficiencies required by the Inspector without additional cost to the Owner or the Owner’s Project Design Professionals, using materials and methods, as directed by, State of Alabama Boiler and Pressure Vessel Safety Division/Inspection Divisions and Elevators/Boilers inspector as required.

1.9. **Buy American:** The Manufacturers of all Section 15700 items must be in complete compliance with the Buy American Act and the American Recovery and Reinvestment Act of 2009. Exceptions will be allowed where certain items are not available. Ex., VRF equipment. Where three (3) U.S. Manufacturers can meet the requirements of these specifications, their products must be provided. During the submittal phase of the project, the respective Manufacturer must provide a conformance letter from an Officer of the Manufacturer’s Board of Directors, on company letterhead, which indicates compliance with the aforementioned Acts. Failure to provide the compliance letter at the submittal stage must be cause for immediate rejection of the submittal.

1.10. **Site Visits:** It is the contractor’s responsibility to have the job ready for site visits when they are scheduled. If the project is not ready for the requested site visit and the Architect, any governmental agency or any other entity requires an additional site visit with the Engineer present, the contractor must pay Zgouvas, Eiring & Associates a re-visit fee of $2,000. The payment must be made directly to Zgouvas, Eiring & Associates 5 days prior to the scheduled site visit.

The Contractor is urged to carefully review the extensive requirements of Paragraph Identification and Refrigerant Piping Identification in Section 15010 of the specifications. Note that certain identification is required to be completed before certain site visits. **There are specific identification requirements prior to the above ceiling and final site visits, respectively, that are mandatory. The State of Alabama Department of Construction Management (DCM) will cancel on-site, the site visit if not completed as specified. Failure to comply with this provision will be cause for cancellation of the site visit, and a fee imposed for the additional site visit, with all costs of the additional site visit to be borne by the Contractor.**

1.11. **Miscellaneous:** Bidders must visit the site and become acquainted with all job conditions that may affect the work shown on the plans. Report to the Architect, prior to bid, any new or existing conditions that require modifications to accomplish the

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installation of all items. Provide for required adjustments to complete the intent of the work. No consideration will be given after bid opening for alleged misunderstanding regarding new or existing job conditions, utility connections, permits, fees, construction documents, etc.

The Contractor must carefully examine the contract documents during the bidding phase. Any missing information, clarifications, etc. in the contract documents that is required to obtain accurate pricing must be brought to the attention of the Architect, **prior to bid date**, so all may be clarified and/or corrected. Failure to identify and resolve any issue prior to bid must require the Contractor to provide said items, complete, without additional cost to the Owner or the Owner's Project Design Professionals, using materials and methods specified by, and as directed by, the Owner's Design Professionals.

Refer to Section 15010 for additional requirements.

1.12. **Identification: Custom factory fabricated refrigerant piping labels are required. Stick-on, painted, stenciled or hand written identification is not allowed.** The Contractor is urged to carefully review the extensive requirements of Part Identification in Section 15010 of the specifications and note that certain identification is required to be completed before certain site visits**.** There are specific identification requirements prior to the above ceiling and final site visits, respectively, that are mandatory. **The State of Alabama Department of Construction Management (DCM) will cancel on-site, the site visit if not completed as specified. Failure to comply with this provision must be the cause for cancellation of the site visit, and a fee imposed for the additional site visit, with all costs of the additional site visit to be borne by the Contractor**.

1.13. **Painting and Colors:** Furnish to the Architect, color cards for standard and premium colors available. **The Architect must select color where choices exist**. Refer to the Architectural Painting Section of the specifications for additional requirements.

1.14. **Coatings and Finishes:** Pipe hangers, Unistrut pipe supports and duct Unistrut support assemblies of galvanized, zinc and similarly coated items are considered to **NOT** be coated. All must be painted, powder coated, epoxy coated or plastic coated. Hanger rods and associated bolts, and clamps on Unistrut assemblies are not required to be painted or coated.

All damaged or rusted steel pipe and all hangers, Unistrut and other support assemblies must be cleaned, primed and painted with two coats of compatible black enamel paint as specified below. Any rusted items must have the rust removed, then etched and primed for painting as recommended by the respective manufacturer. After prepping the surfaces, then paint with two coats of compatible black, rustproof enamel paint. Do not use spray paint.

All paint and coatings must have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. See specification Section 15010, Part Identification for detailed requirements.

In lieu of painted surfaces as specified hereinbefore, the Contractor may provide factory fabricated hangers and Unistrut assemblies with rust resistant powder coating, epoxy coating or plastic coating. All paints/coatings/finishes must meet or exceed a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. Refer to Section 15010 for additional requirements.

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1.15. **Safety Provisions:** Provide covers or guards on all hot, moving and projecting items that may be deemed by the Engineer, Architect or Owner to be a hazard to occupants of the building or to service personnel. Provide full size expanded metal grilles over all exhaust/relief air assemblies on all packaged equipment to protect against any intrusion to motorized dampers, gravity backdraft dampers, etc.

1.16. **Spare Parts:** Manufacturer of any equipment specified must have a wholesale outlet for readily available replacement parts in the nearest major USA city.

1.17. **Submittals:** Refer to Section 15010 for **strict requirements** and, especially as it applies to format, project cost constraints, addendums and Value Engineering (VE) items.

Only ONE complete submittal will be accepted. Providing submittals piecemeal is not allowed. If a partial or incomplete submittal is provided, it must be cause for immediate rejection.

1.18. **Firestopping:** Refer to Section 15010, Part "Partial Work to be Coordinated With Other Trades", Paragraph "Firestopping". **Note that Division 15 firestopping specifications require firestopping of all penetrations regardless of wall/ceiling/floor construction. Refer to Division 1 regarding additional requirements.** Where there is a conflict between Division 1 specifications and Division 15 specifications, the most stringent requirements must govern, be applicable and must be provided.

1.19. **Service, Charges, Lubrication, Filters, etc.**: Furnish complete first charges of refrigerant, lubrication, oils, etc., and be responsible for such full charges for the guarantee period. Provide service and maintenance for all equipment and systems during the guarantee period. As a minimum, quarterly service calls and reports are required. Make the last service call two weeks prior to the year-end site visit. All quarterly service must include lubrication of all motors, bearings, calibration and adjustment of all controls and equipment, full refrigerant charge, new filters, belts, etc.

The Contractor is responsible for quarterly filter changes of all disposable filters, and cleaning of all washable filters, during the guarantee period. The Contractor must inscribe onto the disposable filters' casing the date filters were installed/replaced.

The Contractor must furnish to the Architect and the Owner individual written service reports for all work done under this warranty. Failure to provide the Architect with the Owner's written acknowledgement of service calls must be construed to mean that the service calls have not been accomplished and are still required.

1.20. **Field Instructions:** The Contractor must operate all systems for a period of six (6) days after completion of the work. During this time, provide competent personnel to thoroughly instruct representatives of the Owner in the proper operation and care of all equipment and control systems, to include the installation of the air conditioning equipment maintenance tool on the personnel's mobile devices. Example: For Trane equipment, install the Symbio Maintenance App.

Secure written acknowledgement of such training and the installation of the Maintenance App from the Owner. Failure to provide the Architect with the Owner's

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written acknowledgement of this training must be construed to mean that the instructions have not been accomplished and are still required.

1.21. **Operating and Maintenance Manuals: Two weeks before the final site visit**, furnish three complete sets of operating and maintenance instructions, bound in hard cover, indexed and tabbed.

The Contractor must also provide this information in digital Adobe Acrobat PDF format, on a CD-R CD. The PDF file must be provided with an embedded index for each specified item. The index must appear in the left hand window of the opened document so that the Owner or his maintenance personnel can "click" on the indexed item and move immediately to that specific item.

Minimum requirements for the Operating and Maintenance Manuals must be as follows:

a. The first page of the bound instructions must be a listing of:

    1. The Owner/Project Title.
    2. The Architect and Architect's Job Number.
    3. The Engineer and Engineer's Job Number (Found in the Engineer's Logo in the Bottom Right Corner of the Mechanical Plans).
    4. The General Contractor and Contact Information.
    5. The Mechanical Subcontractor and Contact Information.
    6. HVAC Controls Subcontractor and Contact Information.

b. Second page must be a Table of Contents listing all products in the order which appear in the specifications and label the tab accordingly. Include all equipment using nomenclature shown on the Mechanical plans, UV-C lights, and similar devices, control valves, motorized dampers, fire dampers, etc.
c. The third page must be a summary page that lists each item with its respective warranty, including all extended warranties.
d. All warranty card information must be filled in by the Mechanical Contractor; Serial numbers, Model Numbers, etc. all as required for proper warranty registration. The warranty registration date must be the date of substantial completion as determined by the Architect.
e. Provide copies of all filled in warranty cards.
f. Provide a local source of supply for parts and replacement, including names and telephone numbers of parts suppliers.
g. Provide a general maintenance summary section. Section must be a list of each piece of equipment or device using the designations as shown on the plans, and the routine maintenance procedures based on the respective manufacturer's recommended intervals. As a minimum, maintenance must be grouped and individually tabbed to indicate maintenance operations required:

    1. Once a month
    2. Quarterly
    3. Once every six months
    4. Once a year

h. Provide copy of the results of all specified tests.
i. Copy of Test and Balance Report.
j. Copies of all the Mechanical Engineer's Site Visit Reports including Contractor's written response that items listed were corrected.

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k. Copies of all certificates of all site visits, comments and approvals from all Governing Authorities, to include all Boiler and Pressure Vessel inspections by the Authority Having Jurisdiction, as applicable.
l. Copy of the Contractor's letter to the Authority Having Jurisdiction for all air conditioning systems containing greater than 55 pounds of refrigerant.
m. Provide copy of all the specified start-up reports.
n. Copies of equipment Manufacturers' certified factory test results of the equipment testing before shipping.
o. Provide copy of hoods certification, as applicable.
p. Provide DVDs of Section 15920 HVAC Controls systems training of Owner's personnel.
q. Final Commissioning report
r. Provide a copy of the valve chart required in Section 15010, Part Identification. Include all dielectric unions, cleanouts and valve numbers on chart. Valves' numbers must also be indicated on the record drawings.
s. Provide copy of all Division 15 Specifications except Section 15400.
t. Provide a copy of all shop drawings/submittals.
u. Provide drawings of system control and wiring diagrams, condensed operating instructions, specified sequences of operation. Include hard copy in binder and digital copy on CD in PDF format. All components must be numbered and identified on the diagram. Laminate, frame under plastic and mount in each mechanical room in an optimally viewed location.
v. Provide record drawings of the Mechanical drawings, in hard copy and PDF format on CD. Refer to Section 15010, Part 1, General, Paragraph, Record Drawings for detailed requirements. Record drawings must also indicate all valve numbers from the specified valve chart.

1.22. **Warranty:** Guarantee work as set forth in Section 15010 and Division 1. Guarantee in writing to make good without cost any defects in materials and workmanship for one year following the date of substantial completion of the project, as determined by the Architect, and unless specified otherwise a 5-year warranty on all air conditioning compressors. Provide free maintenance and service during the guarantee period to **include furnishing and replacing of filters, and the cleaning of all washable filters.** Refer to other parts for additional requirements and extended warranty requirements.

PART 2. ELECTRICAL WORK AND EQUIPMENT

2.1. **Power:** All power wiring required for installation of equipment is specified under the Electrical Division. Electrical equipment must be compatible with the electrical power shown on electrical drawings. **The contractor must verify all voltage and power requirements with the Electrical Contractor, Electrical plans, and at the project site, prior to ordering equipment.**

2.2. **Motors:** All furnished motors must be designed, manufactured, and tested in accordance with the current applicable standards of NEMA, ANSI, IEEE, and ASTM. As a minimum requirement, all motors must conform to the current applicable sections of NEMA Standard No. MG-1, Part 3. Motors must meet or exceed The Consortium for Energy Efficiency (CEE) Premium Efficiency™ full load efficiencies. All motors 1 HP and over must be premium efficiency. All motors with scheduled capacity of less than 1 HP must be ECM type as required by ASHRAE 90.1 and with minimum motor efficiency of 70% when rated in accordance with DOE 10 CFR 431. Premium efficient motors must be **warranted for 36 months** from the date of substantial completion of the project as determined by the Architect.

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All motors must be listed under the UL recognized component file as applicable. All motors must be suitable for installation according to the requirements of NEC. Motors must be wound for the specified voltage and a 1.5 service factor, 1750 RPM open drip proof construction and minimum of Class “F” insulation unless otherwise shown or specified.

The bearings must have a rated fatigue life of B-10 of 150,000 hours for direct-coupled applications and 50,000 hours for belted applications minimum. Belted rating must be based on radial loads and pulley sizes called out in NEMA MG 1. Load on motors must not exceed 100% nominal horsepower. Routine factory testing must be conducted in accordance with Method B of IEEE 112 (current edition), Standard Test Procedure for Polyphase Induction Motors and Generators and must be as described in Article 12.55 of NEMA MG1, Motors and Generators.

Where shown, specified or required, furnish increment wound motors for two-step starting. All motors must be provided with overload protection and phase protection on all legs. Do not run motors until correct overload elements are installed in starters. Trading overload elements for elements of correct size for motors actually furnished must be included in this Section.

All motors serving outdoor equipment exposed to weather must have TEFC motors meeting the requirements set forth previously.

Motors must be manufactured by Regal Rexnord Corporation, Emerson Electric, Franklin Electric, AMETEK, Inc, Baldor Electric Company/ABB, Nidec Corporation, Siemens AG or ABB Group.

2.3. **Variable Frequency/Speed Drives:** Drives must be mounted on wall at accessible height standing from floor. Equipment mounted or Uni-strut type frame mounting is not acceptable. All drives must be provided with an integral disconnect switch. Where shown or required to be a part of a new or existing HVAC Controls System (BAS), variable frequency drives must be equipped with integral disconnect switch and a serial interface to allow bidirectional communication with the existing or new BAS. At a minimum, the following points must be made available to the controls system: Set Point, Drive Speed (RPM), Frequency (Hz), Current (A), Power (KW), Energy (KWH), Last Fault Number, OK/Faulted Status, Stop/Run Status, and Hand/Off/Auto Status. Drives must be installed in accordance with NEC requirements for electrical panels.

Drives must be provided with NEMA 1 enclosures for standard indoor service, NEMA 12 enclosures for dusty/dirty indoor environments and NEMA 3R enclosures for outdoor or wet environments. Air filters must be provided for air intake openings only on NEMA 3R and 12 enclosures. Drives must be installed in accordance with NEC requirements for electrical panels. Drives must be ABB Model ACH550 or approved equivalent by Danfoss, Allen-Bradley, Eaton, Toshiba or Yaskawa. ABB is the Basis of Design. Refer to Part Automatic Controls at end of 15700 or Section 15920, Heating, Ventilating and Air Conditioning Building Automation System (BAS), as applicable, for additional requirements.

Variable Frequency/Speed Drives must be manufactured by Danfoss A/S, ABB Group, Siemens AG, Schneider Electric, Rockwell Automation, Yaskawa Electric Corporation, Emerson Electric, Fuji Electric, Invertek Drives Ltd or Eaton Corporation.

2.4. **Fusing:** Provide factory installed fuses in all equipment requiring fusing for branch circuit protection.

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2.5. **Motor Starters as Required:** To be furnished under this Section; installation thereof is specified under the Electrical Division, except for those which are specified to be factory assembled. Starters must be U.L. and NEMA approved. Where required for interlocks provide built-in step down transformer. Motors for VFD drives must be designed for NEMA MG-1, Part 30.

Motor starters must be mounted on wall at accessible height standing from floor. Equipment mounted or Uni-strut type frame mounting is not acceptable.

Provide for each motor or group of motors requiring a single control (and not controlled from a motor-control center), a suitable controller and devices that must function as specified for the respective motors.

Provide overload protection for each ungrounded conductor to each motor 1/8 HP or larger (manual reset type unless indicated otherwise). The overload-protection device must be integral with the motor or controller. Unless indicated otherwise, furnish pilot lights with all remote starters. Where auxiliary control devices are connected into control circuit, these devices must not bypass safety controls (motor-overload protective devices, high-pressure cutouts, low pressure cutouts, etc.). Provide "Hand - Off - Auto" switches, auxiliary contacts, etc. for all starters.

Motor starters must be manufactured by Siemens AG, Schneider Electric, ABB Group, Rockwell Automation, Eaton Corporation, Danfoss A/S, Yaskawa Electric Corporation, Emerson Electric, Fuji Electric or GE Vernova.

2.6. **Unit Protection:** All fan motors, indoor units, outdoor units, condensing units, packaged units, etc., must be provided with equipment manufacturer, factory installed surge protection and phase protection to ensure against voltage unbalance, over/under voltage loss, phase loss, reversal, incorrect sequencing and rapid short cycling. When not available from the equipment manufacturer, protection must be provided for all 3-phase equipment utilizing ICM Controls Model 450 A Plus+ or equivalent. All single phase equipment with horsepower greater than or equal to 1/8 HP must be provided with protection utilizing ICM Controls Model ICM 492 or equivalent. The Contractor must consult with the Owner's maintenance personnel and set up all programmable options based on the Owner's requirements, within the device's capabilities. Phase protection is not required on equipment being controlled via a variable speed frequency drive; if the specified protection is inherent with the variable speed drive furnished.

2.7. **Controls:** All HVAC controls cabling and wiring must be in EMT conduit (no “whips”) or on J-hooks. Above accessible lay-in ceilings, control wiring must be installed on J-Hook assemblies. Above all hard, inaccessible ceilings, in all mechanical rooms and in areas with exposed structure (no ceilings), controls wiring must be in conduit. Do not attach any wiring, cabling or conduits to refrigerant piping.

Do not route control wiring through sleeves containing piping. Do not route any control wiring through or within any ductwork. **All wiring penetrating any exterior wall, interior partition, floor, and similar construction must be in conduit with protective grommets on the conduit ends. HVAC outdoor control wiring must terminate above the ceiling in an accessible location. Through base control wiring/conduit is not allowed.**

EMT control conduit must be as specified in the Electrical Division of the specifications and/or as shown on electrical drawings. Minimum HVAC Controls

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conduit size must be 3/4" in size. All control conduit, power, relays, contactors, transformers, wiring, etc., required for a complete functional system as specified, shown on the plans, or as required to accomplish the specified sequences of operation, which is not shown or specified by the Electrical Division, must be furnished and installed by the HVAC Controls Contractor. This must include all power, interlock control wiring between the various components of the heating, ventilating and air conditioning system, lighting interlocks and all smoke detection system electrical wiring.

Electrical work performed under this Section must conform to requirements set forth in the Electrical Division(s) of the specifications. All wiring must be in accordance with the National Electrical Code, and all State and local codes. Coordinate all requirements with the Electrical Sub-Contractor prior to bid and provide all as required.

All thermostat and humidistat boxes must be mounted 46" A.F.F. to the center of the box (ADA height). Where wall mounted CO_2 Sensors are indicated, they must be mounted 58" A.F.F to the center of the box. All wall-mounted devices must be provided with hinged, locking metal covers with rounded edges.

Provide drawings of system control and wiring diagrams, condensed operating instructions and specified sequences of operation. Include hard copy in Operating and Maintenance Manuals binder and digital copy on CD in PDF format. All components must be numbered and identified on the diagram. Laminate, frame under plastic and mount in each mechanical room in an optimally viewed location.

All work must be done by an approved, independent HVAC Controls Contractor whose primary business is the installation and servicing of HVAC controls systems.

2.8. **Controls and Instrumentation Cable:** Instrumentation cable must be minimum AWG as recommended by the equipment Manufacturer or the HVAC controls system Manufacturer. The most stringent cable requirement must be provided. All wiring, cabling, conduit, connections, etc., must be plenum rated and rated for use at temperatures and conditions expected in the location of mounting. Do not attach any wiring, cabling or conduits to refrigerant piping.

2.9. **Wiring Diagrams:** Furnish to the Electrical Contractor for the specific makes and models of electric-motor operating equipment to be installed. **The contractor must verify all voltage and power requirements with the Electrical Contractor, Electrical plans, and at the project site, prior to ordering equipment.**

2.10. **Modifications:** The cost of any modifications of the electrical power wiring, breakers, and/or control wiring conduit, etc. that is required for any items specified in Section 15700, or controls having electrical power requirements differing from that shown on the electrical drawings and/or as specified, must be the responsibility of the Mechanical Contractor.

PART 3. PLUMBING WORK

3.1. **Floor Drains:** By Plumbing Contractor. HAC Contractor must provide drains from all air conditioning equipment drains, relief valves, air vents, etc. to the floor drains, hub drains, to outside as indicated on the plans or, in absence of the previous requirements, as directed by the Architect.

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PART 4. VIBRATION AND NOISE CONTROL

4.1. **General:** Elimination of objectionable vibration and noise is the responsibility of the Contractor, who must provide all foundations, spring isolators, flexible connections, air chambers, curbs, etc. required thereby. Pay special attention to vibration problems at year end site visit and correct all deficiencies noted.

All items of mechanical equipment including air handling equipment, water chiller, evaporative condenser, air cooled condensers, condensing units, pumps, piping, indoor cassette units and fans must be properly isolated from the structure by means of the Engineer's approved vibration absorbing accessories, foundations or supports. Each foundation must include an adequate number of standard isolation units. Install floor mounted pumps and air handling units on minimum of 6" thickness, 5,000-psi concrete pads, inertia bases or base rails as shown on the plans or as specified. Final concrete requirements must be as directed by the Structural Engineer. Foundations for each piece of equipment must be submitted for review.

Isolator units must, as a minimum, consist of machine and floor or suspension fastenings, with intermediate steel spring isolation material, and must be standard catalog products with printed loading rating. Manufacturer must be TR Finn and Co., Inc. "Finn flex" steel spring vibration mountings or equal product by Amber-Booth, Consolidated Kinetics, Korfund Dynamics, Mason Industries or Vibro-Acoustics.

PART 5. TESTING, START-UP, BALANCING, ETC.

5.1. **General:** Conduct tests upon completion of the heating, ventilation and air conditioning installations, and at times as designated by the Architect. Furnish written reports to the Architect of all tests results. Provide copies of all test results in the Bound and Framed Instructions specified hereinbefore. Furnish all necessary personnel, test instruments, power, fuel, etc., as required to complete the specified requirements.

5.2. **Refrigerant Piping Testing:** The Mechanical Contractor must provide two tests for the refrigerant piping installation. The medium used for pressure testing the refrigerant system must be oxygen-free nitrogen, helium or argon. Oxygen, air, combustible gases and mixtures containing such gases must not be used as a test medium. Systems erected on the premises with tubing not exceeding 5/8 inch outside diameter must be allowed to use the refrigerant identified on the nameplate label or marking as the test medium.

The refrigerant piping system must be tested as a whole, or separate tests must be conducted for the low-pressure side and high-pressure side of the piping system. The refrigerant piping system must be tested in accordance with both of the following methods:

Test 1: The system must be pressurized for a period of not less than 60 minutes to not less than the lower of the design pressures or the setting of the pressure relief device(s). The design pressures for testing must be the pressure listed on the label nameplate of the condensing unit, compressor, compressor unit, pressure vessel or other system component with a nameplate. Additional test gas must not be added to the system after the start of the pressure test. The system must not show loss of pressure on the test pressure measuring device during the pressure test for a minimum 24 hours.

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Test 2: A vacuum of 500 microns must be achieved. After achieving a vacuum, the system must be isolated from the vacuum pump. The system pressure must not rise above 1,500 microns for a period of not less than 60 minutes.

Where using refrigerant as a test medium as specified above, the test pressure must be not less than the saturation dew point pressure at 77°F.

As required by IMC 1110.8, the installation contractor must issue on his company letterhead, to the Local Code Official and the Authority Having Jurisdiction, a certificate of testing for all systems containing 55 pounds or more of refrigerant. The certificate must give the unit number as shown on the plans, the test date, name of the refrigerant, test medium and the field test pressure applied to the high pressure side and the low-pressure side of the system. The certification of the test must be signed by the installation contractor.

5.3. **Ductwork for Systems Less Than 2,000 CFM:** The Mechanical Contractor must test all supply, return, relief and outside air, exhaust ducts, plenums and casings and make substantially airtight before covering with external insulation or concealing masonry. Substantially airtight must be construed to mean that no air leakage is noticeable to the senses of touch or sound at joints.

5.4. **Testing of all Fire and Smoke Dampers:** The Mechanical Contractor, with assistance from the Testing and Balancing Contractor, must test all fire and smoke dampers and verify installation of access panels to each damper. Test all fire dampers by cutting/releasing holding mechanism and verify that dampers close properly. Install new fusible links after testing each fire damper. Test activation of smoke dampers and required interlocks with smoke. Certify in writing that all dampers have been checked and perform correctly.

5.5. **Testing of Smoke Detectors:** The Mechanical Contractor must attend the testing of all smoke detectors which are a part of the mechanical system. A smoke machine is required to be used for testing the smoke detectors. Anything other than a smoke machine is not allowed. Coordinate the provision of the smoke machine three days prior to the day of testing with the Electrical/Fire Alarm Contractors and provide as required. **If a smoke machine is not present at the time of testing, DCM and/or the Engineer, as applicable, will cancel on-site, the site visit and a reinspection fee imposed, with all costs of the re-inspection to be borne by the Contractor.**

5.6. **Domestic Water Circulating System:** The Testing and Balancing Contractor must test and adjust domestic water recirculation system to ensure hot water circulation in all mains. Provide flow rate of pump and determined head.

5.7. **Performance Tests:** After cleaning, balancing, and testing are completed as specified, test each system as a whole to see that all items perform as integral parts of the system, and that temperatures and conditions are evenly controlled throughout the building. Verify all sequences of operation and submit report. Make corrections and adjustments as necessary to produce the indicated conditions.

All work must be performed by an independent test and balancing agency whose primary business is the testing and balancing of heating and air conditioning systems and its related components. The Test and Balancing Contractor must hold a current NEBB or AABC certification. Proof of certification must be provided at the submittal stage.

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The test must cover a period of not less than three days and must demonstrate that the entire system is functioning properly. Provide the following:

Date of testing, space temperature and humidity, outdoor air temperature (DB & WB), air temperature entering condenser coil; and load amperes for all motors. Also, provide CFM readings at all grilles, registers and diffusers and entering and leaving air temperatures at each evaporator coil.

Provide a typed list indicating job setting of all automatic controls. Include settings of thermostats, humidity controls, CO_2 sensors, safety controls, minimum damper settings, fire-safety thermostats, pressure controls, temperature controls, and other similar items. Tabulate to show type of control, location, setting and function. Verify that all safety settings and limits are appropriate and comply with current safety Codes and Regulations for the respective system.

After building is occupied, adjust as requested by Owner.

5.8. **Balancing:** The Testing and Balancing Contractor must check airflow at all supply air, return air and exhaust air devices, all diffusers and outside air intakes with a recently calibrated direct-reading velocity instrument. Adjust systems to deliver, supply air, return air, outside air and exhaust air quantities to within 10 percent of the indicated amounts. Provide instruments and otherwise assist the Architect in checking balancing at final site visit.

5.9. **Settings:** Contractor must permanently mark the settings of all valves, dampers, and other adjustment devices in a manner that will allow the settings to be restored. If a balancing device is provided with a memory stop, it must permit the closing and reopening of the device to its balanced position.

5.10. **Unit Protection Verification:** The Test and Balance Contractor, with cooperation from the Mechanical Contractor, must verify that all phase protection specified has been installed where specified, and installed per the Manufacturer's requirements. The verification of this requirement must be furnished in tabular form with findings included in the test and balance report. The summary must list all equipment specified to have the protection, verification that the device is installed per the Manufacturer's recommendation and has been programmed to the Owner's requirements.

5.11. **Test Data:** The Testing and Balancing Contractor must submit typewritten report as specified above. Include schedules of readings taken during the testing and balancing operations and a line diagram or plan of the system indicating specified quantities and final balanced quantities **seven (7) days prior to final site visit**. **The Alabama Department of Construction Management (DCM) will cancel on-site, the site visit if the test and balance report has not been submitted as specified. Failure to comply with this provision will be cause for cancellation of the site visit, and a reinspection fee imposed, with all costs of the re-inspection to be borne by the Contractor. No final site visit must be made without this data.** Report the required or specified reading, the first reading taken, and final balanced reading for the following items:

Fans: Size, type, fan motor speed in rpm, outlet velocity in fpm, static pressure inches water, air quantity in cfm, and motor load in amperes.

Air Handling Equipment: Size, type, fan speed in rpm, outlet velocity in fpm, external static pressure inches water, total static pressure inches water, air quantity

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cfm, and motor load in amperes.

All Air Outlets and Inlets: Size, velocity in fpm, and air quantity in cfm.

Coils: CFM, size, face velocity in fpm; air temperature entering coil and air temperature leaving coil, wet-bulb and dry-bulb degrees F.

Refrigerant Hot Gas Reheat Coils: The Mechanical Contractor, with assistance from the Testing and Balancing Contractor, must adjust the humidistat so that the hot gas reheat coil valve opens. Verify modulation of the coil valve. Provide coil size, face velocity in fpm; air temperature entering coil and air temperature leaving coil, wet-bulb and dry-bulb degrees F.

Ducts: Size, velocity in fpm, and air quantity in cfm.

Heat Pumps Auxiliary Heaters, Air Handling Units and Make-up Air Units Electric Heaters: Provide heater capacity (KW), amperage loads and number of stages of heat and/or verify SCR control as applicable.

Air Cooled Condenser Sections of All Outdoor Units: Air temperature entering condenser coil; refrigerant suction temperature and pressure at compressor and evaporator coil; condensing temperature and pressure and load amperes for all motors.

5.12. **Control Settings:** In cooperation with the HVAC Controls Contractor and/or the Mechanical Contractor as required, must calibrate, adjust, and verify sequences of operation and the control systems, including the refrigerant hot gas reheat coils, to show that the requirements of these specifications have been met.

Verify all specified sequences of operation and provide report.

Provide a tabulation of setting on all controls indicating set point and throttling range, etc. after controls and systems have been finally adjusted. Include settings on safety controls and cutouts. Verify that all safety settings and limits are appropriate and comply with current safety Codes and Regulations for the respective system. Provide a typed list indicating job setting of all automatic controls. Include settings of thermostats, humidity controls, CO_2 sensors, safety controls, minimum damper settings, fire-safety thermostats, pressure controls, temperature controls, and other similar items. Tabulate to show type of control, location, setting and function. Verify that all safety settings and limits are appropriate and comply with current safety Codes and Regulations for the respective system.

5.13. **Seasonal Adjustments:** At the beginning of the first heating season adjust and balance operating phases and repeat at the beginning of the first cooling season or vice versa as requested by the Architect or Owner.

5.14. **Notification:** Notify the Architect one week prior to all testing. The Contractor must provide all testing equipment and must furnish written reports to Architect of all tests results. Additionally, provide copies in the Bound and Framed Instructions specified hereinbefore.

PART 6. TESTING AND BALANCING AIR DISTRIBUTION AND HYDRONIC SYSTEMS

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6.1. **Procedure:** Test and balance all systems per current edition of the Associated Air Balance Council National Standards for Total System Balance, 7th Edition, 2016, Section IV, as applicable to air distribution and hydronic balancing. Employ instruments that have been calibrated within six months and checked for accuracy just prior to start of work. Provide for all work as specified in Section IV, Chapters 16, 17, 18, 19, 20, 21, 22, 23, and 24. The entire, 7th Edition, 2016, AABC Standards Manual is applicable, as if written in full herein. Indicate date of testing, space temperature and humidity, outdoor air temperature (DB & WB). Use Manufacturer's data for pressure drops through coils, chillers, condensers, etc. and pump performance curves. Include temperature of chilled water and/or hot water and discharge air from each AC unit and coil. The Contractor must provide additional dampers, valves, drive changes, etc. as required to obtain specified results. Check airflow at each supply, return, exhaust grille, register and diffuser and outside air intakes with a recently calibrated direct-reading velocity instrument. Adjust systems to deliver quantities within 10 percent of the indicated amounts.

Setting of balancing valves and dampers must be clearly, neatly and permanently marked so they can be reset at any time.

After building is occupied, adjust as requested by the Architect.

6.2. **Seasonal Adjustments:** At the beginning of the first heating season adjust and balance operating phases and repeat at the beginning of the first cooling season or vice versa as requested by the Architect or Owner.

6.3. **Control Systems:** In cooperation with the HVAC Controls Contractor and/or the Mechanical Contractor as required, calibrate, adjust, and verify sequences of operation and the control systems, including the refrigerant hot gas reheat coils, to show that the requirements of these specifications have been met. Provide a report indicating that the specified sequences of operation are as specified. Provide a tabulation of setting on all controls indicating set point and throttling range, etc. after controls and systems have been finally adjusted. Include settings on safety controls and cutouts. Verify that all safety settings and limits are appropriate and comply with current safety Codes and Regulations for the respective system.
Provide a complete report.

6.4. **Sound and Vibration Testing:** The Testing and Balancing Contractor must provide this testing in accordance with Section II, Chapter 14 of the AABC Standards Manual.

6.5. **Unit Protection Verification:** The Test and Balance Contractor, with cooperation from the Mechanical Contractor, must verify that all phase protection specified has been installed where specified, and installed per the Manufacturer's requirements. The verification of this requirement must be furnished in tabular form and findings included in the test and balance report. The summary must list all equipment specified to have the protection, verification that the device is installed per the Manufacturer's recommendation and has been programmed to the Owner's requirements.

6.6. **Domestic Water Circulating System:** The Testing and Balancing Contractor must test and adjust domestic water recirculation system to ensure hot water circulation in all mains. Provide flow rate of pump and determined head.

6.7. **Testing and Balancing Contractor:** All work must be performed by an independent test and balancing agency specializing in testing and balancing air conditioning systems. The test and balancing contractor must be NEBB or AABC certified.

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Balancing agencies must submit experience record and references to Engineer for review a minimum of seven (7) days before bid date.

6.8. **Notification:** Notify the Architect one week prior to final testing. The Contractor must provide all testing equipment.

6.9. **Report: Submit report with all performance data seven (7) days prior to the final site visit. The Alabama Department of Construction Management (DCM) will cancel on-site, the site visit if not completed as specified. Failure to comply with this provision must be cause for cancellation of the site visit, and a reinspection fee imposed, with all costs of the re-inspection to be borne by the Contractor. No final site visit will be held until the Engineer has reviewed this report.**

PART 7. SHEET METAL DUCT WORK (LOW VELOCITY 2" S.P.)

7.1. **General Scope:** Provide as shown and as required for the air conditioning, heating and ventilation systems. Make changes in dimensions, offsets or crossovers as necessary to clear piping, lights and structural members, and to maintain scheduled headroom. Provide all accessories required. Refer to architectural drawings and specifications.

All exposed internally lined or double wall ductwork must be paint grip finished or must be primed in the field to receive paint. Refer to Architectural section “Painting” for painting of exposed ductwork. In case of the absence of painting requirements in the aforementioned Specification Section(s), the interior and exterior of ductwork visible from any finished space must be cleaned, primed and painted with two coats of paint as directed by the Architect. Ductwork visible through all grilles, registers, diffusers, ceilings, etc. must be painted flat black with paint having a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84.

7.2. **Protection of Interior of Duct from Debris:** ALL open portions of ductwork must be covered with a self-adhesive film or airtight sheet metal caps to prevent the intrusion of contaminates. All duct taps, duct take-offs, etc., must be protected immediately after the tap, take-off, etc. has been fabricated in the field. When sections of sheet metal are delivered to the facility for fabrication in the field, which cannot be protected with the specified material, the sheet metal must be covered with Visqueen. Prior to erecting the same, ductwork must be manually cleaned to remove all dust, dirt and construction debris. All ductwork must be erected clean. After each section of ductwork is erected, immediately protect all openings as specified herein before. In effect, there must be no ductwork opening that is exposed to the ambient air. The material must be a minimum 3-mil thickness and have a minimum tensile strength of 10 psi. It must be UV resistant, waterproof and recyclable. Material must be DuroDyne Dyn-O-Wrap or approved equivalent. **Any ductwork discovered to be unprotected as specified is subject to immediate rejection for use on this project.**

7.3. **Protection of Interior Ductwork and Equipment When Any Air Moving Equipment is Operating During Construction and Prior to Owner’s Occupancy:** It is the Mechanical Contractor’s responsibility to ensure the inside of each air handling unit and associated air distribution system is kept clean and not allow construction dust to infiltrate the system. Should the system become contaminated as determined by Architect, Engineer or Owner, the Mechanical Contractor must be responsible for cleaning.

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If air moving equipment must be used during construction, temporary filtration media with a Minimum Efficiency Reporting Value (MERV) of 8, as determined by ASHRAE 52.2 and must be installed at each return air grille, return air register, exhaust grille, exhaust register, and unit return air inlet.

The General Contractor must make a written request to the Architect for permission to temporarily operate any equipment during construction. The request must be made a minimum of seven (7) days prior to the desired date of the interruption. Do not operate any equipment without the Architect's written approval.

7.4. **Sizes:** Take measurements at job and fit work into available space. Report to the Architect any unworkable conditions encountered and alter layout or duct sizes as directed without additional cost to the Owner or the Owner's Project Design Professionals. Unless otherwise approved, conform to dimensions indicated. Duct dimensions shown indicate NET FREE AREA after installation of duct liner; increase sizes indicated to allow, therefore.

7.5. **Sheet Metal:** ARMCO, or equal, prime quality, G-90 galvanized sheet steel conforming to ASTM A653. Unless indicated otherwise on the plans, gauges must be as recommended in SMACNA "Duct Construction Standards", 4th Edition, 2021 **but in no case must be less than listed in the table below for the respective duct largest dimension or diameter**. **No 26 gauge ductwork is allowed unless specified otherwise.**

4 to 18 inches	24 ga.
19 to 30 inches	22 ga.
31 to 42 inches	20 ga.
43 to 84 inches	18 ga.
Over 84"	16 ga.

For stainless steel or aluminum ductwork, duct gauges must be as defined in SMACNA "Duct Construction Standards", Table 1-3 in the 3rd Edition, 2005.

7.6. **Acceptable Manufacturers:** McGill Airflow, Southeastern Metals (SEMCO), Hamlin Sheet Metal, ECCO Manufacturing, Conklin, Spiral Systems Inc or Eastern Sheet Metal, Inc. All other manufacturers require 7-day prior approval.

7.7. **General Fabrication:** Construct and erect in a skillful manner, meeting requirement of the current SMACNA "HVAC Duct Construction Standards", 4th Edition, 2021 for 2" static pressure unless noted or specified otherwise. **Where conflicts occur between current SMACNA requirements and the contract drawings or these specifications, the most stringent requirements must apply. In general, the heaviest gauge metal and the strictest installation/fabrication methods must be provided.** Form straight and smooth on the inside, with joints neatly finished. Make up in sections of such length that mechanic can reach through the open end to seal insulation at previous joint. Assemble and anchor to be completely free from vibration and drumming under all conditions of operation. Make takeoffs at round ducts with factory fabricated round-to-rectangular and rectangular-to-round transitions.

All rectangular ductwork traverse joints over 23" must be made with all metal DuctMate joints system manufactured by DuctMate Industries, Inc., Quikduc Transverse Duct Connection Systems or Duro Dyne Dyn-O-Mate. DuctMate system must be installed in strict accordance with current SMACNA and Manufacturer's recommendations and instructions.

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Where ductwork penetrates non-rated partitions above the ceiling or insulation support/attic air barriers, draft stops and similar partitions, the openings must be sized as required for duct and insulation, plus 2” and sealed as specified below. Provide duct supports as specified within 12” of each side of the partition penetrated. **DO NOT ALLOW DUCT TO REST ON PARTITION WALLS**.

Demolish and modify existing roof, walls, floors, partitions and ceilings as required to accomplish the required work. Remove existing ductwork, valves, hangers, supports, existing piping, etc. and saw cut or core drill new and existing floors, walls, partitions, ceilings, etc., as required to install new piping, duct, etc. Do not reuse any existing hangers, supports, valves, piping, duct, etc. All items must be new. All roofing work must be provided by the roofing contractor. Roofing work required for existing roofs must be by the roofing contractor that provided warranty.

All penetrations of new floors and partitions are required to be built-in as work progresses. All penetrations of new construction that were not built-in as required by these specifications, and all new penetrations of existing floors, walls and partitions must be core drilled or sawcut large enough to allow all conduits, piping, ductwork, firestopping assemblies, etc., to continue uninterrupted, and to provide proper firestopping of the penetration as required to install new items as shown and/or specified.

Reconstruction and repair of the demolished/modified items must be as directed by the Architect. Coordinate demolition and repairing/rebuilding of items with General Contractor prior to bid to allow for installation of the new items as required.

Where penetration occurs at rated assemblies, provide appropriate fire damper and install as specified and detailed.

Where penetration occurs at non-rated assemblies, the maximum allowable gap/void around the duct penetration must be 2”. Any penetration larger than 2” must be filled to the 2” mark using the same materials used to construct the assembly. Thereafter, the penetration between the assembly and the duct must be filled with fire resistant mineral wool insulation and sealed on both sides of the assembly with a fire stopping compound to prevent the passage of smoke and fire. After sealing, provide a 6" wide, 16 gauge galvanized steel closure plate around the penetration on each side of the assembly. Closure plates must fit snugly to the duct and must be secured to the wall. All ductwork and closure plates that are exposed to view in finished areas must be primed and painted as directed by the Architect. **Do not install closure plates until Engineer or Architect has verified the proper sealing of the penetration. If closure plates are installed prior to the Architect’s or Engineer’s inspection, they will be removed to verify proper sealing as specified above.**

Where ducts pass through floors that do not require fire dampers, fill void with fire retardant mineral wool insulation and seal with fire stopping material to prevent the passage of smoke and fire. Thereafter, support duct and close opening with minimum 2”x2”x1/4” steel angles on all sides and, secured to both floor and duct. At plenums and risers just above the floor, provide suitable chair assemblies of welded structural shapes. **Do not install angle iron around opening until Engineer or Architect has verified the proper sealing of the penetration.**

Provide additional supports to raise ductwork off any metallic item above the ceiling. Wherever any bare metallic piping, conduits and metallic structural members are in contact with externally insulated duct or bare sheet metal duct, there must be

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dielectric separation provided. The Contractor must provide 3/4" thickness, **unslit** AP Armaflex insulation of sufficient inside tubular diameter to snuggly and completely cover the respective metallic item. The insulation must extend the full length of the affected area plus 6" on both sides. Refer to Part "Pipe Insulation and Miscellaneous Insulation Work" in this division for AP Armaflex material specification. The use of Rubatex insulation between piping and the ductwork will only be allowed when providing the proper supports is not an option.

Refer to Paragraph "Hangers and Supports" in this Section 15700 for additional requirements.

7.8. **Exposed Ductwork:** Install tight against the wall, overhead structure or ceiling with drive slip joints and other supports as required. Refer to Architectural plans for duct locations. If duct locations are not shown on the Architectural plans, coordinate locations with the Architect prior to fabricating or installing any ductwork.

Required openings in exterior perimeter walls, and interior walls and partitions must be saw cut or properly blocked out and present a neat appearance. Where penetration occurs at rated assemblies, provide appropriate fire damper and install as specified and detailed. Where penetration occurs at non-rated assemblies, it must be installed as specified hereinbefore in Paragraph, General Fabrication.

All floor penetrations must be as specified in Paragraph "Hangers and Supports" in this Section 15700.

All ductwork and closure plates that are exposed to view in finished areas must be primed and painted as directed by the Architect. Penetrations and closure of the penetrations must be as specified above. **Do not install closure plates until Engineer or Architect has verified the proper sealing of the penetration. If closure plates are installed prior to the Architect's or Engineer's inspection, they will be removed to verify proper sealing as specified above.**

All exposed rectangular ductwork traverse joints must be made with all metal DuctMate joints system manufactured by DuctMate Industries, Inc., Quikduc Transverse Duct Connection Systems, Duro Dyne Dyn-O-Mate or approved equivalent. DuctMate system must be installed in strict accordance with current SMACNA and Manufacturer's recommendations and instructions.

All exposed internally lined or double wall ductwork must be paint grip finished or must be primed in the field to receive two coats of paint. Refer to Architectural section "Painting" for painting of exposed ductwork. In the absence of painting requirements in the aforementioned Specification Section(s), the exterior of ductwork visible from any finished space must be cleaned, primed and painted with two coats of paint as directed by the Architect.

Ductwork visible through all grilles, registers, diffusers, ceilings, etc. must be painted flat black with paint having a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84.

7.9. **Cross-Joints, Seams, Stiffening and Sealing:** Join and stiffen with combination of joint types, connectors and structural angles that are a minimum of two gauges heavier than the duct for the sizes shown as recommended in current SMACNA "HVAC Duct Construction Standards", 4th Edition, 2021. **Cross break all flat areas over 35 inches wide.** Install internal ends of slip joints in the direction of flow.

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All transverse joints with long dimension over 23" must be made with all metal DuctMate joints system manufactured by DuctMate Industries, Inc., Quikduc Transverse Duct Connection Systems or Dyn-O-Mate with roll-formed flanges, corner pieces, gasket, and cleat. The system used must be installed in strict accordance with current SMACNA and Manufacturer's recommendations and instructions.

Make all cross joints and all branch, grille and diffuser take-offs, except DuctMate joints, air tight by applying fibrated, low VOC, LEED v4 (UL 2818) compliant duct sealer. Sealer must meet and pass UL 181B-M, ASTM G21 (fungus resistant), ASTM D5590, NFPA 90A/90B and EPA/NSF/ANSI regulations. Sealer must meet the requirements for the pressure classification of the ductwork installed.

The sealant must be Hardcast Iron Grip 601, Duro Dyne Duro Seal EDS-RS, Design Polymerics DP1020 or United McGill Uni-Mastic 181.

7.10. **Branch Ducts to Diffusers:** Round runouts to diffusers, up to and including 14” round, must be 24 ga., G-60 galvanized, DuctMate Series GreenSeam +Snap Lock pipe with factory sealed longitudinal and transverse gaskets. Gasket for GreenSeam +Snap Lock pipe must contain antioxidants, fungicides, adhesion promoters, zero VOCs and must meet or exceed ASTM E-84 test requirements. 16” round to 20” round runouts must be 24 ga. and equal to DuctMate Series Reeves Lock Pipe, G-60 galvanized pipe.

7.11. **Branch Duct Take-Off:** Provide at all points where branch ducts take off from trunks, and where ducts divide. Refer to details on the drawings. Damper must be minimum 22 Ga., G-90 Galvanized steel with 2” build out. Body must be a minimum of 24 Ga., G-90, galvanized steel with 4” W.G. construction. Fitting must have 1” flange with corner clips, pre-punched mounting holes and adhesive coated gasket. Take-off must be Flexmaster LDS, BO3, GSI HETO, HTS2, Elgen HETO or Crown 3300-DS2.

7.12. **Turns and Transitions:** Fabricate turns with an inside radius equal to width of duct. At 90-degree turns, Contractor may substitute square elbows, with standard factory-made, multiple, double-blade constructed vanes. Vanes must be a double wall, true airfoil contour with smoothly rounded entry nose with extended trailing edge. Vanes must be formed from a single piece of 26 ga., hot dipped galvanized steel and must be 3” radiused vanes on 2.4” centers. Vanes must be provided with two (2) tie rods and continuous internal tubes for stiffening and rigidity. Maximum pressure drop must be .06” W.G. at 1500 FPM. Generated sound power level must not exceed 54 decibels in band 4 at 2000 FPM (24”x24” duct size). **Single wall turning vanes are not allowed.** Vanes must be manufactured by Aero/Dyne Series HEP, Duro Dyne HTV/DHV, DuctMate, Hamlin Sheetmetal or Spiral Systems Inc. Avoid abrupt changes in shape, with a slope of 4:1, the minimum allowed.

7.13. **Return Air Platforms:** Return air platforms must be constructed with 1-1/2”x1-1/2”x1/4” steel angle iron frame and 18 ga. G-90 galvanized steel all sides, top and bottom, then sealed airtight by welding or soldering. Insulate all sheet metal sides, top and bottoms with 2” thickness, 1.5 lb. density, unfaced duct liner, same as internally lined ductwork. Provide angle iron supplemental supports and pedestal type pipe columns to support the units and allow individuals to stand on the platform without platform deformation or failure. Platforms must be a minimum of 24” tall, or as space permits. The bottom of all wall mounted return air registers that are connected to the return air platform must be approximately 6” above the finish floor, i.e., above the Architectural base.

No combustibles are allowed within the return air platform.

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7.14. **Motorized Dampers Used with Automatic Controls:** See Controls at end of Section 15700.

7.15. **Volume Dampers:** For round ducts less than 12" diameter and rectangular ducts less than 12" in height in either dimension: Class 1A leakage, single leaf, blade constructed with 20-gauge galvanized metal frame and locking type control quadrant, single center U-bolt and pivot rod extending through opposite side of duct with brass bushing at both ends. Dampers must be manufactured by Ruskin MD-35, United Enertech MD-105, Greenheck MBD-10, Nailor 0800 or Pottorff CBD-01.

7.16. **Volume Dampers:** For round ducts greater than or equal to 12" diameter or rectangular ducts greater than or equal to 12" height in either direction, provide opposed blade, airfoil blades of 16 ga.-galvanized steel mounted in steel frames by 3/8" steel trunnions riding in brass bushing with dual U-bolts. Blade width must not exceed 10 inches and individual blade length must not exceed 48 inches. Extend one trunnion to permit operation from outside the duct. Provide manually operated dampers with cadmium plated steel locking quadrant. Dampers opening to the outside must have felt edges. Dampers must be manufactured by Ruskin MD-35, United Enertech MD-105, Greenheck MBD-15, Nailor 0810 or Pottorff CBD-01.

7.17. **Stand-Off Mounting Brackets:** Locking-type quadrant operators for dampers, when installed on ducts to be externally insulated, must be provided with standoff mounting brackets, bases and adapters as required to provide clearance between the duct surface and the operator not less than 2" greater than the thickness of the insulation. Standoff mounting items must be integral with the operator or standard accessory of the damper Manufacturer as specified above.

7.18. **Duct Instrument Test Holes:** Provide for each system four test holes (two in supply duct and two in return air plenum) at opposite ends near air handling units with screwed caps. In addition, at duct mounted coils and electric duct heaters provide one on either side of the coil or duct heater.

7.19. **Flexible Connections and Bonding Jumpers:** Install so that the cloth is in folds (not drawn tight). Connect all ducts to air handling equipment and fans, except dome type fans, with preassembled flexible connection. Fabric width must be 6" for all air handling equipment. Ceiling mounted exhaust fans and VAV terminal units must be 4" width.

Connectors for all air handling equipment, including VAV terminals, must be a factory fabricated and assembled unit with 6" dual fabric, heavy duty, 20 oz/sq. yd polyester/polyester fabric with flame resistant coating and mildew resistant per ASTM G-21. The assembly must comply with NFPA 701, NFPA 90A, NFPA 90B and ASTM E-84. The unit must be constructed of a minimum of 24 ga. galvanized steel meeting ASTM A-653-94-G60. Metal to fabric connectors must be double locked, airtight and waterproof to 10" W.C. positive pressure and 10" W.C. negative pressure. The assembly must be DuctMate PROflex with power lock connection or approved equivalent by DuroDyne.

Flexible connections for ceiling exhaust fans and VAV terminals must be preassembled flexible connection of 29 ounce fire-resistant, neoprene coated glass fiber cloth equal to Ventfabrics "Ventglas" (4" fabric width) and manufactured by Ventfabrics, Wiremold or Thermaflex.

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Provide preassembled flexible connections for all ducts that cross building expansion joints. Flexible connections must be 6” in width as specified hereinbefore. Coordinate requirement with Architectural plans and provide as required.

Externally insulate all flexible connectors to prevent condensation with 2” thickness external duct insulation as specified later in this section. **Do not insulate flexible connectors until the installation of the below specified bonding jumper has been verified.**

Prior to insulating, provide copper jumpers across all flexible connectors taking care that jumpers do not bind flexible connections. Provide compression lug and grounding connector screwed into the duct with one (1) screw, on both side of the flexible connector. Bonding wire must be minimum shielded 12 AWG.

7.20. **Miscellaneous Bonding/Grounding of Metallic Items:** Wherever any bare metallic piping, conduit, structural elements or any other metallic assembly is in contact with externally insulated duct or bare sheet metal duct, bonding/grounding must be provided. The Contractor must provide 1/2” thickness, unslit AP Armaflex insulation of sufficient inside tubular diameter to snuggly and completely cover the respective metallic item. The insulation must extend the full length of the affected area. Where channel shapes are used, orient the open side of the Unistrut assembly down. Materials that are not supported by Unistrut, sheet Armaflex may be used provided it is properly attached to the duct or affected items. Refer to Part “Pipe Insulation and Miscellaneous Insulation Work” for AP Armaflex material and installation methods specification.

7.21. **Register and Grille Connections:** Where take-offs are in side of a duct, clinch lock short tee sections onto trunk. Install collars with slip joints and 3/4” flange at outlet end. At sheetrock and other hard surfaces, set the collars exactly flush with surface.

Install boots above lay-in ceilings simultaneously with ceiling work.

At return air, relief air and exhaust air grilles 36” or more in either dimension, collars must be 1” x 2” x 1/8 inch steel angle frames with corners mitered, welded and ground smooth. Frames in the ceiling must be independently suspended from the ceiling structure, or the duct must have special reinforcing to prevent sagging of the boot.

The interior of all ductwork visible through grilles and diffusers must be painted flat black with paint having a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84.

7.22. **Hangers and Supports:** **Duct hangers must NOT penetrate the external insulation vapor barrier. All duct hanger materials must be external of the insulation materials, insulation jacket and vapor barriers. All vapor barriers must be continuous and without penetrations.** All supports, assemblies, related components, attachments and required appurtenances must be sized for a minimum of 300% (3 times) the anticipated load carried by the respective assembly. Where the Contractor has doubts about proper supporting requirements, he must consult with, and seek the guidance of, the Architect and the Structural Engineer.

Where duct supports are specified to be a Unistrut assembly, the Unistrut must be painted, powder coated, epoxy or plastic, same as specified above and in Section 15010, Part 4, Para. Coatings and Finishes. Duct Unistrut support assemblies of galvanized, zinc and similarly coated items are considered to **NOT** be coated. All

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must be painted, powder coated, epoxy or plastic coated. Hanger rods and associated bolts, and clamps on Unistrut assemblies are not required to be painted.

All paint and coatings must have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84.

"Sammy" bolts are prohibited. Contractor must provide supplemental steel between structural purloins, bar joists, etc., for duct support as required to meet support spacing specified. Supplemental steel must be welded in place as directed and specified by the Structural Engineer. Support small (less than 40 united (w+h) inches) horizontal ducts without external insulation with 1-1/4" x 20 ga. band hangers. Provide in pairs close to each transverse joint and in no case more than six feet apart. Bands must be turned 3" under the lower corner of ductwork and fastened with one (1) self-tapping screws into the bottom of the duct surface. Bands must be attached up the sides of the ductwork at a maximum of 6" intervals and in the bottom of the duct. Seal all screws with duct sealer as specified for ductwork.

Support vertical runs larger than 40 united (w + h) inches with structural brackets with welded joints.

Support all non-externally insulated horizontal ducts larger than or equal to 40 united (w+h) inches on trapeze type hanger assembly same as specified below for externally insulated duct except without AP Armaflex surround on the Unistrut. Install inserts or clamps as required to accommodate overhead construction. Spacing must not exceed 6 feet.

All 14" or less concealed round ducts with external insulation must be provided with band hangers and saddles. Suspend ducts, at six (6) foot intervals with 8" long, 3" wide, 22 gauge galvanized metal saddles hung from structure with 22 gauge, 1" wide straps. Bands must pass completely under and around round ducts. Loop strap under duct and attach to strap with two (2) galvanized bolts. Thereafter, loop top end of hanger over steel structural members above and fasten with two (2) galvanized bolts. Where concrete joists occur overhead, secure straps to side of joist with galvanized expansion or ramset bolts. Where flat concrete surface occurs overhead, secure with ramset or expansion bolt fasteners. See other Specification Sections in the Contract Documents for limitations on use of power driven fasteners.

All concealed and externally insulated rigid round metal ducts greater than or equal to 16", all externally insulated rectangular ductwork, all externally insulated square ductwork, and all externally insulated flat oval ductwork that is specified to have external insulation with a vapor sealed facing **must be supported with trapeze hangers consisting of Unistrut, threaded rods and inserts or clamps as required to accommodate overhead construction.** Threaded rods must be of size required to provide support of 300% (3x) the anticipated load of the assembly. Trapeze hanger assembly spacing must not exceed 8 feet. Hanger rods must not be in contact with external duct insulation nor metal duct work.

Where ducts are specified to have external insulation with a vapor sealed facing, support duct on trapeze hangers consisting of a Unistrut assembly with threaded rods.

On externally insulated ducts, install 3/4" thickness, **unslit** AP Armaflex insulation of sufficient inside tubular diameter to slide over the Unistrut support, completely cover and snuggly fit to the bottom horizontal Unistrut duct support. The AP Armaflex

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insulation must extend the full width of the insulated/uninsulated duct plus a minimum of 6", each side. Space hanger rods a minimum of 6" (maximum of 12") from the sides of the ductwork to permit the duct to be placed within the trapeze hanger assembly without being in contact with the externally insulated ductwork or bare metal ductwork. Where channel type Unistrut shapes are used, orient the open side, down. Refer to Part "Pipe Insulation and Miscellaneous Insulation Work" for AP Armaflex material and installation methods specification.

All concealed internally insulated round ducts must be supported as specified above for externally insulated ductwork except without insulation saddle. Coordinate exposed duct support requirements with plan details.

Wherever any duct hanger support exceeds 36" length from the top of the supported duct to the structure above, do not use band hangers. The Contractor must provide a Unistrut support assembly and provide bracing of the assembly with minimum 1"x1"x1/4" angle iron, all as required for minimum 300% (3x) the weight of the assembly supported, and to prevent swaying of the duct work. Weld angle iron to or attach to the Unistrut assembly and then attach to the overhead structure. The entire support/bracing/sway bracing assembly must be as directed by the Architect and the Structural Engineer.

Where ducts pass through floors that do not require fire dampers, fill void with fire retardant mineral wool insulation and seal with fire stopping material to prevent the passage of smoke and fire. Thereafter, support duct and close opening with minimum 2"x2"x1/4" steel angles on all sides and, secured to both floor and duct. At plenums and risers just above the floor, provide suitable chair assemblies of welded structural shapes. **Do not install angle iron around opening until Engineer or Architect has verified the proper sealing of the penetration.**

Where the ducts rise at the outside walls, the contractor must provide a welded chair assembly, required support, attachments and, related and required appurtenances. The duct riser at the outside wall must maintain a distance between the wall and the finished insulated assembly as required to insulate the back side of the ductwork.

Where horizontal ducts with standing joints exceed 72 inches in width they must be provided with additional hangers at the mid-point of their width, consisting of a support bolted to an interior 1/8 x 1-1/2 inch strap that must, in turn, be bolted to the duct. Internal straps and hangers must be spaced one for each duct section.

Where trapeze type hangers or DuctMate is used to support exposed ductwork in finished areas, the width of the support must not exceed the duct width by more than six (6) inches on either side of the duct.

7.23. **Flexible Air Ducts:** Flexible air duct must be factory made and composed of an inner duct of woven and coated fiberglass providing an air seal and permanently bonded to coated steel wire helix, a fiberglass insulating blanket and low permeability outer vapor barrier of fiberglass reinforced metallized film laminate. R-value must be a minimum R=8 per ASTM C-518.

Duct must be rated for a maximum pressure of 16" (4-10 in. ID) or 10" (12-16 in. ID) water column positive and 2" water column maximum negative pressure and 5000 FPM maximum velocity and Listed by Underwriters Laboratories, Inc., under UL Standard 181 as a Class 1 air duct and complying with NFPA Standards 90A and 90B. Duct must have a maximum flame spread of 25 and a maximum smoke developed rating of 50.

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Flexible duct length must not exceed six (6) feet. Supply each duct with 1/2" wide, 200 Series **stainless steel worm gear driver and stainless steel band** at take-off fitting and supply fixture connections equal to Thermaflex Snaplock clamp. Zip tying is not allowed.

Suspend ducts, at three (3) foot intervals with 8” long, 3” wide, 22 gauge galvanized metal saddles hung from structure with 22 gauge 1” wide straps. Loop strap under duct and attach to strap with two (2) galvanized bolts. Thereafter, loop top end of hanger over steel structural members above and fasten with two (2) galvanized bolts. Branch duct connectors for connecting round low velocity branches to rectangular low velocity trunks must be factory fabricated rectangular to round or round to rectangular (as applicable) take-off fittings as detailed on the drawings with damper and standoff mounting bracket.

Provide a full size radiused, 90 degree galvanized sheet metal elbow transition piece from flexible duct connection to each diffuser boot/neck. Where conditions in the field do not allow for 90 degree elbow, a 45 degree full size radiused elbow may be used. Note that this provision to use a 45 degree full radiused elbow must not be used when a 90 degree elbow can be otherwise provided. Elbow gauge must be as specified hereinbefore in Part, “Sheet Metal Ductwork” for respective duct size.

Seal all joint connections as specified.

The flexible duct must be GreenGuard Level 4 certified, Thermaflex M-KE, ATCO UPC #031 or Flexmaster Type 1M.

PART 8. DUCT INSULATION WORK (EXTERNAL)

8.1. **General: The Mechanical Contractor must not install external duct insulation.** All external duct insulation work must be provided by an independent third party licensed and experienced Insulation Subcontractor whose primary business is the sale and installation of insulation materials in accordance with insulation manufacturers’ requirements and these specifications.

The Insulation Subcontractor must provide a complete insulation submittal on his company letterhead detailing materials and methods as specified. **The Mechanical/HVAC submittal will be automatically rejected** and not reviewed without a submittal from the required Insulation Subcontractor.

Where a conflict exists between these specifications and the Manufacturer’s requirements, the strictest installation must be provided.

The finished insulation system must provide complete thermal barrier throughout the equipment and air distribution system, including effective and durable vapor barriers and vapor stops for any system or condition potentially subject to condensation. An insulation system must be provided to prevent condensation or potential thereof, to prevent the transmission of water vapor into the insulation system (vapor barriers), and to prevent transmission of water vapor within the insulation system should vapor barrier compromises occur during operation and/or maintenance of the building (vapor stops).

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The duct must be clean, dry, sealed and pressure tested before covering is applied. Cover flexible connections with insulation material as hereinafter specified to same thickness as adjacent duct. Install insulation with longitudinal seams at top and bottom of horizontal runs. Install multiple layers of insulation with longitudinal and end seams staggered. All insulation materials, coatings and mastics must be fire resistive per NFPA Pamphlet No. 90, ASTM C 411, must be UL listed and must have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84, NFPA No. 255 or UL 723.

Refer to Section Sheet Metal Ductwork, Paragraph “Hangers and Supports” in this Section 15700 for additional requirements and for miscellaneous insulating requirements for externally insulated ductwork.

8.2. **Material:** Provide GreenGuard certified glass fiber duct insulation with reinforced foil kraft laminate jacket, formaldehyde-free.

All **supply air and return air ducts** located in the attic, mechanical mezzanine or outside the building insulation envelope must be provided with a total of 3.5” thickness external insulation, in addition to the specified acoustical liner. The first layer must be **1.5” thickness, 0.75 lb. density, without reinforced foil kraft laminate jacket** and with characteristics specified above. The second layer must be **2” thickness, 1.5 lb. density, with reinforced foil kraft laminate jacket** and with characteristics specified below. When using this requirement, the insulation sub-contractor may use bare stainless steel wire or a single strip of FSK tape to hold the butt joints of the first layer together until the second layer of insulation is installed.

OPTION: In lieu of providing two layers of insulation for supply and return air ducts as specified above, the Contractor may substitute one layer of 4.25” thickness, 0.75 lb. density **with reinforced foil kraft laminate jacket** with characteristics specified below.

All **supply air** and **return air** ductwork located above the ceiling within the building insulation envelope and below the ASHRAE required air barrier, in chases and other similar areas, but not in the attic, or outside the building insulation envelope or in the mechanical mezzanine, must be provided with **2” thickness, 1.5lb. density, duct wrap with reinforced foil kraft laminate jacket** as specified below. Note that this requirement does not apply to ductwork that is exposed to view in finished areas. Refer to internal duct insulation requirements for duct exposed to view in finished areas.

All **outside air** and **exhaust air** ductwork must be provided with **1.5” thickness, .75lb. density, with reinforced foil kraft laminate jacket** as specified below. Note that this requirement does not apply to ductwork that is exposed to view in finished areas. Refer to internal duct insulation requirements for duct exposed to view in finished areas.

Thermal conductivity for **1.5” thickness** per ASTM C-518, **0.75 lb. density** must be not less than k=0.27 BTU·in/(hr·ft²·°F) and minimum installed R=4.2 at 75°F mean temperature with test based on material thickness compressed 25%.

Thermal conductivity for **2” thickness** per ASTM C-518, at its rated thickness, and **1.5 lb. density** must be not less than k=0.24 BTU·in/(hr·ft²·°F) and minimum installed R=6.3 at 75°F mean temperature with test based on material thickness compressed 25%.

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Thermal conductivity for **4.25" thickness** per ASTM C-518, **0.75 lb. density** must be not less than k=0.27 BTU·in/(hr·ft²·°F) and minimum installed R=12.0 at 75°F mean temperature with test based on material thickness compressed 25%.

See "Duct Insulation (Internal)" for internal acoustical insulation required in addition to the external insulation specified hereinbefore.

Supply air, return air, relief air and outside air ducts within enclosed mechanical rooms do not require flexible, external, duct insulation. Instead, supply air, return air, relief air and outside air ducts in all mechanical rooms must be insulated with 1" thickness, 4.25 lb. density, R=4.5, rigid glass fiber duct insulation to a point 8" vertically above the mechanical room ceiling into the attic or 8" horizontally above the ceiling of the adjacent conditioned space, as applicable. Seal all ends of bare, exposed insulation board with vapor barrier sealant. Seal all insulation joints with foil face fiberglass yarn and laminated adhesive tape as specified below and then completely cover all taped joints a minimum of 3" on both sides of the tape edges with fiberglass cloth and mastic as specified hereinbefore.

Facing must be aluminum foil reinforced with fiberglass yarn and laminated with fire resistant adhesive to Kraft paper. Thermal conductivity value must be per ASTM C-612, Type 1B, at its specified thickness and must be not less than k=0.22 BTU·in/(hr·ft²·°F) at 75°F mean temperature. Insulation must meet or exceed the requirements of ASTM E 84, UL 723, ASTM C1136, Type II:FSK, NFPA 90A, NFPA 90B, NFPA 255, FHC 25/50 and ASTM795. Moisture sorption must be less than 5% by weight and maximum moisture vapor transmission of 0.02 perms.

Insulation must be Owens-Corning Series 815 Spin-Glas or equivalent material by Knauf, Schuller or CertainTeed. Rigid board insulation is not required when equipment is located in the attic or on a mechanical mezzanine.

8.3. **Thickness:** Toilet/shower and janitor closet/housekeeping exhaust ducts, louver and brick vent plenums, back panels of ceiling diffusers, ceiling return air, ceiling relief air and ceiling exhaust air registers and grilles, and outside air ducts: 1.5" thickness, 3/4 lb. density with reinforced foil kraft laminate jacket. All other locations: Minimum 2.0" thickness and density specified above with reinforced foil kraft laminate jacket. Coordinate with variations specified above for additional layers or 4.25" thickness and provide as required.

See limits of acoustic insulation in Part Duct Insulation Work (Internal) below. Where duct board is specified within the mechanical rooms, external duct wrap insulation is not required.

8.4. **Manufacturer:** Johns-Manville Micro-Lite EQ, Type 150 or Type 75 with thickness and density as specified above. Equivalent material from Knauf, Schuller, Owens Corning or CertainTeed will be accepted.

8.5. **Ducts to be Insulated Externally:** Supply air and return air ducts including ducts with acoustical liner, outside air ducts, kitchen hood make-up air ducts, make-up air ducts, toilet/shower/housekeeping/janitor closet areas exhaust ducts, louver and brick vent plenums, dishwasher and other moisture/vapor laden exhaust ducts, short branch duct collar connections to grilles, registers and diffusers, 24" upstream and downstream of each electric duct heater, 100% outside air units inlet and discharge ducts, supply air and return air duct and sleeves associated with wall mounted packaged units, supply air fan intake and discharge air ducts related to storm shelters, all flexible canvas connectors, sound traps (silencers) and exterior

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rim/cone/panel of all ceiling diffusers, ceiling exhaust grilles and registers and ceiling return registers and grilles. Factory fabricated and insulated exposed ductwork within the building does not require external insulation unless located within mechanical rooms/spaces at which it must be insulated with duct board as specified hereinbefore.

See Part “Duct Insulation Work (Internal)” for sound attenuating insulation requirements of externally insulated ductwork.

Do not externally insulate flexible canvas connectors until installation of the specified bonding jumper has been verified by the Engineer or the Authority having jurisdiction. If insulated at the time of the site visit, the insulation will have to be removed to verify the proper installation.

8.6. **Application:** Sheet metal duct must be clean, dry and tightly sealed at all joints and seams before applying duct wrap. Installation must be in strict accordance with the Manufacturers recommendations and these specifications. Adhere insulation to sheet metal with a brush or roller in manufacturer recommended workable sections with a water based, LEED compliant, low VOC liquid, not spray, insulation bonding adhesive. Wrap insulation tightly on the ductwork with all circumferential joints butted and longitudinal joints overlapped a minimum of 2”. The 2” flange of the facing must be secured using 9/16” flare-door staples applied 6” on center and taped as specified hereinafter. On longitudinal joints, the overlap must be secured using 9/16” flare-door staples applied 6” on center and taped as specified hereinafter. For rectangular ducts wider than 23”, additionally support insulation with weld pins and speed clips 18” on center with a minimum of two pins and washers for each section.

The liquid adhesive must be UL-723, ASTM E-84, NFPA 90A and 90B, LEED and ASTM C916 compliant, low VOC, moisture and mildew-resistant with suitability for high-humidity environments. The liquid adhesive must be Design Polymerics DP 2502, Foster 85-60, Vimasco 581 or Childers Chil-Quik CP-127.

Stop and point insulation around access doors and damper operators to allow operation without disturbing duct wrapping. Insulate standing seams and stiffeners that protrude through the insulation with 2” thick, faced, flexible blanket insulation.

Vapor seal all seams, joints, pin penetrations, other breaks, circumferential and longitudinal joints with reinforcing mesh and coat with vapor barrier facing. Mesh must be **4” wide pre-sized glass cloth** adhered and finished with two (2) coats of UL 181A-M compliant for sheet metal and duct board applications and UL 181B-M compliant for flexible ducts and flexible connectors. The sealant must be McGill Uni-Mastic 181, Hardcast Versa-Grip 181, Vimasco Vima-Seal 749 or Childers Chil-Tuff CP-181, vapor barrier coating as required to completely cover the mesh. Fiberglass cloth must be Great Lakes Textiles Style GL1658, 20x10 thread count per square inch, 0.004-inch thickness and 1.60 oz. /sq. yd., Childers Chil Glas #10 glass mesh, Foster Mast-A-Fab polyester mesh or equivalent product by 3M. **No FSK or any metallic tape will be allowed.**

Any externally insulated duct with metallic vapor barrier that is in contact with metallic piping, conduits or metallic structural members must be provided with a section of Rubatex insulation between ductwork and the metallic member. Rubatex must be 3/4” thickness, AP Armaflex insulation of sufficient inside tubular diameter to slide over, completely cover and snuggly fit the contacted item. The insulation must extend the full width of the duct plus a minimum of 6”, each side of the duct. Refer to Part

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"Pipe Insulation and Miscellaneous Insulation Work" for AP Armaflex material and installation methods specification. The use of AP Armaflex insulation between piping and ductwork will only be allowed when raising the effected duct is not an option.

8.7. **Insulation Pins and Washers: The use of adhesives for attaching pins and washers to the ductwork is prohibited.** Pins must be cupped-head, capacitor-discharge-weld pins, zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.135 inch diameter shank, length to suit depth of insulation specified with integral 1-1/2 inch galvanized carbon-steel washer. Insulation retaining washers must be self-locking type formed from 0.016-inch thick galvanized steel with beveled edge sized as required to hold insulation securely in place but not less than 1-1/2 inches in diameter.

8.8. **Hot Gas Reheat Coil and Cabinet:** Where hot gas reheat coils are specified and the coil is not within the insulated Heat Pump or Air Handling Unit equipment cabinet, or if sweating occurs on the coil enclosure, externally insulate the hot gas reheat coil cabinet with 1.5" thickness, 4.25 lb. density, R=6.8, duct board equal to Owens-Corning Series 815 Spin-Glas. Protect external insulation with open weave glass or polyester cloth by Johns-Manville Duramesh, Childers Chil Glas #10 or Foster Mast-A-Fab, embedded between two 1/8" coats of Foster 60-91 (gray) Monolar Mastic or Childers Encacel X-1 (gray). Coordinate coil requirements with the Mechanical Contractor prior to the bid and provide as required.

PART 9. DUCT INSULATION WORK (INTERNAL)

9.1. **General:** All work by experienced applicators in accordance with Manufacturer's recommendations and these specifications. Where a conflict exists between these specifications and the Manufacturer's recommendations, the strictest installation must be provided.

Duct liner, mastics and materials must comply with all requirements and other building code requirements. All insulation materials (coatings and mastics) must be fire resistive per NFPA Pamphlet No. 90A and 90B and must be UL listed and must have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed as determined by ASTM E84. Liner materials must conform to the performance based ASTM C1071, which includes ASTM C518 Thermal Conductivity, ASTM C411 Temperature Resistance, ASTM C665 Corrosiveness, ASTM E84 Surface Burning Characteristics, ASTM C1338 Fungi Resistance, ASTM C1304 Odor Emissions and ASTM C1104 Moisture Vapor Sorption.

9.2. **Material:** Liner must be a GreenGuard certified, low VOC, Type I liner as defined by ASTM C1071 and characteristics complying with ASTM E 84, UL 723, NFPA 255, NFPA 259 and ASHRAE 62. It must have an acrylic coating formulated with an immobilized, EPA registered, protective agent to protect against growth of fungi and bacteria as required by ASTM C1071 and tests conducted in accordance with ASTM C 1338, ASTM G21 and ASTM G 22. It must not support microbial growth and have glass fibers bonded with a thermosetting resin. The airstream surface must be protected with a reinforced coating with flexible glass cloth reinforcement. The liner must have a reinforced factory applied edge coating and operate in an environment of a maximum of 250°F and maximum of 6,000 fpm air velocity. Thermal conductivity per ASTM C-518, at its rated thickness, must be not less than k=0.16 BTU·in/(hr·ft²·°F) and R=6.3 at 75 F mean temperature in accordance with ASTM C18. Sound absorption coefficients for the liner must be per ASTM C 423 and ASTM E

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795 test methods and the table below. **Furnish sound characteristics for review with the material submittal.**

Sound Absorption Coefficient at Frequency

Thickness (In)	(Cycles per Second) 125	250	500	1000	2000	4000	NRC
1.5	0.10	0.47	0.85	1.01	1.02	0.99	0.80
2.0	0.25	0.66	1.00	1.05	1.02	1.01	0.95

9.3. **Manufacturer:** Must be Johns Manville Linacoustic RC or equivalent material by Schuller, Knauf, Pittsburgh, CSG, Owens Corning or CertainTeed.

9.4. **Thickness:** 1.5 inches thickness. Return air platforms/plenums, relief air and transfer air (jumper and ATD) ducts 2.0" thickness.

9.5. **Ducts and Equipment to be Insulated Internally:** Exposed supply air, exposed return air and exposed outside air ducts in areas without ceilings that are not specified as factory fabricated and insulated double wall duct and fittings, return air plenums/platforms, transfer air (jumper and ATD) ducts, all ducts downstream of VAV terminal units and relief air ducts. Do not install internal duct liner within 24" of the entering or leaving side of an electric duct heater. Refer to Part Duct Insulation Work (External) for requirements.

9.6. **Acoustical Duct Lining:** Line the first ten (10) linear feet of all single wall, supply air, return air and outside air ducts downstream of all heat pumps, furnaces, air handling units, packaged units, 100% outside air units, make-up air units, storm shelter supply air fans discharge ducts, all ducts downstream of VAV terminal units, classroom or shop area exhaust ducts interlocked with lighting circuits and transfer air (jumper and ATD) ducts with insulation equal to Johns Manville Linacoustic RC and **2.0" thickness.** Sound absorption characteristics must be as specified above.

9.7. **Application:** Sheet metal duct must be clean, dry and tightly sealed at all joints and seams before applying duct installation. Installation must be in strict accordance with the Manufacturers recommendations and these specifications. Adhere insulation to sheet metal with a brush or roller in manufacturer recommended workable sections with a water based, LEED compliant, low VOC liquid, not spray, insulation bonding adhesive. Adhere insulation to the manufacturer's recommended workable section of the sheet metal surface prior to breaking the sheet metal. Cutting of the insulation and then adhering the insulation to the sheet metal is prohibited. Insulation joints must be straight and smooth and must be buttered with the specified adhesive to prevent erosion and improve airflow. The product must have a factory applied edge coating to assure sealing of transverse edges per current SMACNA and NAIMA installation standards. Secure all insulation on ducts wider than 23 inches with washers or stud pins and clips 16 inches on center, each way.

The liquid adhesive must be a premium, water-based, brush/roller applicable adhesive designed for bonding fibrous insulation (e.g., fiberglass duct liner) to the interior of HVAC ductwork. It must be UL-723, ASTM E-84, NFPA 90A and 90B, LEED and ASTM C916 compliant, low VOC, moisture and mildew-resistant with suitability for high-humidity environments.

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Sealing exposed potions of the insulation joints and damage to the liner must be repaired using the specified adhesive products following recommendations provided by the Manufacturer of the adhesive.

Adhesive must be Design Polymerics DP 2502 Duct Liner and Insulation Adhesive, Childers Chil-Quik CP-127 or Foster Quick-Tack 85-60 Duct Liner Adhesive.

9.8. **Metal Nosings: All exposed leading and trailing edges must be secured with sheet metal nosings to protect insulation edges**. Metal nosings must be securely installed over all transversely oriented liner edges facing the airstream at forward and rear discharge towards coils, dampers, ducts, plenums, changes of insulation thicknesses of adjoining insulation, any exposed insulation ends and at any point where lined duct is preceded by unlined duct. See detail on the plans. All remaining miscellaneous exposed edges must be sealed/coated. There must be no exposed fiberglass insulation.

PART 10. REGISTERS, GRILLES AND DIFFUSERS

10.1. **General:** All grilles, registers and diffusers must be product of a single Manufacturer with baked enamel finish and standard **or** custom color as selected by the Architect. Architect may require painting of the diffusers, grilles, registers, etc., in the field. Where field painting is required, diffusers, grilles and registers must be factory primed for painting in the field. Refer to Architectural Section “Painting”, coordinate requirements and provide finish as required.

Where lay-in ceilings occur, all specified items must have integral 2’ x 2’ or 2’ x 4’ aluminum modular lay-in ceiling panel with finish to match diffuser. Refer to Architectural reflected ceiling plan, check ceiling suspension system, wall and ceiling finishes and provide for proper interface as required.

All ceiling grilles, registers and diffusers not in integral lay-in metal panels and installed in gypsum board or other hard surfaces must be mounted with aluminum-countersunk screws with finish to match respective items.

Where ceiling mounted devices are installed in hard ceilings, provide appropriate trim ring as required such that screws are not visible in the face of the device. Flat countersunk screws are only allowed when concealing them is not an option.

All ceiling diffusers, ceiling return air registers and grilles, ceiling exhaust grilles and registers, and ceiling mounted relief air grilles back panels must be insulated with 1” thickness, foil backed insulation and securely attached. Contractor has the option of insulating manually or furnishing the item with factory furnished insulation from the item Manufacturer. Factory provided insulation must be attached as shown on the plan details.

All grilles, registers and diffusers must be ADC or approved equivalent Agency certified.

10.2. **Square and Rectangular Neck Ceiling Diffusers:** Titus Model TDCA-AA 6-95-125-25, Price Model AMDA-6-3LAL, removable core type, extruded aluminum construction, with baked enamel standard or custom finish color selected by the Architect, designed for one, two, three and four-way diffusion as indicated on plans, complete with AG-95 aluminum opposed blade damper, AG-125 Dua-Trol and adjustable vanes.

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10.3. **Wall Supply Air Registers:** Titus Model 300 FS-5-D-65, Price 620DAL-F-S-D-A-SW all aluminum adjustable 4-way deflection type. Provide with AG 35B aluminum opposed blade damper with worm gear, Allen Key operators and AG-225 extractors with No. 1 operator, auxiliary mounting frame for all 48” or less in size, with baked enamel standard or custom finish color selected by the Architect.

10.4. **Wall Supply Air Grilles:** Titus Model 300 FS-0-D-65, Price 620DAL-F-S-D-A-SW same as wall supply air registers, except without dampers.

10.5. **Wall Return Air and Wall Exhaust Air Registers:** Titus Model 33R-PF, Price Model 91-L-D-A-VCS3 gymnasium heavy duty steel register with 38 degree deflection 14 ga. blades, support bars on 6” centers, Allen key operated aluminum opposed blade damper and auxiliary mounting frame for all 48” or less in size, with baked enamel standard or custom finish color selected by the Architect.

10.6. **Ceiling Mounted Exhaust Air and Return Air Registers:** Titus Model 50-F-0-5-D-25, Price Model 80DAL-F-SW-A all-aluminum fabricated egg-crate type, Allen key operated aluminum opposed blade damper and lay-in type frame with baked enamel standard or custom finish color selected by the Architect.

10.7. **Ceiling Mounted Return Air or Relief Air Grilles and Air Transfer (Jumper Duct) Grilles:** Same as return air registers except without dampers.

10.8. **Gravity Backdraft and Relief Dampers:** Backdraft dampers must be constructed for horizontal or vertical mounting as shown on the plans. Backdraft dampers must be tested and rated for the required application in accordance with AMCA 500-D. Dampers must be heavy duty backdraft dampers with .125” wall thickness 6063T6 extruded aluminum with 12 gage galvanized steel structural brace at each corner. The blades must have .070” wall thickness, 6063T6 extruded aluminum with extruded vinyl blade edge seals mechanically locked into blade edge. Adhesive or clip on type seals are unacceptable. Bearings must be corrosion resistant, long life synthetic type. Linkage must be 1/2” wide tie bar connected to stainless steel pivot pins. Damper must be provided with an adjustable counterbalancing weight(s) to allow operation of the blades such that "start to open" occurs at 0.02” w.g. and the damper achieving the fully open position at 0.05" w.g. The manufacturer must be Ruskin CBD-6, or equivalent by United Enertech CB-601, Greenheck Series EM, Nailor 1380-CB or Pottorff CD.

PART 11. CONDENSATE DRAINAGE PIPING

11.1. **General:** Cut accurately to measurements established at site and work into place without springing or forcing, properly clearing all building features. Arrange and install piping systems sizes as shown, as close as practical, straight, properly supported and run as directly as possible forming right angles or running parallel with building lines, true to line and grade, free of sags and bends. Locate piping as high as practical and in parallel groups as close together as practical. Route through previously built-in sleeves and avoid cutting or other weakening of the structure. Ream all pipes to remove burs. Make changes in direction and size with fittings. Bushings are prohibited. Vent the high points of all forced water mains and branches with automatic vents discharged properly to waste. Cap or plug open pipe ends during installation to keep out foreign material.

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Before installation, piping must be checked, upended, swabbed, and all rust and dirt from storage or from lying on the ground must be removed. Any rusted piping must have the rust removed, etched as required by the manufacturer, primed and then painted with two coats of compatible, black, enamel rustproof paint. Painting must comply with the requirements of ASTM E84 for flame spread and smoke development. **All piping must be clean when it is installed.**

Take off branches from supply and return mains as shown. Make connections carefully to ensure unrestricted circulation, eliminate air pockets, and to permit complete drainage of the systems. Grade all piping not less than 1" in 40 feet. Unless otherwise specified herein, all pipefittings must be designed for 150 psig working pressure.

All piping not in an accessible attic or similar spaces that contain valves and other items which may require maintenance access must be located no more than 12” above the finished ceiling and no more than 14’-0” in areas without ceilings.

Make all connections to equipment using screwed unions in sizes 2" and smaller and flanged unions in sizes 2-1/2" and larger. Install unions in all piping connections to each piece of equipment, including traps, pumps, coils, etc. **Per IMC 307.2.5, condensate drain lines must be configured to permit the clearing of blockages and performance of maintenance without requiring the drain line to be cut.** Refer to plan details for detailed requirements of the assembly.

Unless otherwise specified, pipe and fittings installation must conform to the requirements of ANSI B31.1.

All piping must be concealed within walls, chases, above ceilings, etc., unless specifically noted otherwise.

11.2. **Condensate Drain Piping and Drain Piping from All Drain Pans to Floor Drains; Hub Drains and Other Miscellaneous Condensate Receivers:** Interior condensate drainage piping material must be Schedule 40 galvanized steel with galvanized screwed fittings or Type L hard copper tubing with wrot copper solder joint fittings with 45° or 90° offset fittings. **ProPress or similar type fittings/joints are not allowed.**

Outdoor condensate drainage piping must be Schedule 80 solid wall PVC pipe conforming to ASTM Standard D1785. Schedule 80 fittings must be injection mold and must conform to ASTM D 2464. Pipe and fittings must be manufactured from virgin rigid PVC (polyvinyl chloride) vinyl compounds with a cell class of 12454 as identified in ASTM D 1784. PVC Schedule 80 pipe must be Iron Pipe Size (IPS) conforming to ASTM D 1785. Injection molded PVC Schedule 80 fittings must conform to ASTM D 2467. PVC Schedule 80 threaded fittings, where specified, must conform to ASTM D 2464. Pipe and fittings must be manufactured as a system and be the product of one manufacturer. All pipe and fittings must conform to NSF International Standard 61 and the health effects portion of NSF Standard 14. Installation must comply with the latest installation instructions published by the piping manufacturer and must conform to all applicable plumbing, fire, and building code requirements. Solvent cement joints must be made in a two-step process with a primer meeting ASTM F 656 and a medium- or heavy-bodied solvent cement conforming to ASTM D 2564. The system must be protected from chemical agents, fire-stopping materials, thread sealant, plasticized vinyl products or other aggressive chemical agents not compatible with PVC compounds. The system must be hydrostatically tested after installation as specified hereinbefore. All Schedule 80

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piping and fittings must have factory applied UV protective coating and tested for sunlight resistance according to UL 651 requirements.

Condensate piping from condensing furnaces combustion chamber to the specified acid neutralizing device must be Schedule 80 CPVC piping. Condensate piping from discharge of the acid neutralizing device to the drain must be Type L hard copper tubing with wrot copper solder joint fittings as specified.

CPVC pipe must be manufactured from virgin rigid CPVC (chlorinated polyvinyl chloride) vinyl compounds with a cell class of 24448, as identified in ASTM D 1784. CPVC Schedule 80 pipe must be Iron Pipe Size (IPS) conforming to ASTM F 441. Pipe must conform to NSF International Standard 61 and 14.

CPVC piping installation must comply with the latest installation instructions published by piping manufacturer and must conform to all applicable plumbing, fire, and building code requirements. Solvent cement joints must be made in a two-step process with primer conforming to ASTM F 656 and solvent cement conforming to ASTM F 493. The system must be protected from chemical agents, fire-stopping materials, thread sealant, plasticized-vinyl products or other aggressive chemical agents not compatible with CPVC compounds. The system must be hydrostatically tested after installation as specified hereinbefore.

All cooling coils and evaporator coils horizontal condensate drainage piping must be sloped a minimum of 1/8” per foot. The condensate drain line size must be full size of unit condensate outlet and in no case, less than 3/4 inch.

The condensate drainage assembly must be made up of materials specified above. The assembly must consist of p-trap, unions, air bleeder/open vent with 1/8” screen over open portion, etc., as required by the equipment Manufacturer. **Running p-traps are not allowed.**

Ductless mini-split equipment that produces condensate shall be provided with an inline check valve located in the drain line or a trap as required by IMC 307.2.4.1.

In absence of the Manufacturer’s requirements, condensate drainage assembly must be as shown on the plans. **Per IMC 307.2.5, condensate drain lines must be configured to permit the clearing of blockages and performance of maintenance without requiring the drain line to be cut.** Refer to the details on the plans and the requirements below for unions required in the condensate piping.

Install a UL 508 and UL 2043 (as applicable) conforming electric switch in the secondary drain line of each condensate producing piece of equipment. The switch must automatically shut off the equipment served in the event the primary drain line becomes restricted. If a Building Automation System (BAS) is part of the project, the electric switch must also alarm to the BAS operator console. Coordinate the requirement with the BAS Contractor and provide as required.

11.3. **Copper Joints:** Make assemblies with tin-antimony (95-5) solder and non-corrosive flux (this does not apply to refrigerant piping). Clean and polish the tube and the inside of the fittings, using No. 60 steel wool. Apply flux and place fitting on the tube. Heat joint evenly but take care not to overheat fitting. Apply solder until a solder line shows completely around the joint. Remove surplus solder and allow joint to cool. **ProPress or similar type fittings/joints are not allowed.**

11.4. **Escutcheons:** Where pipes pass through cabinets, walls and ceilings of finished

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rooms provide one-piece, cast-brass type with polished, chrome-plated finish and setscrew fastener or stainless steel type securely fastened in place. Pack penetrations with mineral wool insulation, seal with firestopping compound and install escutcheons to prevent passage of fire, smoke and vermin. Do not use split ring type escutcheons.

11.5. **Unions:** Provide adjacent to all valves (one side) and mechanical equipment. Provide companion flanges on all flanged valves, pumps, and other mechanical equipment. Unions must be of the following types:

Black Steel Lines: 2" and under - 150-pound ground joint malleable. 2-1/2" and over - 150 pound flange and gasket type, malleable.

Copper Lines: Ground joint, copper to copper.

Schedule 80 PVC: Solid wall PVC schedule 80 DWV pipe and fittings as specified hereinbefore.

Dielectric Unions: Provide where copper pipe joins to steel pipe, EPCO or approved equivalent. Contractor must provide a globe valve on each side of each dielectric union to allow for replacement of the union.

Gaskets for flanged joints: Best grade compressed material approved for the temperature and pressure of the system.

11.6. **Expansion:** Provide for expansion and contraction of all piping and make proper provisions so that there must be no undue strain on any pipe or equipment.

11.7. **Sleeves:** Refer to Section 15010, Pipe Sleeves.

PART 12. VENTILATION

12.1. **General:** All fans must be furnished completely with ducts, grilles, curbs and required accessories. All fans exhausting shower/bath/tub/dishwashing areas and similar moisture laden areas must be provided with aluminum wheels. All other fan wheels must be steel. No plastic or non-metallic wheels are allowed unless specified otherwise.

All roof mounted fans, curbs and related assemblies must be tested and certified by an independent, recognized third party testing agency and must comply with all three Miami-Dade test protocols for static loading, missile impact and cyclic loading. Each roof mounted fan must bear a permanent label with the manufacturer's name or logo, manufacturing address, model number, the positive and negative design pressure rating, **indicate impact rated, installation instruction drawing reference number, approval number (NOA), the applicable test standards, and the statement, 'Miami-Dade County Product Control Approved' must be located on the fan housing. Installation must be as required by the Manufacturer to comply with the aforementioned test protocols.**

All roof curbs, etc., furnished must adhere to the roofing Manufacturer's requirements so as not to void the roofing warranty. The top of all roof curbs must be level with pitch built into curb when deck slopes 3/8 of an inch per foot or more. Coordinate with architectural and structural plans for required slope. Coordinate the roof curb and

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interface in the building roofing system and verify minimum net height to be as required by Code or as required by Architect. Refer to architectural specification.

Furnish sound absorbing curbs required to obtain noise levels specified. Curbs must be insulated with minimum R=8 rigid insulation with galvanized covering with continuous welded joints. See Part “Vibration and Noise Control” for additional requirements.

Provide for all fans to be interlocked with air handling units a “hand” – “auto” – “off” switch.

All fans must be certified in accordance with AMCA/ANSI Standards 210 and ANSI/ASHRAE 51. Fans wheels must be balanced in accordance with AMCA Standard 204-05. Fans must be listed at UL 705 and must bear the UL Label. Furnish for review capacity and sound power ratings.

All motors 1/2 HP and smaller must have built-in overload protection.

All motors with scheduled capacity of less than 1 HP must be ECM type as required by ASHRAE 90.1 and with minimum motor efficiency of 70% when rated in accordance with DOE 10 CFR 431.

All belt driven fans must have v-belt drive sized for 150% of the installed motor horsepower, adjustable pitch cast iron sleeves for motor and adjustable motor base.

All motors must also be premium efficiency type. Refer to Section Motors for additional requirements.

Scheduled static pressures are external to sound curbs.

Through the curb/base wiring is not allowed.

Where fans are specified as 277 Volts to properly interface with 277 Volts lighting power, the Mechanical Contractor must furnish and install required relays, etc., as required for proper interface.

12.2. **Power:** Contractor must verify all voltage and power requirements with Electrical Contractor, Electrical plans and at the site, prior to ordering equipment.

12.3. **Variable Frequency/Speed Drives:** Where shown, specified or required to be a part of a new or existing HVAC Controls System (BAS), variable frequency drives must be equipped with integral disconnect switch and a serial interface to allow bidirectional communication with the existing or new BAS. At a minimum, the following points must be made available to the controls system: Set Point, Drive Speed (RPM), Frequency (Hz), Current (A), Power (KW), Energy (KWH), Last Fault Number, OK/Faulted Status, Stop/Run Status, and Hand/Off/Auto Status. Drives must be installed in accordance with NEC requirements for electrical panels. Drives enclosure must be a minimum of NEMA 4x for outdoor installation and NEMA 12 for indoor locations unless specified otherwise. Refer to Part Automatic Controls at end of 15700 or Section 15920, Heating, Ventilating and Air Conditioning Building Automation System (BAS), as applicable, for additional requirements.

Variable Frequency/Speed Drives must be manufactured by Danfoss A/S, ABB Group, Siemens AG, Schneider Electric, Rockwell Automation, Yaskawa Electric Corporation, Emerson Electric, Fuji Electric, Invertek Drives Ltd or Eaton Corporation.

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12.4. **Ceiling Mounted Cabinet Fans:** Penn Ventilator Company Model Zephyr, Series Z-3H thru Z-15H with RA right angle arrangement or TDA arrangement as shown on the plans, or approved equivalent, complete with all accessories, including unit mounted solid state speed control switch, factory baked enamel white metal ceiling grille, metal flanged inlet and outlet connections, acoustically insulated metal housing, direct drive, EC motors, internally isolated centrifugal fan, integral backdraft damper and terminal cap, cast aluminum brick vent, or soffit grille as shown on the plans. Fan wheel must be steel or aluminum. No polypropylene, plastic or other non-metallic wheels. Fan must be supported from the structure with 1/4" hanger rods, rubber in shear vibration isolators and Manufacturer furnished bracket for attaching rods to the fan and structure above. Refer to the plan details for additional requirements.

12.5. **Wall Mounted Propeller Type Fans:** Wall propeller type with minimum capacities and characteristics as shown. Each unit must include standard NEMA design, heavy duty sealed permanently lubricated ball bearing induction type, premium efficiency motor, drip proof motor, adjustable motor mount, permanently lubricated pillow block type ball bearings, motor operated heavy duty extruded aluminum opposed blade damper, equal to Ruskin Series CD-50 and drainable blade type wall louver, equal to Airolite Louvers, Inc. Model No. K6744 with flanged frame, 1/2" aluminum bird screen and color by Architect. Submit louver to Architect for review. Coordinate louver requirements with Architectural specifications prior to ordering. Provide motor side fan guards, fan wall housing collar and variable pitch belt drive. Motor for discharge louvers must be designed for the same power as fan motor. Where required provide transformer and control wiring for a complete and functional installation. All items must be readily accessible for service and maintenance. Furnish for review complete installation Shop Drawings. Belt-driven fans must be equivalent to Loren-Cook Series XL/XM-W, XMPH heavy duty. Direct driven fans must be equivalent to Loren-cook Series XWD-EC (VF). See Fan Schedule for type required.

12.6. **Wall Centrifugal Exhaust Fans:** Fans must be hinged, centrifugal power roof/wall ventilators with AMCA certified air and sound ratings with premium efficiency motors. Fans must be direct driven as shown and must have permanently lubricated and sealed flanged bearings rated for L50 life in excess of 200,000 hours at maximum cataloged operating speed. All aluminum wheels statically and dynamically balanced backward curved blade wheels and spun aluminum housing with curb cap; disconnect switches, backdraft damper and outlet bird screen. For each fan, furnish an 18-gauge galvanized steel insulated prefabricated curb with integral cant and continuous welded joints. Fans must be equal to Cook Series ACWC-EC.

12.7. **Acceptable Manufacturers:** Cook, Greenheck, Penn Barry. Cook is the basis of design.

PART 13. SPLIT SYSTEM HEAT PUMP UNITS (HP)

13.1. **General:** Furnish and install split system heat pump systems manufactured by the Trane Company. All equipment (condenser/compressors) scheduled cooling capacities are based on 95°F ambient temperature. Indoor units with scheduled cooling capacity of 60 MBH or less must be Trane Series GAM5. Related outdoor units with scheduled cooling capacity of 60 MBH or less must be Trane Series 4TWA4. Indoor units with scheduled cooling capacities greater than or equal to 72 MBH must be Trane Odyssey Series TWE. Related outdoor units with scheduled cooling capacities greater than or equal to 72 MBH must be Trane series TWA. **For**

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240/208V, single phase ONLY outdoor units, use this outdoor unit which is a variable speed inverter compressor. Related outdoor unit must be Trane Series ComfortSeek, Model 5TWR7. Equivalent units/systems by Carrier or Lennox will be considered. Trane is the basis of design.

Each unit must be completely factory assembled and tested and must include hermetic compressor, factory installed refrigerant monitors and related safeties, outdoor condenser coil, indoor evaporator coil, primary and secondary condensate drainage stub outs, fan and high static, premium efficiency ECM motor drives (Series GAM5) or belt driven, premium efficiency motor with variable pitch pulley, high static drive and permanently lubricated ball bearing motor (Series TWE), interconnecting wiring, low voltage control transformer, prewired control panel, condensate drip kit (as required) and other necessary components mounted in weather resistant steel or polymer cabinet with baked on enamel finish.

External static pressure indicated on the plans is estimated. The equipment Manufacturer must provide additional belt sheaves for all belt driven equipment and/or motors or drives for ECM motors as applicable and as required, to match field conditions for the ductwork as installed.

The unit must be UL or ARL (Applied Research Labs) listed and labeled accordingly. The heat pump must be sound rated by ARI Standard 270 and the operation sound level must not exceed acceptable limits. Heating and cooling capacities must not be less than those indicated on the drawings. Indoor unit must be provided with single point power connections (fan and heater). **The Contractor must verify all voltage and power requirements with the Electrical Contractor, Electrical plans and at the project site, prior to ordering equipment.**

Each unit must be provided with sweat/brazed connections from the Manufacturer's factory. Flare connections are not allowed unless **specifically** required by the Manufacturer.

13.2. **Special Requirements:** The Equipment Manufacturer must size all refrigerant piping per ASME B31.5 (Refrigeration Piping and Heat Transfer Components), ASHRAE Standard 15 (Safety Standard for Refrigeration Systems) and all applicable codes and standards. The Manufacturer and Contractor must furnish all required accessories and auxiliaries for a complete installation in accordance with the drawings and specified sequence of operation. The Contractor must submit a manufacturer approved refrigerant piping diagram prior to installation. Failure to provide the approved diagram must make the Manufacturer and Contractor solely responsible for correcting any resulting issues at no additional cost to the Owner. Refer to Section Refrigerant Piping and Accessories for additional requirements.

13.3. **Refrigerant Leak Detection System (LDS):** A Leak Detection System (LDS) and Mitigation Control Board (MCB) must be provided in any system that has more than 3.91 lbs. of an A2L refrigerant charge per safety standard UL 60335-2-40 which consists of one or more refrigerant detection sensors. Equipment with R-454B and charge amounts less than or equal to 3.91 lbs. per circuit do not require a refrigerant leak detection system or any circulation airflow or ventilation airflow mitigation strategies. **The LDS must be factory-installed for all units.**

When the LDS detects a leak in units with charge amounts greater than 3.91 lbs. per circuit, the following mitigation actions must be automatically initiated until the refrigerant has not been detected for at least 5 minutes:

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a. The compressor(s) operation must automatically and instantly cease/shutdown.
b. Associated auxiliary electric heat must be instantly and automatically disabled.
c. The supply air fan must continue to run.

13.4. **Testing of Refrigerant Leak Detection System:** The Alabama Department of Construction Management (DCM) requires that the unit manufacturer must provide a factory-trained mechanic, employed by the unit Manufacturer, not a sales representative, onsite the day of the final site visit to test the refrigerant monitoring system and verify proper operation, shutdown, safeties, etc. as required. No beneficial occupancy, substantial completion or certificate of occupancy will be granted by DCM without this testing. Failure to comply with this provision will be cause for cancellation of the site visit and a reinspection fee imposed, with all costs of the re-inspection to be borne by the Contractor.

13.5. **Condensing Unit Cabinet:** Must be heavy gauge galvanized steel cabinet with weather resistant baked enamel finish. Access to the electrical controls and compressor must be made by removing two service panels. All equipment must be installed level and plumb.

13.6. **Compressor System:** The unit must contain a hermetic compressor. The compressor must have high and low pressure protection, sump heat, compressor overload protection, 24-volt control transformer and magnetic contactors. Refrigerant circuit must include service valves, pressure tap ports, check valves, switch over valve, refrigerant line filter-driers and full factory furnished charge of ASHRAE Safety Classification A2L, R-454B refrigerant.

All units with scheduled cooling capacity greater than 60 MBH must be provided with multiple compressors, or 2-stage compressors as required by ASHRAE 90.1. Units with more than one compressor must have complete separate/independent refrigerant circuits to the evaporator. Where dual compressors are required for Manufacturer approved use of the hot gas reheat coil, dual compressors must be provided in lieu of a single, two-stage compressor.

13.7. **Refrigerant Service Valves:** Provide for the proper service of the equipment. Per IMC 1101.9, all refrigerant circuit access ports located outdoors must be fitted with color coded, all brass and locking tamper resistant caps. This requirement does not apply to refrigerant circuit access ports on equipment installed in controlled areas such as on roofs with locked access hatches or doors.

The locking caps must be red or red banded color code for the refrigerant used. Caps must be Novent Series 8668 for R-454B refrigerant with 86698 NV Multikey unlocking mechanism for R-454B refrigerant or equivalent by JB Industries Series Shield and DiversiTech Series Sentry. Provide Owner with minimum of six (6) spare keys.

13.8. **Outdoor Coil:** The outdoor coils must be constructed of aluminum fins or Spine Fin mechanically bonded to seamless aluminum or copper tube and must be protected by a unit Manufacturer furnished, heavy-duty metal hail guard. The outdoor coil must have expansion valve refrigerant control during heating operation and automatic time and temperature actuated defrost control system. Unit must, as factory shipped, cycle fan motor on outdoor thermostat for low ambient cooling down to 40°F outdoor temperature. Provide heavy-duty metal condenser coil hail guard.

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13.9. **Controls:** Indoor units must be provided with programmable touch screen panel. Controls must be factory wired and readily accessible.

13.10. **Air Handler:** Air handler must be a heavy duty polymer (1-ton through 5-tons) and heavy gauge galvanized steel cabinet with weather resistant baked enamel finish for all other units. The air handler cabinet must be internally lined with foil laced fiberglass insulation. The indoor coil must be constructed of aluminum plate fins mechanically bonded to seamless copper tubes. The indoor (evaporator) coil must have expansion valve control and be equipped with defrost control and provided with stainless steel drain pan. Refrigerant piping connections must be sweat/brazed connections from the Manufacturer's factory. Flare connections are not allowed unless **specifically** required by the Manufacturer. The air handler must be provided with a low voltage terminal board and fan motor relay.

13.11. **Supply Fan and Motor(s):** Capacity not less than shown when operating against the static pressure indicated. All blower motors and bearings must be resiliently mounted and the entire motor and blower wheel assembly must then be mounted on approved sound absorbing material and must be practically noise-less in operation. Motors must be constant torque, premium efficiency ECM type with soft start/stop. Blower motor current characteristics must be as shown on the plans. The blower door must be provided with a safety switch to stop the fan when the door is opened.

All motor ratings, efficiencies, torque, horsepower, service factor, temperature rise, bearing life and performance characteristics specified herein must be fully achieved at a base frequency of 60 Hz or lower. Motors must not rely on operation above 60 Hz to meet any specified performance criteria, nor shall the capability to operate above 60 Hz be used to satisfy the minimum requirements of this Section.

External static pressure indicated on the plans is estimated. The equipment Manufacturer must provide additional belt sheaves for all belt driven equipment and/or motors, as applicable and as required, to match field conditions for the ductwork as installed.

13.12. **Auxiliary Electric Heater:** Provide electric heater with a total heating output not less than indicated on the drawings. Heater assembly must include power supply fusing, automatic resetting limit switches and heat limiters for thermal protection. Heater must be provided with factory disconnect switch and fusing all per National Electrical Code and UL. The auxiliary heater cabinet must be factory-sealed air tight and insulated to prevent condensation.

Units with a specified cooling capacity of less than 40 MBH must use the auxiliary resistance heater for reheat. Where the auxiliary resistance heater is specified for maintaining space temperature during dehumidification, the auxiliary resistance heater must be provided in a minimum of two stages.

13.13. **Indoor Thermostat:** The manufacturer must provide a combination 7-day programmable, two-stage heating automatic changeover heat pump thermostat. The thermostat must have outdoor thermistor to compensate for thermostat droop, emergency heat switch with indicator light and auxiliary heat light. Thermostat must have sub-base fan switch for "On-Auto" selection and manual "Heat-Cool" switch. The thermostat must be hardwired and be provided with battery backup. Coordinate the thermostat with specified sequence of operation and provide as required.

Provide hinged metal guard with rounded corners, lock and key for each thermostat.

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Refer to Section 15920 Building HVAC Controls System (BAS) for additional requirements.

13.14. **Outdoor Thermostat:** Provide a mounting box and one outdoor thermostat for control of second stage of electrical heaters.

13.15. **Humidistat:** Humidistat is specified in “Automatic Controls” at the end of this 15700 Specification. At his option, the Unit Manufacturer may substitute a combined thermostat/humidistat. Verify with the Controls Sub-Contractor that the furnished thermostat/humidistat will perform all sequences of operation else provide separate devices as specified.

13.16. **Power Wiring:** Unit must be factory wired for power supply indicated on the electrical drawings. Any variation must be the responsibility of the Contractor.

13.17. **Filter Frame and Filters:** Provide 2" thick, MERV 11, pleated filters equal to 30/30/ Farr Series. All filters must be common industry standard size filters that are readily available and do not have to be fabricated. Cutting and taping of filter segments to make a proper filter is prohibited. Where the indoor section sits on R.A. platform or is horizontally mounted in an attic space and the Manufacturer does not provide filter access with thumbscrew access in the bottom of the unit, provide a filter frame that is designed to mount to the bottom (R.A. inlet) of the air unit. Frame must be hinged and have thumbscrews or wing nuts to open the access door. The filter frame must be 22 gauge metal as manufactured by E-Z Filter Base Mfg., Inc., The Metal Shop, McDaniel Metals, approved equivalent or shop fabricated meeting the requirements as specified above. **The Mechanical Contractor must be responsible for quarterly filter changes during the guarantee period and must inscribe onto the filters’ casing the date filters were installed/replaced.**

13.18. **Unit Protection:** All equipment must also be provided with equipment manufacturer factory installed surge protection and phase protection to insure against voltage unbalance, over/under voltage, phase loss, reversal, incorrect sequencing and rapid short cycling. Where manufacturer factory installed devices are not available, protection must be provided for all 3-phase equipment utilizing ICM Controls Model 450 A Plus+ or equivalent. All single phase equipment with horsepower greater than or equal to 1/8 HP must be provided with protection utilizing ICM Controls Model ICM 492 or equivalent. Where phase protection device cannot be mounted within the respective equipment, provide a NEMA 4x or NEMA enclosure appropriate for the installation. The Contractor must consult with the Owner's maintenance personnel and set up all programmable options based on the Owner's requirements, within the device's capabilities.

13.19. **Roof/Pad Mounted Supports:** Refer to Part Vibration and Noise Control for roof mounted equipment requirements. All items furnished must adhere to roofing Manufacturer’s requirements so as not to void the roofing warranty. Coordinate with architectural and structural plans for required slope. Coordinate the roof curb and interface in the building roofing system and verify minimum net height to be as required by Code and Architect. All roof-mounted equipment must be designed by the Manufacturer and installed by the Contractor to withstand the minimum wind loads prescribed in IBC Section 1609 and IMC 301.12. Coordinate all requirements with the Structural Engineer prior to installation. Refer to the plan details. Where units are shown to be located on the roof, do not route power through the curb. Coordinate requirement with the electrical plans and electrical Contractor and provide as specified.

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Units shown on finished grade must be anchored to the concrete pad. Concrete pads are specified under Division 2. Where concrete pads are not specified or not shown elsewhere, the Mechanical Contractor must provide a minimum 4” thickness, 5,000-psi concrete pad with rounded edges and corners. Pad must extend a minimum of 12” around three (3) sides of the unit and terminate at the building outside wall. Provide a strip of asphalt expansion joint between the concrete pad and the building exterior wall. Expansion joint must be full width by full depth of concrete pad, 1” thickness, non-absorbing, self-sealing, ASTM D 994 compliant and manufactured by W.R. Meadows Inc. or approved equivalent.

13.20. **Warranty:** General warranties are specified in Section "General Mechanical Provisions". The Mechanical Contractor and equipment Manufacturer must provide a non-prorated, total of five years replacement warranty for this equipment, to include all parts and components, belts, lubricants, compressors, refrigerant, etc., all labor and shipping of the items required to return the installation to its original operating condition.

The Mechanical Contractor must be responsible for any parts, labor, etc. as specified above that is not provided by the equipment Manufacturer.

The Contractor and/or the Manufacturer must respond within 24 hours upon notification that there has been a failure under the terms of the specified warranty. "Respond" must mean having a Manufacturer certified technician onsite to evaluate the extent of the needed repairs/replacement and ordering of all items required for repair/replacement.

Shipping of the replacement compressor and any other related unit parts must be via maximum 2-day delivery if the unit is inoperable or cannot maintain a minimum indoor temperature of 78ºF to the affected facility.

The warranty period must begin on the date of substantial completion of the installation, as determined by the Architect and must continue for the full product warranty period specified above.

PART 14. ELECTRIC UNIT HEATERS

14.1. **General:** Heaters must be UL listed, have integral safety controls, control transformer, circuit breaker and all required accessories for a complete and functional installation. Capacities must be as scheduled on the plans. All heaters must be installed in accordance with the Manufacturer’s recommendations.

Heaters must be securely mounted to building structure. Provide any additional structural framing necessary for proper heater installation. Unit heaters must be provided with single point power connections (fan and heater).

The contractor must verify all voltage and power requirements with the Electrical Contractor, Electrical plans, and at the project site, prior to ordering equipment.

See below for the basis of design units. Equivalents by Trane, Reznor, Modine, Markel, Chromalox or Indeeco will be considered.

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14.2. **Propeller Type:** Heater must be horizontal (vertical) discharge type, complete with integral controls, remote 24-volt thermostat, control transformer, and circuit breaker. The Basis of design is Trane model UHEC.

PART 15. AUTOMATIC CONTROLS

15.1. **General:** Furnish and install a complete system of automatic temperature controls, as specified herein, as shown on the Drawings and as required for a complete installation. All temperature control equipment must be of electric type. All specified Sequences of Operation are subject to all equipment built-in safety requirements. Equipment and safety requirements must not be overridden.

15.2. **Submittals:** The temperature control contractor must submit a complete set of temperature control diagrams with written "sequence of operation" and factory-printed specification data sheets covering each control device proposed to be used for Engineer's review prior to installation of any equipment or part of system. Submittal data must include a schedule of all devices to be installed.

15.3. **Installation:** By trained and experienced mechanics. All work must be done by an approved, independent HVAC Controls Contractor whose primary business is the installation and servicing of HVAC controls systems. The HVAC Controls Sub-Contractor must have an adequate service facility to provide complete service and maintenance of the facility within 100 miles of the installation.

15.4. **Identification:** Provide permanent nameplates for all control components and for all motor starters. Nameplates must be engraved laminated plastic with sufficiently large letters to be legible under normal operating conditions. Refer to Section 15010, Part Identification for additional requirements, nameplate materials, etc.

15.5. **Conduit, Controls Wiring and Instrumentation Cable:** The HVAC Controls Contractor must be responsible for the furnishing and installation of a complete and functional system as specified, shown on the plans and as required to accomplish the specified sequences of operation.

All HVAC control cabling and wiring must be in EMT conduit (no “whips”) or on J-hooks. Above accessible lay-in ceilings, control wiring must be installed on J-Hook assemblies. Above all hard, inaccessible ceilings, in all mechanical rooms and in areas with exposed structure (no ceilings), controls wiring must be in conduit. Do not attach any wiring, cabling or conduits to refrigerant piping.

Do not route control wiring through sleeves containing piping. Do not route control wiring through sleeves containing piping. **All control wiring penetrating any exterior wall, interior partition, floor, and similar construction must be in EMT conduit. Through base control wiring/conduit is not allowed.** EMT control conduit must be as specified in the Electrical Division of the specifications and/or as shown on electrical drawings. Minimum HVAC Controls conduit size must be 3/4” in size. All control conduit, power, relays, contactors, transformers, wiring, etc., required for a complete functional system as specified, shown on the plans, or as required to accomplish the specified sequences of operation, which is not shown or specified by the Electrical Division, must be furnished and installed by the HVAC Controls Contractor. This must include all power, interlock control wiring between the various components of the heating, ventilating and air conditioning system, lighting interlocks and all smoke detection system electrical wiring.

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Instrumentation cable must be minimum AWG as specified or heavier AWG as recommended by the controls system Manufacturer.

All thermostat and humidistat boxes must be mounted 46” A.F.F. to the center of the box (ADA height). Where wall mounted CO_2 Sensors are indicated, they must be mounted 58” A.F.F to the center of the box.

15.6. **Space Thermostats:** Space thermostats must be 7-day programmable, microprocessor based, low voltage type with “Heating - Cooling” and fan “On-Off-Auto” switches sub-base. Coordinate thermostat requirements and options with Mechanical Contractor and provide as required to accomplish specified sequence of operation. Each thermostat must have building power supply with transformer and battery back-up power.

Provide hinged metal guard with rounded corners, lock and key for each thermostat.

All thermostat boxes must be mounted 46” A.F.F. to the center of the box (ADA height). All thermostat boxes in walls or partitions must be sealed/caulked to prevent the passage of air and smoke through the device.

15.7. **Humidistats:** Heavy-duty industrial type. Provide metal guard as specified for thermostats.

All humidistat boxes must be mounted 46” A.F.F. to the center of the box (ADA height). All humidistat boxes in walls or partitions must be sealed/caulked to prevent the passage of air and smoke through the device. At his option, the unit Manufacturer/Controls Sub-Contractor may provide a combined thermostat/humidistat device. Coordinate requirement with the equipment manufacturer prior to bidding and provide as required.

15.8. **Condensate Drainage:** Refer to Part Condensate Drainage Piping of this specification for drainage requirements.

15.9. **Motorized Control Dampers:** Equal to Ruskin Series CD-50, Pottorff CD-52, Greenheck VCD-43, United Enertech CD-110 or Nailor 2020, galvanized steel frame, Class 1A (less than or equal to 3 cfm/sq.ft. at 1" w.g.) leakage, extruded aluminum airfoil, opposed blade dampers, stainless steel or synthetic bearings with heavy-duty Belimo actuator and 24-volt actuators. The dampers must be labeled by an approved agency when tested in accordance with AMCA 500D.

Coordinate power requirements with electrical contractor and provide as required. Damper motors must be located outside of the air stream. Provide weatherproof construction for outdoor installation of dampers and weatherproof enclosure.

15.10. **Typical Split System Systems or Packaged Heating and Air Conditioning Unit (PHAC) Systems Sequence of Operation:** The control circuit for each unit must be energized by its respective 7-day programmable thermostat. Occupied and unoccupied schedules must be programmed by the Controls/Mechanical Contractor as desired by the Owner.

The thermostat shall be used to control heating and cooling.

Upon a call for the occupied schedule, the outside air damper shall open to its minimum scheduled outside air setpoint, and the respective indoor/outdoor unit shall

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start. Upon respective indoor/outdoor unit shutdown, the motorized outside air damper shall close.

Upon a call for the unoccupied schedule, the outside air damper must remain closed, and the respective indoor/outdoor unit must start.

Provide a space humidistat to override the cooling thermostat to provide for dehumidification.

All units shall have capability for dehumidification..

During dehumidification the compressor shall be commanded on for cooling. The space thermostat shall then modulate the refrigerant hot gas reheat valve or electric reheat first stage as required to maintain the required space temperature.

Provide smoke detectors as specified above where shown on the plans. Wire the detectors to stop the unit upon smoke detection. Provide required interlocks, wiring, relays, etc., to stop the unit upon detection of smoke by the smoke detectors. Coordinate work with Electrical Contractor and provide all as required.

The furnaces and packaged heating and air conditioning units are specified to be provided with firestats. Firestats must be located in each main return air duct of each unit and at each wall mounted return air grille/register at return air platforms with set point 125°F (adj.). Arrange to stop supply air fan if the set point is exceeded.

Coordinate requirement with equipment Manufacturer and specified setpoint, verify installation and proper settings.

15.11. **Exhaust Fan (EF) Controls:** Where indicated provide room thermostat or wall switch to control the respective fan and intake damper operation to maintain space temperature. Also, provide interlock wiring from each exhaust fan to the respective motorized damper motor to operate damper anytime fan is started.

Provide interlocks for certain fans as noted on fan schedule, including lighting interlocks if not shown on electrical. Also, provide central HVAC control panel mounted “Hand-Off-Auto” switch for all fans that are interlocked with other equipment to function as follows: With switch in the “Auto” position fan starts with the interlocked equipment. With switch in the “Hand” position, the fan runs continuously.

Provide hinged metal guard with rounded corners, lock and key for each thermostat.

15.12. **Typical Unit Heaters:** Each unit must be started by the respective 7-day, microprocessor based, programmable thermostat. The space thermostat must control heater contactors or gas valve, as applicable, and the fan as required to maintain space temperature.

Provide hinged metal guard with rounded corners, lock and key for each thermostat.

All unit heaters must be provided with an outdoor temperature sensor on the north facing wall and wired to each unit heater to lock out the heater anytime the outdoor temperature is above 45ºF.

15.13. **Time Delay Controls:** Provide time delay control systems as required to stage units starting to prevent more than three units from starting at the same time.

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15.14. **Miscellaneous Controls:** Provide all other miscellaneous controls, wiring, dampers, valves, etc., as required for a complete functional control system.

15.15. **Service and Guarantee:** After completion of the installation, adjust all control equipment and place the complete system in operation subject to the review of the Engineer. Guarantee the control system to be free of defects and adequate to provide required control functions for a period of one year after acceptance of project. Provide free service and maintenance during the guarantee period.

15.16. **Freezestats:** Must be provided with 20 feet sensing elements responsive to the lowest temperature along the length of the element. These thermostats must be of the manual reset type and must be wired into the supply fan starter holding coil circuit and arranged to stop the fan in the event of low temperature condition and fail safe (open flow to the hot water coil).

Provide necessary sheet metal baffle plates to eliminate stratification and provide air volumes specified. Locate baffles by experimentation, affix and seal permanently in place only after stratification problem has been eliminated.

15.17. **Service and Guarantee:** After completion of the installation, adjust all control equipment and place the complete system in operation subject to the review of the Engineer. Guarantee the control system to be free of defects and adequate to provide required control functions for a period of one year after acceptance of project. Provide free service and maintenance during the guarantee period. Service, adjust and calibrate all controls one week prior to year-end site visit.

END OF SECTION

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DIVISION 16

ELECTRICAL



Prepared by Kenneth R. Gunn Jr. P.E.

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SECTION 16100
ELECTRICAL

PART 1 - GENERAL

1.01. RELATED DOCUMENTS:

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

1.02. QUALIFICATIONS OF ELECTRICAL CONTRACTORS:

A. Electrical contractor must be properly established as an electrical contractor by the State of Alabama. Electrical contractor shall have had previous experience in the satisfactory installation of at least three systems of this type and size in the State of Alabama.

1.03. CODES, PERMITS AND INSPECTIONS:

A. Comply with applicable laws of the community, with latest edition of National Electrical Code (NEC), NFC 70, and the International Building Code(IBCC) or the edition adopted by the local authority having jurisdiction, where not in conflict with those laws, and with the service rules of the local utility company.

B. Obtain and pay for all permits and deposits and arrange for inspections as required.

C. After completion of the work, submit certificate of final inspection and approval from the local electrical inspector, certifying that the installation complies with all regulations governing same.

1.04. MATERIALS:

A. All materials shall be new, and UL approved where a standard has been established.

B. Manufacturers' names and model numbers shown on the plans and in the specifications are given to indicate the type and general quality of items to be provided. Equal products by other manufacturers will be accepted.

C. Material substitutions will be considered only when evidence of equality and suitability, satisfactory to the Architect/Engineer has been presented in writing, with samples if requested by the Architect/Engineer. All prior approvals must have the approval of the engineer of record at the offices of Gunn and Associates, P.C. located at 3102 Highway 14, Millbrook, AL 36054, Phone: 334-285-1273

D. All proposed substitutions shall be approved in writing at least ten (10) days prior to the bid date.

E. It shall be understood that the Architect/Engineer has the authority to reject any material or equipment used which is not specified or approved, or showing defects of manufacture or workmanship, before or after such material or equipment is installed.

1.05. WORKMANSHIP:

A. Execute all work so as to present a neat and workmanlike appearance when completed.

1.06. DESCRIPTION OF WORK:

A. Furnish all labor and materials required to complete the electrical work indicated on the drawings or herein specified. Major work included in Section 16 shall be:

B. Prior to bid it is the contractor's responsibility to re-affirm with the power company the service requirements to the facility as indicated on the electrical drawings. If any changes or additions to the service lateral installation indicated on the drawings is required by the utility company the contractor shall include the cost of these changes in his/her bid. Additionally, any/all charges for electrical service to the facility (aid-to-construction) by the utility company shall be included in the contractor's bid price.

C. Remove or relocate all electrical or electronic services located on or crossing through the project property, either above or below grade, which would obstruct the construction of the project or conflict in any manner with the complete project or any code pertaining thereto.

D. Furnish and install a complete electrical light and power system including but not limited to the connection of all meters, switchboards, panelboards, circuit breakers, power outlets, convenience outlets, lighting fixtures, switches, and/or other equipment forming part of the electrical system.

E. Furnish and install a complete system of outlet boxes, face plates, conduit raceways, Category 6 cables, backboards, patch panels, and fiber optic cables and patch panels for the Data System.

F. Connect all electrical equipment whether furnished by this contractor or by others.

G. Furnish and install all disconnect switches not included as an integral part of equipment.

H. Furnish and install a complete Lighting Control System.

I. Complete the alterations, additions, and renovations to the electrical system in the existing building as specified herein or as shown on the drawings.

J. Procure and pay for permits and certifications as required by local and state ordinances and Fire Underwriters certificate of inspection.

K. Visit the site and determine conditions that affect this contract. Failure to do so will in no way relieve the Contractor of his responsibility under his contract.

L. Submit to the Architect a certificate of final inspection from local and/or state inspection authorities.

M. Establish and maintain temporary electrical services for construction purposes.

1.07. DRAWINGS AND SPECIFICATIONS:

A. This Contractor shall examine drawings and Specifications relating to the work of all trades and become fully informed as to the extent and character of work required and its relation to all other work in the project prior to submission of bid and prior to the start of any construction.

B. Drawings and Specifications shall be considered as complementary each to the other. What is called for by one shall be as binding as if called for by both. Where conflicts occur, secure clarification from the Architect in advance of bidding; otherwise incorporate the more stringent conditions into the bid price.

C. Omissions from the drawings and specifications or the mis-description of details of work which are evidently necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omissions and details of work; they shall be performed as if fully and correctly set forth and described in the drawings and specifications.

D. The drawings indicate diagrammatically the extent, general character, and the approximate location of the work to be performed. In the interest of clearness, the work is not always shown to scale or exact location. Check all measurements, locations of conduit, fixtures, outlets, and equipment with the detailed architectural, structural, and mechanical drawings, and lay out work so as to fit in with ceiling grids, ductwork, sprinkler piping and heads, and other parts. Take finished dimensions at the job site in preference to using scale dimensions.

E. Where the work is indicated but with minor details omitted, furnish and install the work complete so as to perform its intended functions.

F. Where doubt arises as to the meaning of the plans and specifications, obtain the Architect's decision before proceeding with parts affected; otherwise assume liability for damage to other work and for making necessary corrections to work in question.

G. Except as noted above, make no changes in or deviations from the work as shown or specified except on written order of the Architect.

1.08. EXISTING CONDITIONS:

A. Before submitting a bid, visit the site and ascertain all existing conditions.

B. Make such adjustments in work as are required by the actual conditions encountered.

C. No consideration will be given after bid opening for alleged misunderstandings regarding utility connections, integration of work with existing system, or other existing conditions.

1.09. SUBMITTALS:

A. Follow procedure outlined in Division 1.

B. Submittals shall be bound together and shall include a coversheet indicating the following:
   1. Project name
   2. Trade contractor's name
   3. Supplier's name
   4. Name and phone number of supplier's contact person
   5. A list of each item submitted with manufacturers' names and model numbers.

C. Within 20 days of award of contract and prior to beginning any work on the project submit six (6) copies of manufacturer's drawings/data sheets for the following items to the Engineer for review:
   1. Conductors
   2. Cable Pulling tensions. Provide cable pull tension calculations (lateral and longitudinal) on all underground cable runs over 150 feet for cables sized #1 and larger. Provide one line diagram indicating pulling tensions on each run and number and size of each pull box along anticipated route. Calculations shall include changes in direction or elevation of feeder runs.
   3. Wiring Devices
   4. Conduit Wrapping Tape
   5. Panelboards
   6. Power system breaker coordination. Submit proper breaker settings recommendations with breaker coordination study.
   7. Contractor shall coordinate with mechanical/plumbing shop drawings prior to submitting power package to engineer. Adjust overcurrent devices accordingley.
   8. Disconnect Switches
   9. Fire Stopping
   10. Lighting Control System: Include conduit and cable layout, terminal to terminal wiring showing color code and wire numbers, and complete technical data on each system component. Furnish the Owner one set of as built drawings at completion of the project. Coordinate with lighting control riser on drawings for further shop drawings requirements.
   11. Lighting Fixtures (include photometric data for each fixture)
   12. Fixture Support Equipment
   13. Data/Telecommunications System
       a. Cable
       b. Equipment
       c. Installer qualifications
       d. Makes and Model Numbers of Testing Equipment to be used.
   14. Secondary Surge Arresters
   15. Transient Voltage Surge Suppressors(Surge Protective Devices)
   16. J-Hooks

D. Submit samples upon request.

E. The Contractor is responsible for verifying all quantities and for verifying and coordinating dimensional data with the available space for items other than the basis of design.

F. **Provide a ½"= 1'- 0" scale drawing of all electrical rooms containing more than a single panelboard section or containing a panelboard and other electrical and/or mechanical equipment. These drawings shall be submitted along with equipment data sheets. Note we will no longer review submittals that does not have this information. Any delay will be the responsibility of the contractor for not submitting these drawings of the electrical rooms. Power submittals will be returned rejected without these drawings.**

G. The contractor shall review and approve or make appropriate notations on each item prior to submittal to the architect. Submittals without contractor's approval will be rejected.

H. Submittal reviews will be performed up to two times to review material submitted by contractor. Gunn & Associates will charge a review fee of a $1,000 to review submittals starting the third time submitted. If contractor needs Gunn & Associates, P.C. to perform another review of material after submittals have been submitted and approved to change manufacturers. A review cost of $1,000 per review. Payment must be received by Gunn & Associates prior to scheduling any additional reviews.

1.10. COORDINATION OF SERVICE WITH OTHER TRADES:

A. It shall be the responsibility of the Electrical Contractor to coordinate the electrical service characteristics to each piece of electrically operated equipment with all trades providing electrically operated equipment.

B. Within ten (10) working days of notification to proceed with construction from the Architect, the Electrical Contractor shall notify, in writing, all trades providing electrically operated equipment the characteristic of the electrical power being supplied to each piece of electrically operated equipment.

C. A copy of this notification shall be provided to the General Contractor and the Architect.

D. Be informed as to equipment being furnished by other trades, but not liable for added cost incurred by equipment substitutions made by others which require excess electrical wiring or equipment above that indicated on drawings or specified.

E. The contractor providing the equipment shall be responsible for the additional costs.

1.11. PROGRESS OF WORK:

A. Schedule work as necessary to cooperate with other trades, Do not delay other trades. Maintain necessary competent mechanics and supervision to provide an orderly progression of the work.

1.12. PROTECTION OF PERSONS AND PROPERTY DURING CONSTRUCTION:

A. Take all precautions necessary to provide safety and protection to persons and the protection of materials and property.

B. Protect items of equipment from stains, 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.

C. Live panelboards, outlets, switches, motor control equipment, junction boxes, etc., shall be protected against contact of live parts and conductors by personnel.

1.13. CLEANING UP:

A. During the progress of work, keep the Owner's premised in a neat and orderly condition, free from accumulation of debris resulting from this work. At the completion of the work, remove all material, scrap, etc. not a part of this Contract.

1.14. AS-BUILT DRAWINGS, AND OPERATING AND MAINTENANCE INSTRUCTIONS:

A. Prior to the Final Acceptance Inspection the Contractor shall turn over to the Architect one set of reproducible "as built" drawings, including corrected fire alarm system shop drawings, three (3) sets of all equipment catalogs and maintenance data, manufacturers’ warranties, and three (3) sets of shop drawings on all equipment.

1.15. TESTING:

A. Upon completion of the work, conduct a thorough test in the presence of Architect or his representative, and demonstrate that all systems are in perfect working condition.

1.16. INSPECTIONS:

A. The contractor shall have all systems ready for operation and an electrician available to remove panel fronts, coverplates, fixture doors, etc., at the final inspection and any other scheduled inspections.

B. It is the contractor's responsibility to have the job ready for inspections when they are scheduled. We will perform inspections as required by our contract. If project is not ready during inspection and requires a re-inspection by Gunn & Associates, then the contractor shall pay Gunn & Associates, P.C. for the re-inspection. The payment shall be made directly to Gunn & Associates, P.C. in the amount to be determined by engineer. Not to exceed $1,500 for single re-inspection fee. Payment must be received by Gunn & Associates prior to scheduling re-inspection.

C. Inspections for Temporary or Permanent Power required by any utility companies are not in our scope of work. If contractor needs Gunn & Associates, P.C. to perform inspections, contractor must include an inspection cost of $1,000 per inspection in their base bid. Payment must be received by Gunn & Associates prior to scheduling inspection.

1.17. DEMONSTRATION:

A. By on-off, stop-start operation, demonstrate to the Owner or his representative, the use, working, resetting, and adjusting of each and every system. Submit statement initialed by the Owner that such demonstration has been made.

1.18. WARRANTY:

A. Warrant the entire electrical system in proper working order. Replace, without additional charge, all work or material that may develop defects (ordinary wear and tear or damage resulting from improper handling excepted) within a period of one year from date of final to general contractor. Provide the owner with two bound copies of all manufacturers' warranties.

B. Data and Telecommunications system cabling shall be warranted for a minimum of 15 years.

1.19. TEMPORARY SYSTEMS:

A. The Electrical Contractor shall be responsible for furnishing and installing equipment and materials necessary for providing electrical power and lighting where needed for the construction of the project.

B. Electrical Contractor will be responsible for paying for and providing temporary construction power and lighting for entire job site. Coordinate with local jurisdictions and utility companies and pay all fees necessary to get temporary power to the job site. General Contractor shall be responsible for all monthly utility cost for duration of project or date of substantial completion.

1.20. SERVICE INTERRUPTION CLEARANCE WITH OWNER:

A. Before submitting a proposal, check with the Owner concerning interruption of service to the existing electrical systems. No interruption shall be made except at such time and for such duration as approved by the Owner. The Contractor's bid shall include all necessary over-time and weekend work.

1.21. DEFINITIONS:

"AWG" - American Wire Gauge
"ADA" – Americans with Disabilities Act
"As required" - Any and all items required to complete the installation of an item so as to perform its intended function.
"Circuiting" - Conductors, raceways, raceway fittings, and associated hardware.
"EMT" – Electrical Metallic Tubing, "thin wall"
"IBC" – International Building Code
"Install" - furnish, install, and make all necessary connections to and/or for the item(s) indicated or specified.
"NEC" - National Electrical Code, ANSI/NFPA 70, latest edition or the edition adopted by the authority having jurisdiction.
"Necessary" - Any and all items required to complete the installation of an item so as to perform its intended function.
"NEMA"- National Electrical Manufacturers' Association
"NFPA" - National Fire Protection Association
"PVC Conduit" – Rigid Nonmetallic Polyvinyl Chloride conduit

"RGS Conduit" – Rigid galvanized steel conduit
"UL" - Underwriters' Laboratories, Inc.

PART 2 - MATERIALS

2.01. GENERAL:

A. This section includes all basic materials for raceways, fittings, busways, conductors, panelboards, switchboards, lighting fixtures and accessories, etc., as required for a complete installation.

B. All materials shall be new and listed by the Underwriters Laboratories. Material substitutions will be considered only when evidence of equality and suitability, satisfactory to the Architect has been presented in writing, with samples if requested by the Architect.

C. It shall be understood that the Architect/Engineer has the authority to reject any material or equipment used which is not specified or approved, or showing defects of manufacture or workmanship, before or after such material or equipment is installed.

2.02. CONDUITS:

A. Rigid Metal (Galvanized Steel-RGS) Conduit: Rigid metal conduit shall be mild steel piping, galvanized inside and outside, and conform to ASA Specification 080.1 and Underwriters' Laboratories Specifications. By Sprang, Republic, Wheatland, Triangle or Pittsburgh.

B. Electrical Metallic Tubing (EMT): EMT shall be high grade steel electro-galvanized outside and lacquer or enamel coating inside and conform to ASA Specifications 080.1 and Underwriters' Laboratories Specifications. By Sprang, Republic, Wheatland, Triangle or Pittsburgh.

C. Rigid Nonmetallic Conduit (PVC): PVC conduit where exposed shall be high impact Schedule 80; below grand and below or in slab PVC shall be of high impact Schedule 40 PVC and shall conform to Underwriters' Laboratories Standard UL-651. By Carlon, Kraley Pittsburgh, R.G. Sloan or Southwestern.

D. Rigid Aluminum: Rigid Aluminum conduit shall be manufactured from 6063, t-1 aluminum alloy and shall meet the requirements of Federal Spec. WW-C-540c and ANSI C80.5 and shall be U.L. listed in accordance with UL-6. Equal to products by V.A.W. of America.

2.03. COUPLINGS, FITTINGS, AND CONNECTORS:

A. RGS & IMC: By Appleton, Crouse-Hinds, Efcor, O-Z/Gedney, Raco, or Republic.

B. EMT: EMT fittings shall be all steel type setscrew or insulated throat compression type. Pressure indented or slip fit type will not be accepted. All connectors to be insulated. By Appleton, Efcor, Raco Steel City, or Thomas & Betts.

C. PVC: PVC fittings shall be of high impact PVC Schedule 40 or Schedule 80 to match the installed conduit. Joints shall be made with PVC solvent cement as recommended by manufacturer. By Pittsburgh, R.G. Sloan or Carlon.

D. Rigid Aluminum: Fittings used with Rigid Aluminum conduit shall be formed of the same alloy as the conduit or shall be copper free cast aluminum unless specifically indicated otherwise.

2.04. CONDUIT BODIES:

A. Conduit bodies shall be malleable iron except in kitchen, dishwashing, and waste water treatment areas conduit bodies shall be copper free cast aluminum with stamped aluminum covers.

B. Covers shall be screw retained with wedge nut or threaded body. Covers on bodies installed outdoors shall be approved and rated for installation outdoors.

C. Bodies shall comply with NEC 370 and 373.

D. RGS & IMC: By Appleton, Crouse-Hinds, Efcor, O-Z/Gedney, Raco, or Republic.

E. Conduit cannot be used as ground. Provide separate insulated green grounding wire.

2.05. BUSHINGS:

A. Bushings up to and including 1” shall have a tapered throat.
B. Bushings 1-1/4" and larger shall be the insulating type.
C. Grounding bushings shall be specification grade insulated grounding type bushings with tin plated copper grounding saddles and shall be equal to O-Z/Gedney Type BLG or HBLG.
D. Bushings shall be zinc plated malleable iron or copper free cast aluminum.
E. Bushings for terminating Data, Telecommunications, control, CATV, and similar conduits above ceilings and at backboards may be PVC or Polyethylene insulating bushings equal to those manufactured by Arlington Industries and Bridgeport Fittings.

2.06. EXPANSION FITTINGS:

A. Conduit Expansion Joints shall be UL Listed.
B. Expansion joints in rigid metal conduits shall consist of a threaded malleable iron body, pressure bushing, watertight packing, pressure ring, gasket, insulating bushing, and external grounding jumper, and shall be equal to O-Z Gedney Type AX with Type BJ bonding jumper.
C. Expansion joints for EMT conduit shall be same as above with additional EMT couplings and connectors and shall be equal to O-Z Gedney Type TX with Type BJ bonding jumper.
D. Expansion joints in PVC conduit shall be equal to Carlon Series E945.
E. Expansion joints shall provide a minimum of 4” of conduit movement.

2.07. BELOW GRADE THRU WALL WATER SEALS:

A. Thru wall water seals for conduits penetrating exterior below grade concrete walls shall be seal systems by O-Z/Gedney or The Metraflex Company.
B. Thru wall water seals for conduits penetrating exterior below grade concrete walls shall be Metraseal thru wall water seals by The Metraflex Company.

2.08. CONDUIT ACCESSORIES:

A. Conduit clamps and supports for metallic conduit shall be galvanized steel by Efcor, Steel City, or Mineralac. Conduit fittings by Appleton, Crouse-Hinds, O-Z/Gedney, Pyle-National or approved equal.
B. Conduit clamps and supports for nonmetallic conduit shall be nonmetallic high impact PVC by Carlon, Pittsburg, or Sloan.
C. Conduit clamps for aluminum conduits shall be stainless steel or cast copper free aluminum with stainless steel fasteners.

2.09. FLEXIBLE CONDUIT:

A. Liqudtight flexible metal conduit:
   1. Neoprene-jacketed liquidtight flexible metal conduit.
   2. Equal to Anaconda Sealtite.

2.10. ELECTRICAL TAPES:

A. General use electrical tape shall be 8 mil (.008”) thick, minimum, premium grade, pressure sensitive, flame retardant, vinyl electrical tape meeting UL 510, ASTM-D-3005, and MIL-I-24391C. The tape shall be equal to 3M No. 88 or Plymouth Premium 85 CW.
B. Rubber tape used as primary tape shall be a 30 mil (.030”) thick, minimum self-amalgamating, low voltage rubber tape rated for use through 600 V. Rubber tape shall be equal to 3M No. 2150 or Plymouth 122 Rubber Tape.
C. Electrical filler tape shall be a 125 mil (.125”) thick, minimum, self-amalgamating, low voltage insulating compound rated for use through 5 kV. Filler tape shall be equal to 3M SCOTCHFILL or Plymouth 125 Electrical Filler Tape.

2.11. PIPE WRAPPING TAPE:

A. Pipe wrapping tape shall be a 10 mil (.010”) thick, minimum, pressure sensitive, vinyl tape manufactured for pipe wrapping applications.
B. The tape shall be UV, bacteria, and fungus resistant.

C. The manufacturer's name and tape type shall be printed on the back of the tape.

D. Pipe wrapping tape shall be equal to Plymouth Rubber Co. PLYWRAP 11, or 3M No. 50.

2.12. WIRE NUTS:

A. Wire nuts for conductor splicing shall be winged type connectors with a square, plated steel spring and flame-retardant thermoplastic shell.

B. The connector shall be rated for the number and size conductors being connected.

C. The Wire Nuts shall be rated for 105ºC. And UL 486C listed.

D. Wire nuts shall be equal to connectors by Ideal/Buchanan, 3M/Scotch, or T & B,

2.13. SPLIT BOLT CONNECTORS:

A. Split bolt connectors for splicing conductors shall be UL 486A listed, shall be tin plated copper, and shall have a hexagonal head and nut.

B. Split bolt connectors for conductors sized AWG #4 and larger shall have a serrated spacer bar between conductors.

C. Split bolt connectors for splicing conductors AWG #12 through #6 shall be equal to Ilsco Type SEL and Type SK for AWG #4 and larger conductors.

2.14. MULTI-TAP CONNECTORS:

A. Multi-tap connectors shall be insulated type

B. Multi-tap connectors shall be rated for the conductor sizes indicated on the drawings.

C. The connectors shall be provided for the number of conductors indicated, including any future taps shown, plus a minimum of one additional tap.

D. Multi-tap connectors shall be equal to Ilsco Type PCT or Type PED-CP.

2.15. WATERPROOF WIRE JOINTS:

A. Splices made below grade shall be made connectors, UL listed as waterproof, for below grade applications.

B. Waterproof Twist On Connectors for Up to2#6 W/1#12 tap Conductors: Single piece wire nut pre-filled with silicone sealant. Sealant shall be rated for 45-400 degrees F. Connectors shall have same insulation rating as conductors. Sizes shall be available for connecting up to 2 #6 w1#12 tap conductors. Connectors shall be UL listed as waterproof for below grade applications and equal to Ideal Buchannan B-Cap Twist and Seal Wire Connectors, King Safety Products, Tyco/Raychem GelCap SL, or equal.

C. Waterproof Stub Splice Kit for up to #2/0 Conductors: Kit containing connector block, outer waterproof sleeve, and lubricant. Sleeve shall have same insulation rating as conductors. Kit shall be rated for feeder wire sizes #14 through #2/0 and tap wire sizes of #14 through #6. Connectors shall be UL listed as waterproof for below grade applications and equal to Tyco/Raychem GelCap SL.

D. Waterproof In-line Splice Kit for up to #2/0 Conductors: Kit containing connector block, outer waterproof sleeve, and lubricant. Sleeve shall have same insulation rating as conductors. Kit shall be rated for wire sizes #6 through #350 kcm. Connectors shall be equal to Tyco/Raychem GTAP.

E. Waterproof Splice Kit for Conductors above #2/0: Kit containing connector block, outer waterproof sleeve, and lubricant. Sleeve shall have same insulation rating as conductors. Kit shall be rated for wire sizes #14 through #2/0. Connectors shall be equal to Tyco/Raychem GHFC.

2.16. PLASTIC MARKING TAPE FOR MARKING UNDERGROUND CABLES AND CONDUITS:

A. Plastic marking tape shall be acid and alkali-resistant polyethylene film, 6 inches wide with minimum thickness of 0.004 inch.

B. Tape shall have a minimum strength of 1750 psi lengthwise and 1500 psi crosswise.

C. The tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 3 feet deep.

D. The tape shall be of a type specifically manufactured for marking and locating underground utilities.

E. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion.

F. Tape color shall be as specified in the table below and shall bear a continuous printed inscription describing the specific utility.

Red:	Electric
Orange:	Data, Telephone, Television,

2.17. FIRE STOPPING:

A. Fire sealant shall be intumescent caulk, putty, sheet and/or wrap/strip as required to attain the proper rating.

B. Caulk shall be equal to 3M CP25 N/S and/or S/L.

C. Putty shall be equal to 3M Fire Barrier Moldable Putty.

D. Sheet equal to 3M CS195.

E. Wrap/strip equal to 3M FS195.

F. Equal products by Dow Corning, Hilti, and Metacaulk will be accepted.

2.18. SPACERS FOR CONCRETE ENCASED ELECTRICAL DUCTS:

A. Spacers shall be interlocking high impact plastic assemblies, which provide horizontal and vertical spacing, and hold the ducts and re-bar, where applicable, in place.

B. The spacers shall be equal to Carlon Snap-Lok Spacers.

2.19. JUNCTION BOXES (THRU 4-11/16"):

A. Sheet Metal: To be standard type with knockouts made of hot dipped galvanized steel, By Steel City, Raco, Appleton or approved equal.

B. Cast: To be type FS, FD, JB, GS or SEH as required for application.

2.20. JUNCTION AND PULL BOXES (LARGER THAN 4-11/16"):

A. Shall be cast metal for all below grade exterior use and where indicated on plans. All other shall be oil tight, JIC boxes not less than 16 gauge, equal to Hoffman type "CH" boxes.

2.21. PULL BOXES:

A. Galvanized sheet metal screw-cover type with UL label as produced by Austin, B & C Metal Stamping Company, E-Box, Hoffman, Wiegmann, or approved equal.

2.22. JUNCTION AND TERMINAL BOXES FOR AUXILIARY SYSTEMS:

A. Junction boxes for auxiliary system circuiting splicing shall be formed of galvanized steel.

B. Boxes shall have hinged front, locking door(s).

C. Metal back plates shall be provided for mounting terminal strips or other devices.

D. Screw terminal strips shall be provided with a minimum of 25 percent spare terminals.

E. Boxes shall be sized to accommodate the terminal blocks and conductors, providing code required bending space.

F. Boxes for auxiliary systems shall be manufactured by Austin, E-Box, Hoffman, or Wiegmann.

G. Provide complete back boxes for all surface mounted devices. Back box shall have knockout on top and bottom as needed. Surface mounted junction boxes with devices mounted to it will not be accepted. Wiremold boxes will be accepted.

2.23. AUXILIARY GUTTERS (WIRING TROUGHS):

A. Gutters shall be of sizes shown and/or required by the NEC (whichever is larger), constructed of code gauge, galvanized sheet steel, painted ANSI 61 gray.

B. Gutters shall be UL listed and shall be of NEMA 3R construction in wet or damp locations or shall be as indicated on the drawings.

C. Gutters shall be as produced by Austin, B & C Metal Stamping Company, E-Box, Hoffman, Wiegmann, or approved equal.

2.24. STRUT SYSTEM FOR SUPPORT OF ELECTRICAL EQUIPMENT:

A. Strut shall be 1-5/8” except where heavier strut is required to support the load, for rigidity, or where specifically indicated otherwise.

B. Cold-formed steel, ASTM A 570 or A 446 GR A.

C. Stainless Steel Strut: Type 304, ASTM A 240.

D. Hot Dipped Galvanized Steel Strut: Zinc coated after manufacturing operations are complete, ASTM A 123 or A 153

E. Electro-galvanized Steel Strut: Electrolytically zinc coated, ASTM B 633 Type III SC 1.

F. Fittings: Same material as strut, ASTM A 575, A 576, A 36, A 635, or A 240.

G. Zinc Primer: As recommended by strut manufacturer.

H. Strut Systems shall be as manufactured by B-Line, Erico, Globe, Kindorf, MasterStrut, Power Strut, T&B SuperStrut, or Unistrut.

2.25. OUTLET BOXES:

A. General: Except as noted, boxes shall be standard hot dipped galvanized steel at least 1-1/2" deep, of metal at least 1/16" thick; sized to accommodate devices and conductors per NEC Article 370; product of Appleton, National, Steel City, or approved equal.

B. Ceiling and Wall Bracket Outlets: 4" octagonal boxes with plaster rings appropriate for finish surface.

C. Typical boxes (for switches, receptacles and auxiliary systems):
   1. All junction boxes shall be recessed within the confines of the walls unless otherwise noted. Junction boxes shall be accessible by means of a coverplate or a standard junction box cover whichever is appropriate for the installation.
   2. 4" square boxes ganged as required. Box volume shall be in accordance with NEC Section 370 – provide extensions as required.
   3. Furnish with 3/4" plaster rings where employed in plaster, 1" tile covers where used in ceramic tile, 1" plaster rings where set in exposed concrete, and otherwise appropriate for surface and construction.
   4. Use 4-11/16” square, 2-1/8” deep boxes where more than 10 conductors enter the boxes. Provide extensions as required to provide volume per NEC.
   5. Where existing walls are furred out with shallow hatch channel and sheet rock then the contractor will be required to use a shallow junction as required.
   6. All exposed junction boxes for receptacles, communications devices, switches, and fire alarm devices shall be provided with back boxes. Do not use standard stamped steel junction boxes when exposed. No exposed edges of devices plates will be allowed. No knockouts on the side of the box. Boxes shall be similar to Wiremold 500 & 700 Series or FS boxes. The wall plates will not be allowed to have overlap plates.

D. Boxes in Exposed (or Thin-Coat Plastered) Masonry: Where conduit connections permit, employ solid flush-type, square-cornered, masonry boxes with turned-in device holders; otherwise employ typical box with 1-1/2" square-cut tile cover.

E. Boxes used with Exposed Conduit: 4" square utility boxes.

F. Exterior Boxes: Galvanized cast-metal boxes, Crouse-Hinds Type FS or FD as appropriate. Make weatherproof with gasketed covers. Equal products by Appleton, Killark, O-Z/Gedney or approved equal will be accepted.

G. Exterior Boxes: All receptacle boxes shall be recessed unless specifically called out not to be. This includes exterior receptacles in all masonry type walls including but not limited to Pre-cast, Brick, Block, etc.

H. Boxes used with Recessed Lighting Fixtures: Provide a 4" square box with blank cover.

I. Boxes in Dry Wall Construction: Sectional type switch boxes at least 2-1/2" deep may be used instead of typical box (but not where dry wall finish is applied over masonry back-up and not where multi- gang devices occur).

J. Boxes installed exposed in kitchen and dishwashing areas shall be copper free cast aluminum with gasketed cast coverplates, without lift cover, unless specifically indicated otherwise on the drawings.

K. All junction boxes shall be mounted in accessible locations. Provide access panels as needed in hard or detention surfaces to access.

2.26. CONDUCTORS AND CABLES:

A. Power Conductors
   1. The ungrounded conductors (phase) and the grounded conductor (neutral) of each voltage system being installed shall be phase identified the full length of the conductor with the color characteristics manufactured in the insulation of cable from the cable manufacturer. Required color cable will then be installed for the specific voltage system as identified in these specifications.
   2. All conductors shall be copper with not less than 98% conductivity and with current carrying capacities per N.E.C. for 60°C. for sizes through #1 AWG and 75°C for conductors #1/0 and above.
   3. All conductors shall have manufacturer's name, type insulation, and conductor size imprinted on jacket at regular intervals.
   4. Conductors of size #10 and smaller shall be solid copper conductors with 600-volt type THHN or THWN insulation.
   5. Conductors of size #8 and larger shall be stranded copper conductors with 600-volt type THHN or THWN insulation.
   6. All motor branch circuits, HVAC, and plumbing equipment shall be stranded copper conductors with 600-volt type RHH-RHW insulation.
   7. All conductors installed in conduit below grade shall be rated for wet location.
   8. Manufacturer: Conductors shall be products of GE, Triangle, Phelps- Dodge, Anaconda, Rome, Habirshaw, General Cable, or approved equal.
   9. Fixture Wire:
      a. Conductors feeding into fixtures, other than fluorescent fixtures, of 300 watts or less shall be #14, 200°C., type SF-2, for fixtures of more than 300 watts #12, 200 °C., type SF-2 shall be used.
      b. Conductors pulled through fluorescent fixtures shall have Type TFN or TFFN fixture wire, rated 90oC.
      c. Conductors shall be by Dodge, Anaconda, Rome General Cable or Southwire.

B. Control and Signal Wire: Conductor type TFF, minimum size #16 copper and fully color-coded, shall be used. Conductors shall be by Anaconda, Houston Wire & Cable, General Cable, Phelps Dodge, Rome, or Southwire.

2.27. WIRING DEVICES:

A. General: Manufacturer's and catalog numbers listed are used to establish style, type and quality. Unless otherwise indicated on drawings, all wiring devices shall be UL listed, side-wired specification grade.

B. Manufacturers: Equal devices by Hubbell, Leviton, Eaton and P & S will be accepted. All devices shall have plaster ears.

C. Wall switches: 120/277V, 20A, AC, flush enclosed, quiet type switches with thermoplastic body and polycarbonate toggles. Switches shall meet Federal Specification WS-896. Switches shall be, Hubbell 1200 series, Leviton 1200 series, Eaton AH1200 series or P & S PS20AC series single pole, 2-pole, 3-way, or 4-way as required.

D. Duplex receptacles (general purpose): 125V/20A flush duplex back and side wired hard use specification grade receptacles, NEMA 5-20R configuration, with nylon face and body,

grounding terminal and break-off fins for converting to 2-circuit use. Receptacles shall meet Federal Specification WC-596. Color to match wall switches. Equal to P & S 5362, Hubbell CR20, Eaton 5362 or Leviton 5362.

E. Tamper Resistant Duplex receptacles, 125V/20A flush duplex, hospital grade, tamper resistant receptacles, NEMA 5-20R configuration, with nylon face and body, grounding terminal. Receptacles shall meet Federal Specification WC-596. Color to match wall switches. Equal to P & S TR62-H, Eaton TR8300 or Hubbell HBL8300SGDuplex combination 125/250-volt receptacles: receptacles shall be 20 amp, combination 125 volt (NEMA 5-20R)/250-volt (NEMA 6-20R) grounding receptacles.

F. Ground Fault Circuit Interrupt Receptacles: 125V/20-amp ground fault circuit interrupting receptacle for personnel protection, NEMA 5-20R configuration, Equal to Hubbell #GF5362, Leviton #6599, Eaton SGF20 or P & S 2091. Each GFCI symbol on drawing indicates a GFCI type receptacle. Do not through-wire non-GFCI receptacles from GFCI receptacles where ground fault protection is required. All exterior receptacles shall be ground fault interrupting type with weatherproof coverplates.

G. Faceless Ground Fault Circuit Interrupter: 125V, 20-amp ground fault circuit interrupter UL listed for personnel protection, equal to Hubbell GFR5350 Series, Leviton 6490, Eaton SGFD20 or Pass & Seymour Series 2081.

H. Single Receptacles: Flush Bakelite receptacles with side wiring and grounding terminal, voltage, amperage, and configuration as required for circuit indicated.

I. Each single or multi outlet receptacle, other than straight blade, 15 or 20 amp, 120 volts, NEMA 5-15R or NEMA 5-20R, shall be provided with matching cord plugs.

J. Multioutlet Assemblies, Strip outlets, 15 amp, 125V, grounded, outlets on 6” centers, equal to Wiremold V20GBx06. Where x = length indicated on the drawings.

K. Plugs for kitchen equipment to be plugged into wall mounted straight blade receptacles shall be angled type.

L. Wiring devices shall be of color as directed by Architect. Devices must be available in ivory, brown, black, white, and gray. Devices connected to the emergency generator shall be red in color.

M. All receptacles shall be tamper-proof type receptacles where required by the National Electrical Code.

N. Pin and Sleeve Devices:
   1. Pin and Sleeve Devices shall be watertight plugs and receptacles of the ratings shown on the legend and/or schedules.
   2. Devices shall be listed to UL Standard 498 and UL Classified ro IEC Standards 309-1 and 309-2.
   3. Devices shall be furnished as matching plugs and receptacles with cast aluminum angled backbox.
   4. Devices shall be manufactured by Hubbell, Leviton, Eaton or P&S.

2.28. DEVICE PLATES:

A. Type appropriate for the associated wiring device, equal to Sierra Stainless Steel Smoothline. Device plates shall be of color as directed by Architect. Devices must be available in ivory, brown, black, white, and stainless steel. Provide single plate of proper gang where more than one device occurs (do not gang dimmers with rocker switches).

B. Damp Location: 20 amp,125 and 250-volt receptacles - Covers shall be weatherproof when plugs are not installed, provide cast aluminum weatherproof coverplates with single lift cover and gasket equal to Hubbell CWP26H.

C. Wet Locations, 20 amp, 125 and 250-volt receptacles: Covers shall be weatherproof In-Use covers, rated NEMA 3R when in use and shall be constructed of cast aluminum with sealing gasket. Covers shall be equal to products by Hubbell, Leviton, Steel City, T & B, and Taymac.

D. Coverplates for exposed cast aluminum boxes in kitchen and dishwashing areas shall be cast coverplates, without lift cover, unless specifically indicated otherwise on the drawings.

E. Color: Wiring device cover plates shall be of color as indicated on drawings or directed by Architect. Devices must be available in ivory, brown, black, white, gray, and stainless steel.

F. Jumbo and Mini-Jumbo plates will not be accepted.

2.29. OCCUPANCY SENSORS AND ACCESSORIES FOR LIGHTING CONTROL:

A. Occupancy sensors shall be totally passive in nature, in that the sensors shall not emit of interfere with any other electronic device, or human characteristic. Sensors shall be dual technology, i.e.: Passive Infrared (PIR) and Microphonic.

B. PIR shall initiate an “on” condition and the PIR or microphones shall maintain the load “on”.

C. Upon detection of human activity by the detector the lights shall come on and a time delay shall be initiated to maintain the lights on for a pre-set time period. The time delay shall be factory set and field adjustable from 30 seconds to 20 minutes.

D. All devices shall be factory warranted for 5 years.

E. All sensors shall be low voltage, 12 to 24 volts and shall work in conjunction with remote power packs.

F. Occupancy sensors shall be as shown on drawings.

2.30. GROUNDING:

A. Ground Rods shall be ¾” x 10’ copperclad steel.

B. All grounding conductors shall be copper.

2.31. DATA AND TELECOMMUNICATIONS SYSTEMS:

A. Qualifications of Data and Telecommunications Systems Installer:
   1. The Cable installer sub-contractor shall be properly licensed and established in the business of data and telecommunications systems installation.
   2. Data and Telecommunications Cable Installers shall be certified as installers by BiCSi. Proof of Certification shall be provided prior to beginning installation.
   3. Cable installers shall be certified by the cable manufacturer and the connectivity hardware manufacturer and the entire structured cabling system covered by a manufacture/installer 15 year, minimum, warranty. Proof of Certification and Warranty agreement shall be provided prior to beginning installation.

B. Data and Telecommunications Outlets:
   1. Data and Telecommunications outlets shall be modular, Category 6 outlets configured for T568B (AT&T) termination. See drawings for model numbers.
   2. Modules shall be mounted in brackets that allow use of standard receptacle faceplates. See drawings for model numbers.
   3. The face of modules/jacks shall be flush with the face of the coverplate.
   4. Each outlet coverplate shall be capable of housing a minimum of four (4) data/telecommunications jacks.
   5. Each Phone/Data outlet shall have a minimum of two (2) RJ45 Category 6 jacks installed, one telephone and one data.
   6. Wall phone outlets for hanging phones shall have a stainless steel coverplate with integral lugs for modular wall hung phone installation complete with jack. Wall phone outlets shall be equal to Hubbell Series 630 plates.
   7. All unused jack ports shall be equipped with matching blank filler.
   8. Architect to select color of faceplate.

C. Data System Patch Panel:
   1. Patch Panel:
      a. See drawings for details.
   2. Cable Management Panel:
      a. See drawings for details.
   3. Rack Mounted Fiber Optic Patch Panel:
      a. See drawings for details.

D. Data and Telecommunications Racks:

1. Wall Mounted Equipment Rack:
   a. Wall mounted equipment racks shall be standard 19” wide X 6” deep X 10.5” high hinged front type.
   b. Wall mounted racks shall accept standard 19” panels.
   c. Panel frame shall be aluminum with front swing gate.
   d. Wall mounted equipment racks shall be standard 20.25” wide X 18” deep X 38” high (18 rack units) aluminum framed structures with black finish equal to Ortronics #OR-604045450.
   e. Wall mounted equipment racks shall be standard 20.25” wide X 18” deep X 50” high (26 rack units) aluminum framed structures with black finish equal to Ortronics #OR-604045450.
   f. The frames shall be predrilled and tapped with #12-24 threaded EIA hole pattern.
2. Fiber Optic Wall Mount Patch Cabinets:
   a. Fiber Optic Cable Wall Mounted Cabinets shall be fully gasketed, powder coat steel cabinets which accept modular adapter panels for up to 12 multimode terminations.
3. Equal products by Systimax or Belden shall be acceptable.

E. Telecommunications and Data Cables:
1. Cables shall be warranted for a period of 15 years by the manufacturer and installing contractor.
2. Telephone and Data Cables:
   a. Telephone and Data cables shall be as called out on drawings.
   b. Cable shall be plenum rated where required.
   c. Cables shall be manufactured by Berk-Tek, Systimax, General, Hubbell, or Belden.
3. FiberOptic Cable:
   a. Fiber Optic Cable shall be as called out on drawings.
   b. Cables shall be manufactured by Berk-Tek, Systimax, General, Hubbell, or Belden.

F. Warranty: The entire Cat 6 and cabling system shall be warranted in writing by the cable manufacturer and certified contractor for a minimum of 15 years.

2.32. LIGHTING FIXTURES

A. General:
1. All Lighting Fixtures shall be UL labeled.
2. Fixtures installed in fire rated ceilings or ceiling assemblies shall be rated for installation in fire rated ceilings.
3. Furnish fixtures complete with lamps, ballasts and internal wiring factory installed.
4. Fixtures shall be furnished as specified herein and as shown on the fixture schedule on the plans. Catalog numbers shown are for basic units; furnish all fixtures complete with flexible connections, trim, plaster frames, and all other appurtenances necessary to the installation.
5. Substitutions: Reference to a specific manufacturer's product is made to establish a standard of quality and design, and to give a general description of the basic type desired. Equal products by the listed manufacturers will be accepted subject to the Engineer’s approval.
6. It shall be the responsibility of the contractor to verify the exact type ceiling, type fixture mounting and trim, and recessing depth of all recessed fixtures prior to purchasing any fixtures.
7. Stems on stem mounted fixtures shall be approved ball aligner type, swivel 30 degrees from vertical with swivel below canopy. Paint stems the same color as the fixture trim. Stems in unfinished areas may be unpainted conduit.
8. High and low bay fixtures shall be equipped with safety chains. Every suspended fixture in Gymnasium shall have safety chains.
9. Fixtures installed on the exterior of buildings, on poles, or on pedestals shall be rated for wet location installation.
10. All lighting fixtures installed in gymnasiums, hangars or similar use areas shall be provided with wire guard.

B. Emergency and Exit lighting Fixtures shall be equipped with a Self-testing module which shall perform the following functions:
   1. Continuous monitoring of charger operation and battery voltage with visual indication of normal operation and of malfunction.
   2. Monthly discharge cycling of battery with monitoring of transfer circuit function, battery capacity and emergency lamp operation with visual indication of malfunction. The battery capacity test may be conducted by using a synthetic load.
   3. Manual test switch to simulate a discharge test cycle.
   4. Modules shall have low voltage battery disconnect (LVD) and brownout protection circuit.
   5. All lighting fixtures and exit signs shown as emergency on drawings shall be provided with a minimum 1100 lumen emergency battery ballast capable of 90 minutes of illumination. No exceptions.

C. Lamps: Type and Lumen Output as scheduled.
   1. LED bulb shape shall comply with ANSI C79.1. Lamp base shall comply with ANSI C81.61.
   2. Minimum CRI of LED lamps shall be 80 with a color temperature as shown on drawings.
   3. Rated life of all LED lamping shall me a minimum of 50,000 hours failure to 75% of lamp output.
   4. LED lamping shall be capable of dimming from 100% to 0%.

2.33. PANELBOARDS:

A. General: All panelboards shall be dead front type manufactured and installed in accordance with UL and NEMA standards and shall carry a UL label. Ampacity, service voltage, and configuration shall be as indicated on drawings. Panelboards shall be clearly marked with ampacity, voltage, and maximum short current ratings.

B. Manufacturer: Panelboards shall be as manufactured by Cutler-Hammer, Square D, or Siemens.

C. Enclosure:
   1. Panelboard enclosures shall be as indicated on drawings.
   2. Unless otherwise indicated, all boxes shall be constructed of galvanized (or equivalent rust-resistant) sheet steel with hinged front trim.
   3. Fronts shall be door in door with two lockable latches to open door, lock, and latch. All panelboard locks shall be keyed alike. Piano hinges with screw latches will not be permitted.
   4. Fronts shall be finished with gray baked enamel over a rust-inhibiting phosphatized coating.
   5. All dual section panels shall be equal in size. Sub-Feed circuit breakers will not be allowed to feed second section.
   6. Sub-Feed circuit breakers feeding additional panels or equipment shall be branch mounted.
   7. Provide permanent numbering of the panelboards. Stickers are not considered permanent.
   8. Any panelboard schedule that indicates more than 42 circuits shall be provided in two equally sized panelboards.
   9. Main circuit breakers shall be centered mounted. Main breaker cannot be mounted on buss bars with other circuit breakers.

D. Buss Assembly:
   1. Bussing shall be copper.
   2. The buss assembly A.I.C. shall be rated as indicated on drawings. Ratings shall be established by heat rise tests, in accordance with UL Standard 67.
   3. All bussing shall accept bolt on circuit breakers.
   4. Current carrying parts of all bussing shall be plated. In lighting and receptacle panels, bussing shall be designed for connection to the branch circuit breakers in the phase sequence format. Distribution panelboards shall be fully bussed.
   5. Ground bars shall be provided in all panelboards.
   6. Neutral bar shall be fully sized with lugs suitable for incoming and outgoing conductors.

7. Provide insulated ground buss where indicated on the panelboard schedules.

E. Circuit Breakers:
   1. Circuit breakers shall be quick-make, quick-break, thermal magnetic, molded case, bolt on type.
   2. Circuit Breakers shall be numbered and arranged as indicated on the panelboard schedules and/or single line wiring diagrams. Numbers shall be permanently attached to trim.
   3. SWD Circuit Breakers: Single pole circuit breakers rated 15 and 20 amperes and intended to switch 277 volts or less fluorescent lighting loads shall be UL rated for switching duty and shall be marked "SWD".
   4. HACR Circuit Breakers: Circuit breakers 60 amperes or below, 240 volts, 1-, 2-, or 3-pole, intended to protect multi-motor and combination-load installations involved in heating, air conditioning, and refrigerating equipment shall be UL listed as HACR type and shall be marked "Listed HACR Type."
   5. Circuit breakers serving fire alarm systems, dedicated emergency/exit lighting circuits, and area of rescue communications systems shall be equipped with a screw-on, mechanical handle blocking device which locks the circuit breaker in the "ON" position.
   6. Circuit breakers serving circuits in residential bedrooms shall be Arc Fault Interrupting(AFI) type circuit breakers and shall be UL 1699 listed.

F. Directories:
   1. Each panelboard shall be equipped with a metal directory frame with a clear cover welded to the inside of the door.

G. Equipment Short Circuit Rating: Short Circuit Interrupting Ratings shall be as indicated on the plans and schedules. Unless specifically indicated otherwise all rating are "Fully Rated" capacities. Where no rating is given, the contractor shall verify the available short current with the serving utility and provide equipment rated accordingly.

H. Lighting panelboard cans shall be a maximum of 20" wide and 5 ¾" deep. Cans of multi-section panelboards shall be the same size.

I. Provide nameplate as called out on drawings.

J. All circuit breakers 1200-amp and up shall comply with NEC Article 240.87 Arc Energy Reduction.

K. All flush mounted panel shall be provided with six (6) ¾" conduit stubbed up above accessible ceiling.

2.34. SAFETY SWITCHES:

A. Furnish and install safety switches as indicated on the drawings.

B. Switches installed on 277/480 volts systems shall be rated for 600 volts and those installed on 120/208 volt or 120/240-volt systems shall be rated for 240 volts.

C. Switches shall be NEMA Heavy Duty Type HD and Underwriters' Laboratory listed. Safety switches shall be Cutler Hammer, Siemens, or Square D.

D. General Duty disconnects will not be accepted.

E. Enclosures for switches mounted outdoors shall be NEMA 3R or as indicated on the plans.

F. Enclosures for switches installed in kitchen and dishwashing areas shall be NEMA 4X stainless steel or as indicated on the plans.

G. All safety switches for equipment with remote controls shall be equipped with a control circuit disconnect interlock.

H. Switches shall be lockable in the "ON" and in the "OFF" positions.

I. Provide each disconnect with a nameplate that indicates equipment name, voltage/phase, and feed from location.

J. Provide keyed brass locks on all disconnects that is located on the exterior of the building or in any area that is accessible to children or the public. All the brass locks shall be keyed the same and turn over 10 sets of keys to the owner at substantial completion.

K. Disconnect locations shown on drawings is diagrammatically shown. Disconnects shall be coordinated with other trades and placed in the optimal locations to serve equipment and shall be installed in the least obtrusive location. Disconnects will have to be moved at the cost of the contractor when there is conflicts with NEC clearances, access to space, or servicing of equipment. Architect/Engineer will have final judgment of proper location.

2.35. MANUAL MOTOR STARTERS (TUMBLER SWITCH TYPE WITH OVERLOAD PROTECTION):

A. Starting and thermal overload protection for single phase motors 1/8 Hp to 1 HP shall be provided by manual motor starters with overload units rated as required by the specific motor to be served.

B. Switches installed for site disconnect switches shall be equipped with padlocking provisions.

C. Starters shall be by Cutler Hammer, General Electric, or Siemens with NEMA Type 1 enclosure or NEMA Type 3R enclosure where installed outdoors.

2.36. TRANSIENT VOLTAGE SURGE PROTECTORS (SURGE PROTECTIVE DEVICES):

A. Provide transient voltage surge protectors (Surge Protective Devices) where indicated on the plans. At a minimum provide on all service entrance panelboards/switchboards and any panelboard/switchboards on the secondary side of a dry-type transformer.

B. Service Entrance Panelboards and at Subpanel Protectors shall be listed and labeled and components recognized in accordance with UL 1283 and UL 1449 Second Edition, including highest fault current of Section 37.3.

C. All devices shall meet or exceed the following:
   1. NEMA LS 1-1992.
   2. Minimum surge current capability, single pulse rated, per mode:
      a. Service Entrance – 100 kA (200 kA per phase)
      a. Distribution and branch panelboards – 80 kA (160 kA per phase)
   3. UL 1449, Second Edition, Listed and Labeled, and Recognized Component Suppressed Voltage Ratings shall not exceed (1.2x50□s, 6kV open circuit and 8x20□s, 500A short circuit test wave forms at end of 6” lead):

Voltage	L-N	L-G	N-G	L-L
208Y/120v	400	400	330	700
480Y/277V	800	800	800	1500

   4. Testing shall be done at the end of 6” leads with the complete unit including any fuses and all other components making up the unit.

D. The devices shall have a minimum EMI/RFI filtering of –50dB at 100kHz with an insertion ratio of 50:1 using MIL-STD-220A methodology.

E. Devices shall utilize MOV’s of 25 mm diameter or larger, shall have pilot lights visible on the outside of the enclosure to indicate device operating condition, and shall provide contacts for remote monitoring of device condition.

F. Devices shall be modular in design with individual module fusing and thermal protection.

G. Devices shall incorporate visual alarm signals that indicate the failure of a single MOV and total loss of protection.

H. Wye connected devices shall provide L-L, L-N, L-G, and N-G surge diversion with L-N/L-G bonded at service entrance devices. Delta connected devices shall provide L-L and L-G protection.

I. Data Line Surge Protectors: Data Line Surge Protectors shall be UL 497B listed and labeled. The units shall be heavy duty devices utilizing a combination of silicone diodes and gas tube technology to provide surge protection.

J. All devices shall have a minimum warranty period of five years, incorporating unlimited replacement of suppressor parts if they fail during the warranty period.

K. Transient voltage surge suppressors shall be manufactured by AC Data Systems, Advanced Protection Technologies, Current Technologies, Cutler-Hammer, General Electric, Joslyn, Liebert, or MCG.

2.37. SECONDARY SURGE ARRESTERS:

A. Secondary surge arresters shall be UL listed under UL Classification (Lightning Protection) Surge Arresters (OWHX).

B. Surge arresters shall be rated at same voltage and phase configuration as service.

C. Arresters shall be equal to Cooper Power Systems ASZH Series, Cutler-Hammer, GE Tranquell, Joslyn Electronic Systems, Leviton models as required to match the voltage of the system served.

2.38. FUSES:

A. General: Fuses shall be UL listed time delay types with a minimum interrupting rating of 100,000 amps symmetrical.

B. 200 amps and below: Provide Class RK-5 current limiting, time delay, rejection type as manufactured by Busman Manufacturing, Ferraz Shawmut, or Littlefuse.

C. 201 to 600 amps: Class RK-1, current limiting, time delay, rejection type as manufactured by Bussman, Ferraz Shawmut, or Littlefuse.

D. Above 600 amps: Class L current limiting, time delay, as manufactured by Busman Manufacturing, Ferraz Shawmut, or Littlefuse.

2.39. DRY TYPE TRANSFORMERS:

A. Manufacturer: Transformers shall be as manufactured by Cutler-Hammer, GE, Square D, or Siemens.

B. General: Transformers shall be constructed in conformance with IEEE, NEMA and ANSI standards.

C. Transformers shall be dry type with copper windings, rated as scheduled on drawings.

D. Transformers rated at 15 KVA and below shall be Class 185 (115 degree Celsius rise); transformers rated above 15 KVA and above shall be Class 200 (150 degree Celsius rise).

E. Transformers shall have ventilated code gauge steel enclosure. Enclosures shall be for indoor installation unless indicated otherwise

F. Units shall be equipped with four (4) 2-1/2% full capacity taps, two above and two below rated primary voltage.

G. Core and coils shall be mounted on vibration pads and sound level of enclosed units shall be in conformance with NEMA standards.

2.40. LABELING:

A. Provide laminated plastic nameplates for each panelboard, equipment enclosure, relay, switch, and device.

B. Each nameplate inscription shall identify the function and, when applicable, the position. Nameplates shall be melamine plastic 0.125-inch thick, white with black center core.

C. Provide red laminated plastic label with white center core where indicated.

D. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core.

E. Minimum size of nameplates shall beone by 2.5 inches.

F. Lettering shall be a minimum of 0.25-inch high normal block style.

G. See Panelboard details for proper labeling of all panelboards.

2.41. PHOTOCELLS, TIME SWITCHES AND CONTACTORS:

A. Photocells: Units shall have 1" diameter, hermetically sealed, cadmium sulfide sensing cell with 3-prong NEMA locking plug, rated for wet locations. Units shall have built-in time delay.

Units shall be equal to Tork 5231 of correct voltage to match load or use with matching receptacle equal to Tork 2421.

B. Time switches:
   1. Unless otherwise indicated on drawings, time switches shall be 24-hour electromechanical type having synchronous motor drive with two single pole double throw contacts rated 20 amps minimum.
   2. Unit shall have spring back up, with automatic rewind, capable of providing 16 hours minimum of reserve power upon electric power failure.
   3. Units shall be furnished in an enclosure, NEMA 1 indoor and NEMA 3 outdoors. Enclosures shall be flush mount unless otherwise indicated on drawings.
   4. Units shall be Tork 7120L, or equal by Paragon or Sangamo.
   5. Time switch(es) shall be digital, seven day format, two channel time switches with 9v lithium battery 30 day back-up and with metal indoor enclosure. The controllers shall be equal to Tork #DW200A-Y.

C. Contactors: Units shall be electrically held or electrically operated mechanically held, as indicated on drawings, and shall be recommended by manufacturer for type of load served.

D. Contacts shall double-break type of same ampere rating as line side circuit wiring.

E. Contacts shall be field-convertible to normally open or normally closed.

F. Contactor coils shall be encapsulated. Electrically held contactors shall have continuously rated coils. Mechanically held contactors shall be equipped with coil-clearing contacts to energize coils only when switching.

G. Units shall be furnished in an enclosure, NEMA 1 indoor and NEMA 3 outdoors.

H. Units shall be equal to GE CR460 series in NEMA 1 or NEMA 3R enclosure as indicated.

2.42. CONCRETE:

A. Concrete for electrical requirements shall be:
   1. Composed of fine aggregate (sand), coarse aggregate (graded from three-sixteenth (3/16) inch to one (1) inch), Portland cement, and water proportioned and mixed so as to produce a plastic, workable mixture.
   2. Aggregates shall be free from detrimental amounts of dirt, vegetable matter, soft fragments, or other foreign substances.
   3. Water shall be fresh, clean, and free from salts, alkali, organic matter, and other impurities.
   4. Concrete shall have a minimum 3000 psi ultimate twenty-eight day compressive strength and a maximum three (3) inch slump.

PART 3 - EXECUTION

3.01. GENERAL:

A. This section includes the installation of the complete electrical system.

3.02. ELECTRICAL SYSTEM DEMOLITION:

A. Before any new work begins the Contractor shall determine and document in writing to the satisfaction of the Engineer the condition of existing electrical work and auxiliary systems that are to remain in service. After the new work begins any existing electrical work or systems that are found to be inoperative or defective and not so documented shall be repaired or replaced by the Contractor at no additional cost to the Owner.

B. Existing electrical equipment and materials to be reused shall be tested and repaired as required and installed for first class operation.

C. General: The manner-in-which the remaining portions of the electrical system are terminated, supported and generally maintained for permanent use shall comply with all applicable regulations of the National Electrical Code, applicable NFPA codes and any local codes.

D. Refer carefully to construction drawings prior to commencing with demolition to determine the intent of demolition. Contact the Engineer if there appears to be any conflict between the demolition and construction drawings.

E. See "Renovation" Section regarding modification and relocation of circuits.

F. Phasing: Phasing shall be as coordinated by the General Contractor.

G. Work in Occupied Areas: Coordinate work carefully with General Contractor to provide minimum disruption to occupied portions of project. Provide minimum of 24 hours advance notice to Owner of demolition activities that will affect Owner's normal operation.

H. Protections: Take necessary measures as required for protection of the Owner's personnel and the general-public, as well as Owner's property. Provide temporary barricades, partitions, bracing, and weather protection as needed. Remove all temporary protections at completion of work.

I. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. Maintain portable fire suppression equipment during flame-cutting operations.

J. System Protection: Protect and maintain all portions of existing system not indicated for demolition, including but not limited to light fixtures, panelboards and circuits.

K. Fire Protection: Coordinate with general contractor to ensure that all penetrations of fire-rated decks and partitions are properly sealed.

L. Removal of Circuits: All circuits indicated for removal shall be entirely removed, including raceway, back to take-off point or as far as possible without chasing (unless chasing is indicated). Where it is not possible to remove conduit, all conductors shall be removed and the conduit shall be permanently capped. Floor outlets indicated for removal shall be entirely removed, including outlet box, and capped below floor level (minimum 4" below floor level if in slab).

M. Where floor slab is damaged in the course of demolition, it shall be permanently repaired as soon as practicable.

N. Leave existing branch circuits and feeders which run through reworked areas and serve existing equipment to remain in service, continuous and uninterrupted.

O. Where service interruptions are required, obtain approval for interruptions in writing from Architect 14 days prior to interruption. Submit schedule of work to be performed and the time required to accomplish work with request for interruption.

P. Disposition of Material: Where electrical equipment is indicated for removal and not indicated for re-use, the owner shall have the option of taking possession of the equipment, the Contractor shall deliver any such material to a local site designated by the owner. The Contractor shall be responsible for disposing of all other materials in accordance with applicable codes and laws.

3.03. ELECTRICAL SYSTEM RENOVATION:

A. General: Provide renovations as indicated on drawings and specified herein as required for a complete, operational system, even though every item is not indicated.
   1. This Section is intended to serve as a supplement to the applicable sections within this Division, and in no way relieves the contractor from the requirements of any other Section.
   2. All renovations shall comply with all applicable regulations of the National Electric Code, applicable NFPA codes and any local codes

B. Materials and workmanship: Execute all work presenting a neat and workmanlike appearance when completed. Except where otherwise indicated, all materials shall be new, UL approved where a standard has been established. Where specific means and methods for affecting renovations are not covered in drawings and specifications, the contractor shall exercise prudent judgment in following accepted practices.

C. Modifications: All major deviations from the drawings and specifications shall be approved in writing by the Engineer.

D. Inspection:

1. Inspect all existing electrical system components which are accessible, including fixtures, wiring devices, raceway and panelboards.
2. Perform minor repairs to loose or damaged connections, damaged or missing supports, replacement of broken devices, replacement of missing plates and junction box covers and other visible damage or disrepair.
3. Report major damage to Engineer.

E. Renovation Services: In addition to the scope of work indicated on the drawings and specified herein, it shall be the responsibility of this Division to provide minor modification and repair services made necessary to electrical system components through the normal course of renovation. Such services shall include but not be limited to minor repair or relocation of branch circuits necessitated by the work of other trades, as coordinated by the General Contractor.

F. Penetrations: Coordinate penetrations of existing walls, decks, and roofs required for electrical system with General Contractor. Do not cut structural members without the prior consent of Structural Engineer.

G. Raceway.
   a. Unless specifically indicated otherwise, existing raceway may not be used.
   b. Where existing raceway is indicated for possible re-use, it shall be the responsibility of this Division to verify that the condition and configuration of the raceway is in compliance with the NEC.

H. Panelboards: Where new circuits are run to an existing panelboard, thoroughly inspect the panelboard for any indications of arcing, overheating, or other damage. Report damage to the Engineer. Unless specifically allowed, tandem circuit breakers shall not be utilized.

I. Clearing of Neutral Faults: Any and all neutral faults to ground on existing system shall be corrected.

J. Service Ground: Visually inspect existing service ground electrode system for damage and code compliance. Check continuity from panel to each electrode with a meter. Make repairs as required.

K. Lighting Fixtures: Where existing lighting fixtures are indicated for re-use, they shall be thoroughly cleaned and re-lamped, no exceptions. Where existing lighting fixtures are indicated for replacement, it shall be the responsibility of this Division to verify the compatibility of new fixtures with existing ceiling type, existing penetrations, available support, and other existing conditions prior to submittal of fixtures. Any variances or required modifications shall be clearly indicated on the fixture submittal.

L. Backfilling, Grading, and Sodding:
1. Restore surface features, including vegetation, at areas disturbed by Work of this Section.
2. Reestablish original grades, unless otherwise indicated.
3. If sod has been removed, replace it as soon as possible after backfilling is completed.
4. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition.
5. Include application of topsoil, fertilizer, lime, seed, sod, sprig, and mulch. Comply with Division 2 Section "Landscaping." Maintain restored surfaces.
6. Restore disturbed paving as indicated.

3.04. ELECTRICAL SERVICE:

A. General: Arrange with local electric Utility Company for service to be brought to the building, and for installation of meter. Provide all material and labor not supplied by Utility Company so as to produce a complete installation meeting the Utility regulations.

B. Service requirements: It is the responsibility of this Section, prior to bid, to reaffirm with the Utility Companies involved, that locations, arrangement, Power Company voltage, phase, metering required, and connections to utility service are in accordance with their regulations and requirements. If their requirements are at variance with these drawings and specifications, contract price shall include an additional cost necessary to meet those regulations without extra cost to Owner after bids are accepted.

C. Notify Architect of any changes required before proceeding with work.

D. Fees and deposits:
   1. The Electrical Contractor shall be responsible for verification and payment of all utility fees associated with installation of the electrical service.
   2. The Owner shall pay the cost of establishing an electrical service account and permanent meter deposit.

E. Metering: Obtain metering equipment from Utility Company and install in compliance with the Utility Company's requirements. The Electrical Contractor shall provide and install all necessary metering raceways, fittings, supports, connectors and ground conductor necessary for a complete installation. Provide 100# pull wire in all metering conduits.

F. Main Service Equipment: Provide UL approved service entrance components as indicated on drawings or specified herein.

G. Provide a full-size copy of the AS-BUILT Power Riser Diagram framed behind plexiglass screwed to the wall near service entrance in main electrical room.

H. Service lateral or feeder: Extend lateral or feeder of the size shown on drawings from service equipment to the point of service as indicated (verify exact location with Utility Company).
   1. For Overhead Service, provide and install service entrance fitting on conduit and leave sufficient slack conductor for connection to utility feeder 10' above finish grade, 12' above drive and 18' above street.
   2. For Underground Service, provide and install underground conduit to utility riser, as directed by Utility Company. Conduit shall be of size and quantity as indicated on drawings. Provide 480# polypropylene pull line in each empty conduit.
   3. For Underground Service, provide and install transformer pad, primary underground conduit to utility riser as directed by Utility Company, underground secondary conduit, and secondary conductors. Conduit shall be of size and quantity as indicated on drawings. Provide spare 4" conduit in transformer pad extending 2' beyond edge of pad with PVC cap. Provide 480# polypropylene pull line in each empty conduit.
   4. On service transformers with multiple taps, it shall be the responsibility of this section to coordinate tap selection with the electric utility to insure the proper nominal voltage.

3.05. GROUNDING:

A. Bond the neutral conductor and various conductive materials in the building per NEC Article 250.

B. Grounding Electrode System: A bare copper grounding conductor shall be bonded to grounding electrodes as specified below. This conductor shall serve as ground for system neutral and for building equipment bonding. Where conductor is #6, or smaller, or is subject to injury, it shall be run in conduit, Schedule 80 PVC or Rigid Galvanized to which the conductor shall be bonded at both ends.
   1. Grounding electrodes shall be as follows:
      a. Cold water piping, if metal and in direct contact with the earth for 10 feet or more, at the point of entry into the building. Attach ground conductor to cold water piping with UL approved bronze clamp.
      b. Building structural steel, if present and accessible.
      c. Grounding electrode shall be attached with exothermic weld connection or irreversible crimp type connector similar to Burndy YGHR connectors. Crimps must be made with Burndy tool approved by the manufacturer for setting irreversible crimp connections.
      d. Foundation reinforcing bar system. Coordinate with General Contractor to provide turned up re-bar (sleeved) near service point for attachment of grounding electrode above grade. Grounding electrode shall be attached with UL approved exothermic weld connector.
      e. Driven ground rod(s).
         1) Three 3/4" x 10' copper weld rods shall be driven into the ground at the lowest point adjacent to the building, spaced a minimum of 10' apart.
         2) Ground rods shall be driven to 12” below grade.

f. Grounding electrode shall be attached with exothermic weld connection or irreversible crimp type connector similar to Burndy YGHR connectors. Crimps must be made with Burndy tool approved by the manufacturer for setting irreversible crimp connections.
g. Existing grounding electrode system. If an existing electrical service is in place, it must be bonded to the new grounding electrode system.

C. Connections to grounding rods, building structure, counterpoise, and conductor junctions shall be made by exothermic weld unless specifically noted otherwise.

D. Electric system (neutral) ground: The current carrying neutral leg of the wiring system shall be of insulated conductor and shall be connected to the grounding electrode conductor only via the neutral connection at the service equipment. Each branch circuit or multi-outlet branch circuit shall be provided with a dedicated neutral conductor.

E. Equipment grounding conductors:
1. An equipment grounding conductor (copper with green insulation except where bare copper is used) shall be provided in all wiring raceways.
2. Sizes shall be in accordance with NEC 250.
3. The equipment grounding conductor shall originate in the same panelboard, panelboard section, as the circuit conductors.
4. The equipment grounding conductor bonding the sections of multi-section panelboards shall be sized per NEC 250.
5. The equipment grounding conductor is not included in number of branch circuit conductors indicated on the drawings.

F. Computer backboard ground: provide a minimum #6 bare, solid copper grounding conductor from the electrical service grounding connection to the CBB. Leave six (6) feet minimum of free conductor. Install the conductor in PVC conduit where inside the building.

G. Grounding electrode resistance shall be less than 15 ohms. The resistance of the grounding electrode shall be tested by the Fall of Potential Method.

H. Lighting Standards (Poles): Install 10’ driven ground rod at each pole. On non-metallic poles, ground metallic components of lighting unit and foundations. Connect fixtures to grounding system with No. 6 AWG conductor.

I. Each grounding conductors at the service entrance ground bus bar shall be provided with a brass round identifying tag. Tag shall indicate where ground wire is terminated.

3.06. EXCAVATION, CUTTING AND BACKFILLING:

A. Provide cutting and patching, under the supervision of the General Contractor, as required for the work in Section 16.

B. Locate all existing below grade and/or below floor utilities prior to beginning any site excavation or cutting of existing floor slabs. The Contractor shall repair any damage to existing utilities or systems.

C. Saw cut existing concrete slabs and asphalt paving.

D. Trenching:
1. Dig trenches true to line, with a flat, even bottom.
2. Width of the trench shall provide not less than 3 inches clearance from the conduit to each side of the trench.
3. Ensure that foundation walls and footings and adjacent load bearing soils are not disturbed in any way.
4. Conduits shall be installed below footings where possible. Where a line passes under a footing, make crossing with the smallest possible trench to accommodate the conduits/sleeves.
5. Where a line must pass adjacent to and below the bottom of a column footing, or the corner of a continuous footing, backfill the trench with concrete up to the level of the footing bottom, for a distance away from the footing equal to the depth of the fill.
6. Keep excavation free from water, by pumping if necessary.

7. Where rock, soft spots, or sharp-edged materials are encountered, excavate the bottom for an additional 3 inches, fill and tamp level to proper elevation with sand or earth free from particles that would be retained on a ¼-inch sieve.
8. Remove and relocate existing obstructions as directed.
9. The Contractor shall be responsible for the repair and/or replacement of any damage to existing utilities, structure, or finishes.
10. Coordinate work with other trades as work progresses so cutting and patching will be minimal.
11. Refer to Section “Earthwork” for shoring, sub-soil assumptions and data, work around trees, surplus earth, etc.

E. See Section 16100, “Conduit Installation, Below grade and below slab conduit installation”, for installation of conduits in trenches.

F. Backfilling:
1. Immediately after inspection, cover conduits with 3” of compacted sand or earth free from particles that would be retained on a 1/4inch sieve. Do not to disturb the alignment or joints of the conduits.
2. Carefully backfill with 4” of earth free from clods, brick, etc., firmly puddling and tamping.
3. Thereafter, puddle and tamp every vertical 4” for hand tamping or 8” for heavy duty mechanical tamping.
4. Backfill shall meet the compaction requirements set forth in Division 2.
5. Backfilling Beneath Slabs and Pavement: Trenches beneath future slabs or pavement, including but not limited to buildings, drives, parking areas, sidewalks, playground surfaces, and equipment pads, shall be backfilled, from 3” above top of conduits to final grade, with crushed aggregate, AHD 825, type B, compacted in 4” layers to 100% ASTM 698.
6. Install marking tape above conduits at 12 inches below grade.

3.07. SLEEVES, INSERTS, AND SUPPORTS:

A. Provide and install No. 16 gauge galvanized steel or iron sleeves in all walls, floors, ceilings, and partitions. Sleeves shall have no more than 1/2" clearance around pipes and insulation.

B. The contractor shall furnish to other responsible trades all sleeves, inserts, anchors and other required items which are to be built in by other trades for securing of all hangers or other supports by the Contractor.

C. The contractor shall assume all responsibility for the placing and sizing of all sleeves, inserts, etc., and shall either directly supervise or give explicit instructions to other trades for their installation.

D. The contractor shall seal all conduits through floors, smoke partitions, and floor partitions, with a sealant approved for the application.

E. All sleeves through sound barrier walls and partitions shall be sealed with mineral wool.

F. Through the floor conduit penetrations shall be sealed watertight.

G. Furnish and install steel angles and channels as required for mounting and bracing heavy equipment and conduits. Steel shall be securely bolted or welded to structure and equipment bolted to the steel framework. Obtain the approval of the Architect prior to welding.

3.08. BELOW GRADE THRU WALL WATER SEALS:

A. Each conduit penetrating exterior, below grade, cast cncrete walls shall have the annular space aroung the conduit sealed with an approved Thru Wall Water Seal System.

B. Where the system includes water seal thru wall sleeves, the Electrical shall provide properly sized sleeves to the contractor responsible for constructing the walls and shall be responsible for the proper location of each sleeve.

C. Where openings are to be core drilled, the Electrical Contractor shall be responsible for the core drilling and for coordinating proper sizing and location of each opening.

3.09. FIRE STOPPING:

A. The Electrical Contractor shall be responsible for firestopping of all penetrations of fire rated partitions made by any and all lighting, power, and auxiliary circuiting, sleeves and/or equipment.

B. The Electrical Contractor shall submit manufacturers' UL System drawings for the systems to be utilized. The systems shall be compatible with the partition ratings as indicated on the Architectural drawings and in accordance with details on the Electrical drawings.

C. Penetrations of fire rated partitions shall be sealed with an approved fire sealant resulting in the completed penetration having the same fire rating as the partition.

D. The installation shall be in accordance with the manufacturer's UL system detail and installation instructions to attain the required fire partition rating.

E. Empty sleeves through 1 and 2 hour rated partitions shall be plugged with mineral wool.

F. Sleeves through 4 hour rated partitions shall be plugged with mineral wool and fire stopping material.

3.10. ROOF PENETRATIONS:

A. Furnish roof flashing for all equipment, installed under Section 16, which penetrates through the roof. Flashing shall be approved by the Architect prior to installation.

3.11. CONDUIT INSTALLATION:

A. Conduits shall be as follows:
1. Overhead Service Entrance - Rigid Galvanized Steel (RGS) Conduit.
2. Underground Service Laterals: Schedule 40 rigid PVC in horizontal runs with rigid galvanized steel elbows turning up to vertical RGS.
3. Where subject to moisture or mechanical injury - RGS conduit.
4. ALL conduits exposed to moisture or subject to mechanical damage shall be RGS. Where conduit exits building, the changeover from EMT to rigid shall be inside exterior wall.
5. In open shop and industrial installations RGS shall be run to 10' A.F.F.
6. All conduit exposed on the outside of the building envelope shall be Rigid Galvanized Steel (RGS) conduit. This includes all conduits on and/or under canopies or awnings.
7. In concrete or solid masonry – RGS conduit
8. Above furred spaces or in cells of hollow masonry - EMT
9. Concealed inside drywall construction walls and above lay-in ceilings – EMT.
10. Exposed conduits:
    a. Conduits installed exposed in shop, warehouse, and manufacturing areas shall be RGS up to 12' A.F.F. Conduits in such spaces above 12' A.F.F. may be EMT unless indicated otherwise on the drawings.
    b. Exposed indoors in non-hazardous unfinished areas not subject to physical damage - EMT
    c. Exposed in kitchen and dishwashing areas: Rigid aluminum.
11. Branch circuits in slab (3/4" and larger) - PVC. Turn up through slab with RGS ells - no exceptions. Extend rigid turn-ups 2" minimum above finish floor level.
12. Circuits beneath building vapor barrier - PVC. Turn up through slab with RGS ells - no exceptions. All elbows 45° and greater shall be RGS. Extend RGS turn-ups 2" minimum above finish floor level.
13. Below Grade – PVC with RGS, or rigid aluminum where applicable, elbows turning up to vertical. All below grade elbows 45° and greater shall be RGS.
14. Motor, HVAC equipment, and vibrating equipment connections - flexible metal conduit, liquid tight flexible metal conduit outdoors, in kitchen and dishwashing area, or in other wet areas. Liquidtight flexible nonmetallic conduit shall be used only where specifically indicated.

B. Conduit sizes:
1. Unless specifically indicated otherwise herein or on the drawings, the minimum conduit size shall be 3/4".
    a. All conduits installed below grade or below slab shall be ¾" minimum.

b. The minimum size for flexible lighting fixture “whips” shall be 3/8” and the maximum length shall be 6 feet. Lighting fixture “whips” shall be defined as flexible conduits with conductors feeding one or more recessed lighting fixtures installed in suspended, lay-in, acoustical ceiling systems from a single junction box.
c. ½” conduit may be for final connections to equipment or fixtures where conduit is less than three (3) feet in length and is extended from a junction box or from a ¾” conduit stub up.

2. Conduits shall be sized in accordance with the National Electrical Code as adopted by the local authority having jurisdiction or as amended to date, except where a larger size is indicated on the drawings or specified herein.

C. Layout:
1. Generally, follow the conduit layout shown on the drawings. However, the layout is diagrammatic only and must be adjusted for structural conditions, built-in equipment and other factors. Offsets are not indicated and must be furnished as required.
2. Install all conduits concealed except in equipment rooms and where exposed runs are specifically indicated.
3. Install conduit runs to avoid proximity to steam or hot water pipes. In no place shall a conduit be run within 6" of such pipes except where crossings are unavoidable, then conduit shall be kept at least 1" from the covering of the pipe crossed.
4. Eliminate trapped runs insofar as possible.
5. Do not chase new work, but instead build in conduit as work progresses.
6. Do not run conduit in cavity of exterior walls.
7. Run concealed conduits in direct line with long sweep bends and offsets where practicable.
8. Install exposed conduit with runs parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings, with right-angle turns consisting of cast-metal fittings or symmetrical bends.
9. Where conduits are indicated exposed overhead, runs down to wall outlets shall be concealed in wall.

D. Conduit Installation:
1. Securely fasten conduits to all sheet metal outlets, cabinets, junction and pull boxes with locknuts and bushings, taking care to see that stout mechanical and solid electrical connections are obtained.
2. All conduits shall have bushings with smooth beveled throats installed at both ends prior to installing conductors. Split bushings around conductors shall be taken to indicate that the conductors were pulled into conduit without the proper bushings installed and a basis for requiring the replacing of the conductors.
3. Conduits entering service enclosures (panelboards, disconnect switches, switchboards, motor control centers, etc. used as service entrance equipment) shall be provided with specification grade, insulating, grounding type bushings. Grounding bushing shall be bonded together and bonded to the service grounding buss.
4. Support:
a. Raceways shall be securely and rigidly supported to the building structure in a neat and workmanlike manner, and wherever possible, parallel runs or horizontal conduit shall be grouped together on adjustable trapeze hangers.
b. Support shall be provided at appropriate intervals not exceeding eight (8) feet with straps, hangers, and brackets specifically designed for the application.
c. Channels shall be 1 inch for 18-inch wide trapeze, 1-3/8 inch for 24 to 30 inch, and 1-5/8 inch for over 30-inch wide trapeze.
d. Perforated steel straphangers, “butterfly clips”, or tie-wire supports are not acceptable.
e. Conduits shall not be supported from ceiling support wires.
f. Conduit shall not be supported from mechanical system ducts or piping.
g. Conduits installed along wall surfaces shall be supported with galvanized steel brackets specifically designed for conduits and sized for the conduit used.

h. PVC conduits shall be supported per the NEC with PVC or stainless clamps and stainless-steel hardware.
h. Attach to supporting devices with screws, bolts, expansion sleeves or other workmanlike means appropriate to the surface.
i. In stud walls, anchors shall be completely rattle proof.
j. For conduits in damp and wet locations, use stainless steel clamps and stand-offs, or galvanized malleable or cast-iron clamps and spacers.
k. All mounting hardware for aluminum conduit shall be stainless steel.
l. Surface mounted conduits installed in kitchen and dishwashing areas shall be supported off walls approximately 3/16".

5. Thread rigid conduits so that the ends meet in couplings; cut ends square, ream smooth and draw up tight.
6. All field cut threads shall be cleaned with a solvent such as mineral spirits and painted with two coats of galvanize primer.
7. Cap conduit ends to keep out water and trash during construction.
8. Field made bends:
   a. Avoid field-made bends where possible, but where necessary, use a proper hickey or conduit-bending machine.
   b. Field made bends in PVC conduit shall be made with a heated PVC conduit bender.
   c. Make no bends with radius less than six times the conduit diameter, nor more than 90 degrees.
9. Make changes in direction with pull boxes, symmetrical bends and/or cast-metal fittings.
10. Total bends in any conduit run shall not exceed the equivalent of four, quarter (90°) bends for a total of 360°, per NEC, between pull boxes.
11. Replace any crushed or deformed conduits.
12. Conduits passing through roofs shall be in place before roof is installed.
13. Conduits installed in concrete/grout filled CMU walls shall be Rigid steel or IMC conduits installed field wrapped with 0.010 inch-thick pipe-wrapping plastic tape applied with a 50 percent overlay. Painted on coating shall not be acceptable.
14. Where conduits pass through or across building expansion joints, provide hot-dipped galvanized expansion fittings with bonding jumpers.
15. Ensure that all penetrations of firewalls are sealed per NEC and IBCC.
16. Right and left couplings shall not be used; conduit couplings of the Erikson type shall be used at location requiring such joints.
17. Paint all conduits exposed in finished spaces. Paint shall consist of one coat of zinc rich primer plus two top-coats of water-based latex paint, color to match adjacent finishes. Verify colors and paint system with Architect.
18. All conduit runs entering the building from outdoors shall be sealed against moisture migration and condensation by filling with insulating type foam.
19. All conduits passing through walls of coolers or freezers shall have seal fitting installed on the outside of the cooler/freezer wall and within 3" of the wall. Fitting shall be sealed per manufacturer's recommendations.
20. All conduits exposed to water shall have flexible conduits with a drip curve in conduit to keep from allowing water run into enclosure and provide a Myers hub connector to the enclosure.
21. Install telephone, data, intercom, and signal system raceways, 2-inch trade size and smaller, in maximum lengths of 150 feet and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements, in addition to requirements above.

E. Below grade and below slab conduit installation:
   1. See Section 16100, "Excavation, Cutting, and Backfilling" for trenching and backfilling requirements.
   2. Rigid steel or IMC conduits installed below slab-on-grade or in the earth shall be field wrapped with 0.010 inch thick pipe-wrapping plastic tape applied with a 50 percent overlay, or shall have a factory-applied polyvinyl chloride, plastic resin, or epoxy coating system. Painted on coatings shall not be acceptable. Wrap shall extend a minimum of 1"

above slabs or 3” above finished grade where there is no slab. Alternate methods must be approved by Engineer prior to bids.

3. Top of the conduit shall be not less than 30 inches below grade.
4. Run conduit in straight lines except where a change of direction is necessary.
5. Conduits stubbed up from below grade or slab into exterior walls shall be turned toward the interior of the building below slab fill perpendicular to the wall. Conduits shall not be turned out toward the exterior unless specifically indicated to do so.
6. Placing of conduits below slab on grade:
   a. Conduits 1-1/4” and larger shall be installed a minimum of 12” below the bottom of slab in the clay/sand fill below any gravel fill material.
   b. Conduits 1” and smaller may be installed in the porous/gravel fill below the vapor barrier.
7. Multiple Conduits:
   a. Separate multiple conduits by a minimum distance of 2-1/2 inches horizontally and 3 inches vertically, except that light and power conduits shall be separated from control, signal, and telephone conduits by a minimum distance of 3 inches horizontally and vertically.
   b. Where multiple layers of conduits are to be placed in a trench, each layer shall be placed in the trench, straight and parallel, clear fill material (see Excavation, Cutting, and Backfilling) placed and tamped in place to provide the specified spacing, and each subsequent layer placed in the same manner.
   c. Stagger the joints of the conduits by rows and layers to strengthen the conduit assembly.
   d. Conduits shall not be placed haphazardly in the trench.
8. Where conduits pass through footings or foundation walls:
   a. Conduits roughed in beneath slab shall exit the foundation perpendicular to the building spaced approximately 3" apart. Conduits shall be arranged in a single horizontal row where practical.
   b. Secure approval from the Architect and Structural Engineer prior to penetrating any footing or foundation wall.
   c. Schedule 40 PVC sleeves shall be cast in the footings or foundation wall for the conduits to pass through.
   d. Multiple sleeves shall have 3” clearance, vertically and horizontally, between the sleeves unless directed otherwise by the Architect and/or Structural Engineer.
9. Where PVC conduit is installed below grade a PVC to rigid metallic conduit coupling shall be installed in the horizontal run and a rigid galvanized steel conduit elbow installed to turn up to above grade. Where above grade conduits are indicated to be rigid aluminum the elbow turning up to vertical shall be rigid aluminum.
10. Rigid aluminum conduit shall be wrapped same as RGS through concrete from 2” each side of the concrete.
11. Rigid galvanized conduit shall extend a minimum of 6” above the finished floor level.
12. In hazardous areas the coupling shall be below grade and a single section of conduit installed up to 18” A.F.F. to accept the required seal fitting.
13. Wiring shall be extended in rigid threaded conduit to equipment, except that where required, flexible conduit may be used from 6 inches above the floor to the served equipment.
14. Conduits shall exit concrete slabs vertically.
   a. Where adequate support cannot be obtained by wiring to reinforcing steel, obtain support with solid iron stakes (which may be driven through membrane) cut off flush with slab after pouring.
   b. At turn-ups of adjacent runs of exposed conduit, obtain alignment by wiring members to a temporary horizontal member.
15. Empty or spare conduit stub-ups shall be capped with a threaded cap.
16. Encasement Under Roads, Structures, and at other locations indicated on the drawings:

a. Under roads, paved areas, railroad tracks, and other locations indicated on the plans install conduits in concrete encasement of rectangular cross-section providing a minimum of 3-inch concrete cover around ducts.
c. Provide plastic duct spacers that interlock vertically and horizontally. Spacer assemblies shall consist of base spacers, intermediate spacers, and top spacers to provide a completely enclosed and locked-in conduit assembly.
d. Install #4 rebar at each corner of the encasement and at not more than 18” on center vertically and horizontally on the sides of the encasement. #4 rebar hoops shall be installed at not more than 18” on center along the length of the encasement.
e. Concrete encasement shall extend at least 5 feet beyond the edges of paved areas and roads, and 12 feet beyond the rails on each side of railroad tracks.

17. Conduits to be installed under existing paved areas, which are not to be disturbed, and under roads and railroad tracks, shall be installed through a zinc coated, rigid steel, sleeve, jacked into place.
18. Conduits installed between handholes, manholes or other accessible areas shall have a minimum slope of 3 inches in each 100 feet away from buildings and toward manholes and other necessary drainage points.
19. The contractor shall provide properly rated and sized junction and pull boxes as required on all underground conduit runs 150 feet and greater so as to minimize pulling tensions on cables to be installed in conduits. In no case shall pull or junction boxes be further than 300 feet apart. Provide pulling tension calculations on all underground runs over 200 feet as required in Paragraph 1.09 Submittals.

F. Conduit Installation in concrete slabs:
1. Conduit installed in concrete slabs shall be rigid steel or IMC. Rigid steel or IMC conduits installed in slabs-on-grade shall be field wrapped with 0.010 inch-thick pipe-wrapping plastic tape applied with a 50 percent overlay, or shall have a factory-applied polyvinyl chloride, plastic resin, or epoxy coating system. Painted on coatings shall not be acceptable.
2. At slabs on grade, conduit, 3/4" maximum, may be run in the slab; larger conduit shall be run below slab.
3. Where adequate support cannot be obtained by wiring to reinforcing steel, obtain support with solid iron stakes (which may be driven through membrane) cut off flush with slab after pouring.
4. At turn-ups of adjacent runs of exposed conduit, obtain alignment by wiring members to a temporary horizontal member.

G. Flexible conduit:
1. At motor or equipment connections:
a. The maximum length allowable for flexible conduit shall be 36 inches except at lighting fixtures.
b. Flexible conduit installed outdoors shall be installed so as to provide an 8 inch minimum drip loop as measured from the lowest end of the conduit.
2. At lighting fixture connections provide flexible steel conduit by one of the manufacturers named for rigid.
a. Maximum length allowable shall be 72 inches.
b. Support flexible conduit such that it does not contact the ceiling system, ductwork, or other equipment above the ceiling. The conduit shall not be attached to a ceiling or ceiling support system.
c. All fixture whips shall be supported within 12” of outlet/junction boxes with single hole clamps.

H. Empty conduit:
1. Install a #14 galvanized fish wire or polypropylene pull cord with 14-inch free ends in all empty power and/or auxiliary conduits.
2. All conduits indicated to be terminated above the ceiling shall have an elbow turned out above the ceiling and shall be terminated with an insulating bushing.
3. Empty conduits stubbed out of buildings below grade:

a. Empty conduits stubbed out of buildings below grade shall extend 5 feet outside of the building foundation.
b. Install a 12”x 12”x 6” concrete marker at grade, above the end of the conduits, with “ELEC” inscribed on top.
f. Note on as-built drawings the exact location where empty conduit(s) are stubbed out below grade to the building exterior. Indicate conduit sizes and number of each size.
g. The contractor shall provide properly rated and sized junction and pull boxes as required on all underground conduit runs 150 feet and greater. In no case shall pull or junction boxes be further than 200 feet apart.

I. Conduit entries into enclosures, panelboards, and wiring troughs:
1. Layout conduit entries carefully to allow clearances for the number and sizes of conduits, electrical equipment, and future expansion.
2. In sheet metal equipment use Greenlee Knock-Out punch, or equal, to cut holes for conduit installation. Do not drill holes or cut holes out with snips or torch.
3. In cast enclosures and boxes drill conduit openings with correct size drill for tight fit.

J. **All junction box covers above the ceiling shall be labeled to which circuits or systems they contain**.

3.12. CONDUIT BODIES:

A. Conduit bodies shall be sized in accordance with NEC 370, and 373.
1. Conduit bodies for conductor sizes AWG #4 and larger shall be mogul type bodies sized in accordance with NEC 370-28.
2. Conduit bodies for conductor sizes AWG #6 and smaller shall be sized in accordance with NEC 370-16(c).

3.13. JUNCTION AND PULL BOXES:

A. Junction and pull boxes shall be sized per NEC to accommodate the installed number and size of conductors and conduits.

B. Boxes shall be securely fastened in place.

C. Boxes serving lighting fixtures installed in accessible, suspended ceilings:
1. Provide number of boxes as required to maintain fixture whips within the 6’ maximum length.
2. Generally, attach to underside of structure above, in accessible location, to accommodate a maximum 6' flexible conduit connection to each fixture or fixture run.
3. Where the structure above is more than 18” above the ceiling the boxes shall be supported within 18 inches of the ceiling with all thread rod and/or strut.

D. Install galvanized steel utility box plates, by box manufacturer, at exposed conduit fittings or boxes.

E. **All junction box covers above the ceiling shall be labeled to which circuits or systems they contain**.

3.14. WIRE AND CABLE INSTALLATION:

A. No conductor shall be smaller than #12 except where so designated on the drawings or specified elsewhere.

B. Multiwire lighting branch circuits shall be used where indicated.

C. Wiring devices shall be connected such that each device can be removed without interrupting the neutral or equipment grounding conductors serving other outlets on the same circuit(s).

D. Joints and splices in wire shall be made with solderless connectors and covered so that insulation is equal to conductor insulation. Wire nuts shall not be used for conductor #8 and larger.

E. No splices shall be pulled into conduit.

F. Both conductors and conduit shall be continuous from outlet to outlet.

G. No conductor shall be pulled into the conduit until the conduit is cleaned of all foreign matter.

H. When installing parallel conductors, it is mandatory that all conductors making up the feeder be exactly the same length, the same size, and type of conductor with the same insulation. Each group of conductors making up a phase or neutral must be bonded together at both ends in an approved manner.

I. MC cable or Romex cable will note be accepted unless specifically called for on drawings.

J. Wiring thru light fixtures and receptacles will not be accepted.

3.15. AUXILIARY GUTTERS (WIRING TROUGHS):

A. Auxiliary Gutters shall be sized per NEC to accommodate the installed number, size, and orientation of conductors and conduits.

B. Conductors serving a gutter shall be extended without reduction in size, for the entire length of the gutter.

C. All taps and splices shall be made with insulated multi-tap connectors.

3.16. CIRCUITS AND BRANCH CIRCUITS:

A. Outlets shall be connected to branch circuits as indicated on the drawings by circuit number adjacent to outlet symbols, and no more outlets than are indicated shall be connected to a circuit.

3.17. WIRE JOINTS:

A. Except for motor circuits, wire joints for #8 and smaller wire shall be made with twist on connectors.

B. Wire joints and splices for motor circuits, for conductors #6 and larger, and for smaller conductors where other connectors are not rated for the number of conductors involved shall be made with split bolt connectors rated for the applicable conductor size, number of conductors, and conductor material.
   1. Properly tape and insulate all joints to attain the same insulation rating as the cable insulation.
   2. Splices for #6 through #1 shall have a minimum or two (2) layers of rubber tape covered by a minimum of three (3) layers of electrical tape.
   3. Splices for #1/0 and larger conductors shall have a minimum of two (2) layers of electrical filler tape covered by a minimum of three (3) layers of electrical tape.

C. Splices in control conductors shall be avoided as much as possible. Stranded control conductor up to #12 may be connected or spliced with hand crimped type compression connectors. The connectors shall be of the proper size for the conductors being connected.

D. Splices and joints made with mechanical/hydraulic type compression connectors:
   1. Connections and splices shall be made with connectors rated for the applicable conductor size and conductor material.
   2. Dies used shall leave the die number embossed in the connector. The Contractor shall provide the Engineer with the Manufacturer’s connector and die chart prior to final inspection.

E. Taps and splices in auxiliary gutters/troughs shall be made with insulated multi-tap connectors.

F. Wire joints and splices made below grade shall be made with UL listed waterproof connectors, wire nuts, or splice kits.

G. All joints and splices shall be made in junction boxes, wiring troughs, or conduit bodies sized per NEC.

H. All connections to switchboards, panelboards, transformers, generators, ATS, or any other type electrical distribution type equipment shall be compression type fittings. Mechanical fittings will not be accepted in these applications.

3.18. STRUT SYSTEM FOR SUPPORT OF ELECTRICAL EQUIPMENT:

A. Strut Systems: Strut shall be utilized to rack exposed piping vertically or horizontally on walls and across slabs (where applicable). Strut may be utilized to support piping above ceilings, for support of equipment, and elsewhere as deemed appropriate.

1. Strut in conditioned spaces and above accessible ceilings shall be electro-galvanized.
2. Strut installed outdoors, in mechanical rooms, and in other unconditioned spaces shall be hot-dipped galvanized.
3. Strut installed in waste-water treatment facilities, kitchens, dishwashing spaces, and labs shall be stainless steel.
4. Strut fittings and hardware, including anchors, shall be same material as strut.
5. Saw cut strut square, 6” minimum lengths. Strut on continuous runs of pipe shall be same length. File or grind burrs from saw cuts.
6. After installation, electro-galvanized and hot-dipped galvanized strut shall be painted with two coats of zinc primer.

3.19. OUTLET BOX INSTALLATION:

A. General: The drawings indicate approximate locations only; determine the exact location at the building in view of all structural and architectural conditions. Obtain Architect's verification of final locations.

B. Outlet boxes shall be sized per NEC to accommodate the installed number and size of conductors, wiring devices, and conduits.

C. Ceiling and Wall Bracket Outlets: 4" octagonal boxes with plaster rings appropriate for finish surface.

D. Typical boxes (for switches, receptacles and auxiliary systems): 4" square boxes ganged as required. Furnish with 3/4" plaster rings where employed in plaster, 1" tile covers where used in ceramic tile, 1" plaster rings where set in exposed concrete, and otherwise appropriate for surface and construction.

E. Boxes in Exposed (or Thin-Coat Plastered) Masonry: Where conduit connections permit, employ solid flush-type, square-cornered, masonry boxes with turned-in device holders; otherwise employ typical box with 1-1/2" square-cut tile cover. .

F. Multiple Outlet Floor Boxes:
1. Verify the exact location of the floor boxes with the Architect prior to rough-in.
2. Set the boxes in accordance with the manufacturer’s instructions.
3. Boxes shall be set so that the box is flush with the finished floor; the boxes shall not cause a rise or fall in the floor.
4. The power outlets shall be connected to the circuits indicated by the numbers next to the symbol.
5. For Data outlets, install a 1” C. to above the nearest corridor ceiling.

G. Boxes used with Exposed Conduit: 4" square utility boxes.

H. Exterior Boxes: Cast-metal boxes, Crouse-Hinds Type FS or FD as appropriate. Make weatherproof with gasketed covers. Equal products by Appleton, Killark, O-Z/Gedney, or approved equal will be accepted.

I. Boxes used with Recessed Lighting Fixtures in suspended acoustical tile ceilings:
1. Provide a 4" square box with blank cover adjacent to each fixture or fixture group.
2. Install a flexible metal conduit fixture-”whip” from the box to the fixtures. The “whip” shall not be longer than 72”.
3. Attach the box to the underside of the structure above, in an accessible location, not more than 18” above the lay-in ceiling.
4. Where structure is more than 18” above the ceiling, the boxes shall be supported from all-thread rods, strut, or a combination of rod and strut.

J. Boxes in Dry Wall Construction:
1. Outlet boxes shall be securely fastened in place.
2. Outlet boxes installed in metal stud construction shall be supported by brackets screwed to studs. Clip on brackets shall not be accepted.
   a. Where a single outlet box is installed adjacent to a stud, brackets may attach to a single stud with a brace against the back of the opposite wall. Use a bracket equal to Caddy Fasteners “H” Series.

b. Where outlets do not fall next to a stud or where more than one outlet is installed between studs use a metal bracket attached to both studs. Brackets shall be equal to Caddy Fasteners “SGB", “TSGB”, or “RBS” series brackets.
c. Outlet boxes three gangs and wider shall be supported with support member screwed to the two adjacent studs. Brackets equal to Caddy Fasteners SGB or TSGB brackets may be used.

K. Sectional type switch boxes at least 2-1/2" deep may be used instead of typical box (but not where dry wall finish is applied over masonry back-up and not where multi- gang devices occur).

L. Outlets in unfinished masonry walls may be slightly adjusted upward or downward to suit masonry courses, provided outlets are mounted at uniform heights throughout the installation.

M. Coordinate installation of outlet boxes in masonry walls with the masonry contractor to insure that boxes are flush with face of wall and grouted smooth around boxes such that covers, fixtures or devices install flush on face of wall.

N. Where outlets at different levels are shown adjacent, install in one vertical line where possible. Avoid conflict with wainscot caps, splash backs and upper cabinets by adjusting height slightly up or down as directed.

O. Back to back boxes shall be staggered with at least 3 inches between boxes.

P. Back to back boxes in fire rated partitions shall have a minimum of 24” horizontal and/or vertical separation between them.

Q. Backs of boxes three gang and larger installed in fire rated partitions shall be wrapped with self adhesive fire stopping tape.

R. Locate switch outlets on the lock side of doors and so that the first switch in a single or gang installation is approximately 6" to 10" from the doorjamb. Verify door swings on Architectural Drawings.

S. Dimmers shall be ganged together in accordance with the manufacturer’s instructions where appropriate but shall not be ganged with toggle switches.

T. Coordinate carefully with appropriate trades the size and orientation (vertical, horizontal) of outlet boxes for thermostats, data outlets, fire alarm equipment, security equipment, and other control and communications outlets.

U. Mounting Heights:

Confirm all mounting height with local codes and authorities prior to bid and adjust as required:

Switches, generally	48" A.F.F. to top of outlet
Safety switches	Center of Switch 48" A.F.F. or as required.
Receptacles, generally	16" A.F.F. to bottom of outlet
Receptacles over counters	Bottom of outlet 6” above countertops or 2” above backsplashes
Telephone Outlets	16" A.F.F. to bottom of outlet
Computer Outlets	16" A.F.F. to bottom of outlet
Television Outlets	16" A.F.F. to bottom of outlet or as indicated
Wall mounted exit and emergency lights	Bottom of fixture 7’- 6” A.F.F. or 12” below Ceiling whichever is lower
Thermostat	Top of outlet 48" A.F.F. or as noted by mechanical drawings.
Clocks & clock outlets	Top of outlet 12" below ceiling, 8' maximum.
Brass bell	Top of outlet 12" below ceiling, 8' maximum.
Electric Water Coolers	Coordinate location with plumbing contractor to locate the receptacle(s) concealed within the EWC enclosure per manufacturer’s installation instructions.

V. Install blank coverplates on all unused power and auxiliary outlet boxes. Blank coverplates shall match other cover plates installed in the facility.

W. Furnish blank plates, matching those on the other outlets in the same area, on TV outlets and other outlets installed for future use.

3.20. WIRING DEVICES:

A. Install wall devices vertically' unless otherwise noted, so that all devices of any given height will align exactly.

B. Where boxes are not flush or square with the finished wall surface install wiring devices utilizing a leveler and retainer equal to Caddy #RLC or Steel City #SSF-SR.

C. Plates shall be plumb and true with all four edges contacting wall surface.

D. Mount receptacles with grounding terminals down.

E. Do not install devices until plastering or other type wall covering has been completed; install ahead of painting work but protect from paint spatter.

F. Use screw terminal connections only.

G. Do not gang dimmer switches with toggle switches.

H. Each single or multi outlet receptacle, other than straight blade, 15 or 20 amp, 120 volts, NEMA 5-15R or NEMA 5-20R, shall be provided with matching cord plugs and a minimum of 8 feet of Type SOW cable matching the receptacle size and configuration.

I. Pin and sleeve plugs for food service equipment shall be provided with a Type SOW cable connected to the equipment and plug of sufficient length to reach from the equipment to the plug with a minimum of 18" slack cork. Minimum length shall be 6 feet from equipment to plug.

J. Provide "Kellums" type grips at the plug, cord connector, and for overhead support on all overhead cord connector drops.

3.21. OCCUPANCY SENSORS AND ASSOCIATED DEVICES FOR LIGHTING CONTROL:

A. Occupancy sensors and associated devices and circuiting shall be installed in strict accordance with the manufacturer's instructions.

B. Wall, corner mounted sensors shall be mounted as close to the ceiling as possible on the manufacturer'' corner mounting bracket.

C. Power packs shall be mounted above the ceiling. Power packs shall be installed utilizing two(2) 4" x 4" x 2-1/8" deep boxes joined together using the nipple on the powerpack in accordance with the manufacturer's instructions. One of the boxes shall contain the power pack and control wiring and the other shall contain the power wiring.

D. All control and power circuiting shall be in EMT conduit. Where the devices are not equipped with conduit connections the conduit shall be brought up as close as possible to the device and terminated with insulating bushings.

3.22. ELECTRICALLY POWERED EQUIPMENT AND CONTROLS:

A. Provide and install power circuits for all electrically powered equipment and controls.

B. Heating, Ventilating, and Air Conditioning Control Wiring and Conduit:

1. The electrical contractor shall be responsible for installing outlet boxes for flush mounted HVAC system thermostats in dry wall or masonry wall construction and, where called for on the plans, for surface mounted metallic raceway in finished areas. Extend ¾" conduit from the outlet to above nearest accessible ceiling and terminate horizontally. Refer to the Mechanical/HVAC plans for thermostat locations and coordinate exact type outlet required and orientation with the Mechanical/HVAC contractor.
2. The Mechanical Contractor shall be responsible for the installation of all outlets and conduit for surface mounted devices in unfinished areas such as shops, warehouses, industrial facilities, etc.
3. The mechanical contractor shall furnish and install all low and line voltage control wiring required for the temperature control and/or ventilation systems.

C. Where Fire Alarm system duct mounted smoke detectors and HVAC shut down interface relays are provided, the Electrical contractor shall provide wiring from the smoke detectors to

the HVAC shut down interface relay. All circuiting from the shut down relay to the HVAC controls and/or starters shall be provided and installed by the Mechanical/Controls contractor.

D. The mechanical contractor shall furnish all motor starters for the temperature control and/or ventilation equipment unless otherwise indicated on the electrical plans or elsewhere in these electrical specifications. The electrical contractor shall install all motor starters, except for equipment with factory installed starters, for the temperature control and/or ventilation equipment.

E. Where exhaust fans are supplied with field installed speed controllers, the Electrical Contractor shall provide all necessary circuiting to the fan/speed controller and between the fan and the speed controller.

3.23. DISCONNECTING MEANS:

A. Where required by the National Electrical Code and/or other applicable codes or authorities, or where indicated on the electrical plans, the electrical contractor shall furnish and install an approved disconnecting means for all electrically powered equipment and/or controllers for such equipment whether the disconnecting means is or is not shown on the electrical plans.
   1. The location, rating, and enclosure for the disconnecting means shall be as required by the National Electrical Code and/or other applicable codes or authorities.
   2. Manual motor starters with thermal overload protection may be used in lieu of safety switches for individual motors under 1 horsepower.
   3. Motor rated switches may be used for the disconnecting means when supplied of correct voltage, phase, amperage rating, and enclosure type.
   4. The disconnecting means shall be as manufactured by General Electric, Cutler Hammer, or Siemens. Square D will not be accepted.

B. Where the disconnecting means shown on the electrical plans has a rating greater than the required code rating, the greater rating device shall be installed.

C. An approved horsepower rated fusible safety switch shall be installed where the circuit overcurrent protection does not provide overload protection for the equipment served and where required to meet the equipment's listing requirements.

D. Motor rated switches may be used as service disconnect switches when supplied with a pad-lockable, handle locking guard.

E. Install an engraved phenolic nameplate on the front of each switch enclosure identifying the equipment served by the safety switch and source of power (i.e., panel name and circuit number). Plates shall be white with black lettering. The plates shall be permanently installed with stainless steel screws or stainless-steel rivets.

F. All disconnects installed in public areas or in areas readily accessible to the public shall be lockable and shall be furnished with a brass lock. Provide 10 keys for each lock. All disconnect locks furnished on the project shall be keyed alike.

3.24. DATA AND TELECOMMUNICATIONS SYSTEMS:

A. The Data/Telecommunications Contractor shall have a BiCSI certified technician on the job at all times that system installation and/or testing is taking place is taking place.

B. All cables shall be installed by the Data/Telecommunications Contractor under the direct supervision of a BiCSI certified technician.

C. Install a 1” conduit from each Data and Communications outlet box to above the nearest corridor ceiling and terminate with an insulating bushing. The conduit shall be run without pull boxes, junction boxes, or conduit bodies and no more than the equivalent of three (3) 90-degree bends.

D. Each Data/Tele-Communications outlet shall have a Category 6 cable installed from each jack to the patch panel serving the area. Coordinate with drawings.

E. Make all terminations at jacks and patch panel in accordance with industry standards.

F. Cable installation:

1. The rated cable pulling tension shall not be exceeded. Cable shall not be stressed such that twisting, stretching or kinking occurs. Cable shall not be spliced.
2. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.
3. Placement of cable parallel to power conductors shall be avoided, if possible; a minimum separation of 12” shall be maintained when such placement cannot be avoided.
4. All cables shall be terminated at both ends; no cable shall contain unterminated elements.
5. Cable ties shall not be excessively tightened such that the transmission characteristics of the cable are altered.
6. Cable bending radius shall be 1” minimum. Minimum bending radius shall not be exceeded during installation or once installed.
7. Cables shall not come-in-contact with conduits, ceilings, lighting fixtures, ductwork, or water, sewer, or steam piping.
8. Cables routed above suspended ceilings shall be neatly bundled and supported with J-Hook Hangars attached to the building structure a maximum of 4 feet on center at not more than 24” above the suspended ceiling or in cable tray.
    a. Cables shall be bundled together with nylon cable ties at 3’ on-centers. Cable ties shall not be excessively tightened such that the transmission characteristics of the cable are altered.
    b. Hangars shall be configured as required to attach to the structure, wall mounted, ceiling mounted, suspended from all thread rod, or supported on strut attached to the structure. Anchors attached to sheetrock shall not be acceptable.
    c. Hangars shall be single or multiple tiered as required for the number of cables being supported.
    d. At Corridor crossings or other locations where wall mounting is impractical hangers shall be double sided, single tier J-Hooks suspended on all-thread rods supported from the building structure or beam clamps at a maximum of 48” on centers.
    e. No more than 32 Cat 6 cables shall be installed in 2” J-hooks.
9. Cables shall not be installed such that J-hooks are deflected, or such that cables are pulled tight against conduit walls where they exit the conduit.
10. Cat 6 cables shall not be bundled with, installed in j-hooks with, or installed in conduit with power circuiting, bell system circuiting, intercom system circuiting, or other auxiliary systems circuiting.
11. Cables routed through finished spaces which do not have suspended ceilings shall be installed in conduit. Routing of any exposed conduit shall be coordinated with the architect.
12. Above inaccessible ceilings, cables shall be installed in EMT conduits. Conduits shall be terminated at each end with insulating bushings. Each end of conduit shall be easily accessible.
13. Maximum number of Cat 6 cables in an EMT conduit shall comply with NEC.
14. On backboards cables shall be supported on “D” Rings at not more than 10” on centers. Cables shall be attached to the “D” rings in vertical runs with nylon tie wraps.

G. Category 6 Cable Testing:
1. All category 6 circuits shall be tested using a test set that meets the Class II accuracy requirements of TIA/EIA TSB 67 standard, including the additional tests and test set accuracy requirements of ANSI/TIA/EIA-568-A-5.
2. Testing shall use the Basic Link Test procedure of TIA/EIA TSB 67, as supplemented by ANSI/TIA/EIA-568-A-5.
3. All metallic cable pairs shall be tested for proper identification and continuity.
4. All opens, shorts, crosses, grounds, and reversals shall be corrected. Correct color coding and termination of each pair shall be verified in the communications closet and at the outlet.
5. Horizontal wiring shall be tested from and including the termination device in the communications closet to and including the modular jack in each room.
6. Makes and model numbers of testing equipment shall be provided to the Engineer for approval prior to beginning installation.

7. Each Category 6 cable shall be tested in accordance with ANSI/TIA/EIA TSB-67 for Link Performance Verification.
8. Phone outlets with RJ11 terminations shall have a Cat 5e connector installed for testing. After testing and certification of the cable the cable shall be terminated on the telephone jack.
9. Each Pair of conductors in each cable shall be tested for the following:
   a. Wire Map
   b. Length
   c. Attenuation
   d. Near End Crosstalk Loss (NEXT): Tested from both ends of cables.
10. Any cable(s) not meeting the minimum standards of ANSI/TIA/EIA TSB-67 shall be removed and replaced.
11. Results of the tests for each cable shall be printed out with the name of cable as affixed to the cable and terminals on site.
12. A bound copy of all test results shall be provided to the Engineer and Owner prior to final inspection. The results shall be bound in protective sleeves in a three-ring binder.

H. Optical Fiber Cables:
1. All optical fiber cable shall be installed in 1” EMT conduit. After installation, conduits shall be permanently labeled as containing fiber optic cable.
2. Innerduct may be installed from the horizontal runs of EMT down to the Data Racks.
3. Optical fiber cables shall not be spliced. Each cable shall be continuous from Patch Cabinet to Patch Cabinet
4. All Optical Fiber Cable shall be pulled with hand power only. Pulling tension shall not exceed the cable manufacturer’s rating. Torsion shall be avoided by-the-use of a swivel at the cable end. While under tension, a minimum bend radius of 20 times the outside cable diameter will be maintained through-the-use of pulleys and sheaves where required. After pulling, no bend may have a radius, at rest, of less than 10 times the outside cable diameter.
5. Provide cable lubricant compatible with the cable sheathing material when pulling cable. Attach pulling fixtures to the cable strength members. When indirect attachments are used, match the grip diameter and length to the cable diameter and characteristics. When indirect attachment is used on cables having only central strength members, reduce pulling forces to ensure that fibers are not damaged from forces being transmitted to the strength member. During pulling of the cable, continuously monitor pull line tension and shall not exceed maximum tension given by the cable manufacturer. Mechanical stress placed upon the cable during installation shall be such that cable is not twisted or stretched. Provide cable feeder guide between cable reel and face of duct or conduit to protect and guide cable into the duct or conduit as it played off the reel. As the cable is played off the reel, carefully inspect for jacket defects. Take precautions during the installation to prevent the cable from being kinked or crushed and to ensure that minimum bend radius is not exceeded at any time. When practicable, use the center pulling technique to lower pulling tension. Pull cable from center point of cable run towards the end termination points. Method may require cable to be pulled in successive pulls. When cable is pulled out of a manhole or handhole, protect cable from dirt and moisture by laying cable on a ground covering.
6. Each cable and conduit or inner duct is to be permanently labeled at each end with a unique cable number. In addition, labels shall be affixed to the cable and conduit/inner duct at every transition of a vault, hand hole, riser closet, or major pull box. For example, from Server Room to each building wing should be labeled as "FIBER-1, FIBER-2, FIBER-3 & FIBER-4 or some unique numbering scheme to identify each cable run.
7. Termination Standards
   a. The terminal ends of all fiber cable strands shall be field connectorized. The connectors shall be mounted on backboards and installed in enclosures called Fiber Integration Centers (FIC). Terminate both ends of all fibers within a fiber cable with LC style connectors.

b. Fiber Organizers: Fiber cables are to be terminated in fiber optic cable patch panels installed where indicated on the drawings.
c. Each enclosure shall be labeled with a machine-made label with permanent black ink on a white background. Labels shall be in the format to identify each cable run as well as the fiber pairs of each run. Labeled shall be on the faceplate with the identifiers of the cables it contains.
d. Each fiber optic strand shall be labeled with a unique identifier at the LC coupler in the FIC. Connectors shall be labeled on the identifying sheets on the front of the FIC.
e. Connectors and Splices: Fibers ends are to be terminated in LC-type connectors with composite ferrules. They must be of the "polish and adhesive" type. All runs are to be solid length point to point with no breaks to the termination points.
f. At each end of the cable, sufficient slack (10-15 ') shall be left to facilitate reasonable future relocation of the FIC. Slack shall be mounted on walls or ladder racks according to direction.

8. Testing
a. Before installing each individual fiber in each cable shall be tested with an adjustable OTDR for length and transmission anomalies while on the reel before installation.
b. Perform test on 100 percent of the fibers of each circuit and repeat from the opposite end of each circuit. Field tests shall include as a minimum:
1) Optical time domain reflectometer (OTDR) test at 850 nanometers, of the FO cable on the reel prior to installation. Calibrate OTDR to show anomalies of 0.2 dB as a minimum. Submit photographs traces to the Engineer.
2) Scale of the OTDR trace shall be such that the entire circuit appears over a minimum of 80 percent of the X-axis.
3) After installation, repeat the OTDR test in item 1) above. Replace cables that failed the test. Test new segment of cable to demonstrate acceptability. Submit photographs traces for each circuit to the Contracting Officer.
c. After Installation
1) High-resolution optical time domain reflectometer (OTDR) tests shall be performed from one end of each fiber.
2) All single mode and multi mode fiber strands shall be tested end-to-end for bi-directional attenuation at 850 nm and 1300 nm.
3) Tests should be conducted in compliance with EIA/TIA-526-14, Method B, according to the manufacturer’s instructions for the test set being utilized.
4) Tests must ensure that the measured link loss for each strand does not exceed the "worst case" allowable loss defined as the sum of the connector loss, (based on the number of mated connector pairs at the EIA/TIA-568 maximum allowable loss of 1.0 dB per mated pair), and the optical loss (based on the EIA/TIA-568 maximum allowable loss of 3.75 dB at 850 nm and 1.5 dB at 1300 nm).
5) Before termination, each fiber shall be tested with an adjustable ODTR for length, transmission anomalies, and end-to-end attenuation. Results are to be recorded and supplied to Engineer in the form of hard-copy printouts or photographs of screen traces.
6) After termination connectors shall be visually inspected for scratches, pits or chips and shall be re-terminated if any of these conditions exist.
7) Each terminated fiber is to be tested for end-to-end loss. As above, results are to be recorded and supplied to the Engineer.
8) The maximum allowable attenuation for any splice or termination is 0.5 dB.
d. Any fiber optic cable not meeting the minimum standards shall be removed and replaced or if it is determined that splices or terminations are at fault the splice or termination at fault shall be replaced.

I. Labeling:
1. Cat 6 Cables:
a. Each jack, Cat 6 cable, and fiber optic cable shall be labeled with an alpha/numeric identifier with a corresponding identifier on the punch down block and/or patch panel.

b. The number shall include the alpha/numeric patch panel name and the alpha/numeric patch panel port name where the cable is terminated.
c. Labels shall be installed at each end of Cat 6 cables where terminated.
d. A floor plan of the facility shall be provided showing outlet locations and cable identifiers for each cable and the location of all patch panels with the corresponding identifiers.

2. Fiber Optic Cables:
a. Each Fiber Optic cable shall be labeled with an alpha/numeric identifier.
b. Each fiber in a fiber optic cable shall be labeled with an alpha/numeric identifier corresponding to the cable number, the patch panel number, and fiber identifier (typically A through F for a six-fiber cable).
c. Labels shall be installed at each end of cables where terminated and on each fiber of each cable at the point of termination.
d. A floor plan of the facility shall be provided showing all patch panels with the corresponding identifiers, and cable identifiers for each cable at each patch panel.

3.25. LIGHTING FIXTURES:

A. The installation and support of all lighting fixtures shall be the responsibility of the Electrical Contractor.

B. Lay out work as shown, and to provide attractive and efficient arrangement.

C. Install fixtures level, plumb, and true with ceiling and walls, and in alignment with adjacent lighting fixtures.

D. Provide adequate and substantial supports for fixtures in accordance with manufacturers' directions and as specified herein.

E. A Re-lock system will not be accepted for installing lights.

F. Wire grid mounted luminaries individually to junction boxes with flexible conduit not more than 6 feet in length. Individual flexible connections shall be 2 #14 and 1 #14 ground THHN in 3/8" flexible conduit. Ground wire shall be bonded at each end.

G. Light fixtures with center baskets shall have all fixtures in a room installed with the center baskets oriented in the same direction.

H. Fixtures mounted in inverted “T” grids:
1. For round fixtures or fixtures smaller in size than the ceiling grid, provide a minimum of two wires per fixture located within 4 inches of each corner of the ceiling grid in which the fixture is located. Do not support fixtures by ceiling acoustical panels. Fixtures shall be supported independent of the ceiling system or shall be supported by at least two metal channels spanning the grid system, and secured to, the ceiling tees. One support wire shall be attached to the center of the fixture or to each of the metal channels.
2. Surface mounted fixtures:
a. Surface mounted fixtures installed on lay-in ceiling systems shall be supported independent of the ceiling system form the building structure with a minimum of two (2) 3/8”, minimum, all-thread rods.
b. Install nuts and washers on inside and outside of the fixture housing to provide a rigid installation.
c. Provide cross bracing as required such that fixtures have no lateral movement.

I. All stems on lighting fixtures shall be installed as follows: (except fixtures with slide grip hangers) first and last stem in row in first knockout from end of fixture. One stem shall be installed between each two fixtures, stem shall center joint, where fixtures join, and attach by use of "jointing plates". Nipples with lock nuts and bushings shall connect all fixtures in continuous rows other than recessed grid type.

J. All suspended lighting fixtures shall be provided with chain or cable sway bracing to keep fixtures from swinging.

K. Fixtures installed in fire rated assemblies shall be tented in accordance with the specified assembly.

L. Means shall be provided to keep insulation 4” minimum away from fixtures not rated for direct contact with insulation.

M. Prior to final inspection clean fixtures and lamps with a soft cloth or sponge and detergent (not soap) solution.

N. All lighting fixtures installed in gymnasiums, hangars, high bay or similar use areas shall be equipped with wire guards.

O. All emergency and exit lights designated on drawings shall be provided with an 1100-lumen battery ballast.

P. All light fixtures shall be supported to the structure independent of the ceiling system on two opposite sides. Support wires shall be different color from ceiling support wires. Engage all ceiling mounting clips. If light fixture is not provided with grid support clips, then the contractor will be responsible to support the fixture on all four sides with support wires. See “Typical Lay-In Luminaire Detail” on drawings for further requirements.

3.26. PANELBOARDS:

A. Panelboards shall be installed where shown on the drawings.

B. Ratings and configurations shall be as scheduled and/or indicated on the drawings.

C. The Electrical Contractor shall coordinate installation of equipment in Electrical and Electrical/Mechanical spaces with other trades such that Code required clearances and working space around the electrical equipment is maintained.

D. Conduit termination:
   1. In general use panelboards with blank ends, without knockouts.
   2. Layout conduit entries carefully to allow clearances for drywall or CMU wall thickness, and to accommodate the number and sizes of home run conduits and specified spare conduits.
   3. Use Greenlee Knock-Out punch, or equal, to cut holes in panelboard ends and/or sides for conduit installation. Do not drill holes or cut holes out with snips or torch.

E. Phase arrangement in panelboards shall be per the NEC, phase A, B, C from front to back, top to bottom, or left to right as viewed from the front.

F. In Delta connected systems the “high” leg shall be the B phase and shall be clearly marked with an orange outer finish.

G. Multi-Section Panelboards:
   1. Sub-feed conductors shall be the same size as the conductors feeding the main section.
   2. Circuiting originating in one section shall not pass through another section.
   3. Circuit conductors and grounding conductors shall originate in the same panelboard section.
   4. A separate isolated grounding conductor shall be installed from the main section to the sub-feed section(s).
   5. Where the panelboard is rated for service entrance equipment the sub-feed section shall have a separate isolated ground buss fed from the main section ground buss.

H. Labeling:
   1. Each panelboard shall have an engraved phenolic plate permanently installed on the front of the panel with the panel name, current rating, and voltage rating.
   2. Where there is more than one nominal voltage system the panel shall also have an engraved phenolic plate describing the means of identification used to identify the phase and system of each ungrounded conductor of the system served by the panel.
   3. Plates shall be white with black lettering.
   4. Panelboard circuit numbers shall be as indicated on the panelboard schedules.

3.27. PHOTOELECTRIC CELLS, TIMERS, AND CONTACTORS FOR LIGHTING CONTROL:

A. Install time clocks where accessible.

B. Install photoelectric cells so that lighting fixtures do not affect the cell.

C. Adjust time clock(s) and photoelectric cells as required for proper operation.

3.28. DRY TYPE TRANSFORMERS:

A. Flexible metallic conduit equipped with bare stranded copper ground jumper shall be provided for all transformer primary and secondary connections

B. Transformer secondaries shall be grounded to the building steel and to the primary and secondary side conduit systems.

3.29. IDENTIFICATION AND LABELING:

A. Feeder Designation:
   1. Non-ferrous identifying tags or pressure sensitive labels shall be securely fastened to all cables, feeders, and power circuits in vaults, pull boxes, manholes, switch gear and at termination of cables. Tags or labels shall be stamped or printed to correspond with markings on drawings so that feeder or cable number and phase can be readily identified.
   2. Where there is more than one nominal voltage system, each ungrounded system conductor shall be identified by phase and system wherever accessible per NEC. The means of identification shall be permanently posted at each branch-circuit panelboard.

B. Color Coding of Conductors:
   1. The ungrounded (phase) conductors and the grounded (neutral) conductors of each voltage system shall be identified by the following color coding method:
      a. 120/240 Volts, Single Phase, 3 Wire:
         1) Grounded (Neutral) Conductor --- White
         2) Ungrounded (Phase) Conductors --- Red, Black
      b. 120/240 Volts, Three Phase, 4 wire:
         1) Grounded (Neutral) Conductor --- White
         2) Ungrounded (Phase) Conductors --- Red, Orange, Black
      c. 120/208 Volts, 3 Phase, 4 Wire:
         1) Grounded (neutral) Conductor --- White
         2) Ungrounded (phase) Conductors --- Black, Blue, Red
      d. 277/480 Volts, 3 Phase, 4 Wire:
         1) Grounded (neutral) Conductor --- Gray
         2) Ungrounded (phase) Conductors --- Brown, Orange, Yellow
   2. Green shall be used for equipment grounding conductors only.
   3. The insulation color shall be visible for the entire length of wire.

C. Panelboard:
   1. Each Lighting and Power Panelboard shall contain a typed circuit directory listing all circuit breakers and the load served by each.
   2. Panelboard directories shall be typewritten and shall include adequate descriptions for proper identification of individual circuits. Do not write in or on panelboards.
   3. On Distribution panelboards, provide and install an engraved laminated label for each circuit, indicating circuit's number and load served.
   4. Each panelboard shall have an engraved phenolic plate permanently installed on the front of the panel with the panel name, current rating, and voltage rating.
   5. Where there is more than one nominal voltage system each panelboard shall have an engraved phenolic plate describing the means of identification used to identify each phase, neutral, and grounding conductors of the system served by the panelboard per NEC.
   6. Plates shall be white with black lettering.

D. Wall Switches: Where three or more switches are ganged, and elsewhere as indicated, identify each switch with approved legend engraved on the wall plate.

E. Receptacles: Install a label on the face of the coverplate and tags or wire markers inside the outlet box identifying the panelboard and circuit number from which the outlet is served. Use machine-printed, pressure-sensitive, abrasion-resistant label tape on face of coverplate- black print on clear tape on light colored or stainless-steel plates and white print on clear tape on dark colored plates. Embossed tape labels will not be accepted. Use durable wire markers or tags within outlet boxes.

G. Disconnect Switches:
   1. Install an engraved phenolic nameplate on the front of each switch enclosure identifying the equipment served by the safety switch and source of power (i.e., panel name and circuit number).
   2. Plates shall be white with black lettering.
   3. The plates shall be permanently installed with stainless steel screws or stainless-steel rivets. Plates installed with glue or other adhesives will not be accepted.
   4. Where motor rated switches are used as service disconnect switches, labeling shall be as described for receptacles.

H. Junction boxes: Identify circuits enclosed in concealed junction boxes on the cover with permanent marking pen.
   1. For power and lighting circuits indicate panelboard of origin and panelboard circuit number(s).
   2. For auxiliary systems circuiting indicate the system and zone served.

I. Service disconnects:
   1. An additional engraved sign shall be permanently attached next to panelboard circuit breakers, on enclosed circuit breaker enclosures, and/or on disconnect switches used as service disconnects to identify each main service disconnect.
   2. The sign shall be red with white lettering a minimum of ½" high.
   3. Where multiple main disconnects are utilized the labels shall identify each as one of a group, i.e., "Service Disconnect 1 of 3", etc. where there are three service disconnects.

3.30. SECONDARY SURGE ARRESTERS:

A. Secondary surge arresters shall be installed in strict accordance with the manufacturer's recommendations.

B. Arrester may be mounted to the side of a surface mounted panelboard or trough. If such a surface is not available, the arrester shall be mounted on a bracket in its own flush mount enclosure located immediately adjacent to the service panel. Ensure that all leads are attached per manufacturer's recommendations. Excess lead length shall be cut off prior to making connections.

3.31. CONCRETE:

A. The Electrical Contractor shall be responsible for placing concrete for electrical equipment pads, lighting standard bases, electrical equipment supports, and at other locations as indicated on the electrical drawings and/or specified herein.

B. This Contractor shall be responsible for size, location, and orientation of the pads, bases, etc. Any required additions or modifications to concrete due to incorrect size, location, or orientation shall be the responsibility of this contractor.

C. Concrete shall be cured for a period of not less than seven (7) days prior to setting poles, transformers, switchgear, motor control centers, or other pad mounted equipment.

D. Forms shall be completely removed after concrete has cured and prior to setting equipment.

E. A smooth wood float finish shall be given to exposed, unformed concrete.

F. Honeycombed, or otherwise defective areas of concrete shall be repaired by patching with cement mortar.

3.32. SPARE MATERIAL:

A. Provide two exit signs and 50 feet of circuiting in conduit for each device complete with all labor and material for installation in a location as directed by the engineer or architect.

B. Provide two emergency wall packs and 50 feet of circuiting in conduit for each device complete with all labor and material for installation in a location as directed by the engineer or architect.

C. Provide four type NEMA 5-20R receptacles complete with 75 feet of circuiting in conduit . For each device provide complete with all additional labor and materials for installation in a location as directed by the architect or engineer.

D. Provide two occupnacy sensor wall switches and their installation.

E. Provide two marked time wall switches and their installation.

F. Provide one spare set of fuses for each size and type fuse used.

3.33. EQUIPMENT TOUCHUP AND PAINTING:

A. Clean damaged and disturbed areas on all painted surfaces of enclosures, cabinets, and equipment, sand smooth, and apply primer, intermediate, and finish coats of paint to suit the degree of damage at each location. Paint shall be the manufacturer's supplied touch up paint or a matching paint. Prep all surfaces to be painted by removing all rust, dirt, oil, and any other material that might inhibit good paint adhesion by mechanical means and/or with solvents.

B. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.

C. Repair damage to galvanized finishes with two coats of zinc-rich paint recommended by manufacturer.
   1. Paint cut ends.
   2. Paint all drilled and punched holes.
   3. Paint all knicks and scratches.
   4. Paint all field cut conduit threads.

D. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

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SECTION 16315 - OVERHEAD ELECTRICAL DISTRIBUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes medium-voltage, overhead electrical power distribution **and demolition upgrading of existing overhead electrical power distribution**, and the following:

1. Conductors, connectors, and splices.
2. **Wood**] poles and crossarms.
3. Hardware and accessories.
4. Surge arresters.
5. Cutouts, switches, and fuses.
6. Distribution transformers.

1.3 DEFINITIONS

A. ACSR: Aluminum conductor, steel reinforced.

B. BIL: Basic impulse level, stated in kilovolts.

C. HDPE: High-density polyethylene.

D. RUS: Department of Agriculture, Rural Utilities Service.

E. Sag: The distance measured vertically from a conductor to the straight line joining its two points of support, measured at the midpoint of the span, unless otherwise indicated.

1. Final Sag: The sag of a conductor under specified conditions of loading and temperature applied after it has been subjected, for an appreciable period, to the loading prescribed for the loading district in which it is situated, or equivalent loading, and the loading removed. Final sag includes the effect of inelastic deformation (creep).
2. Initial Unloaded Sag: The sag of a conductor before the application of an external load.

F. Secondary: Conductors and components for circuits operating at the utilization voltage of 600 V or less.

G. Service: Set of insulated conductors extending from a pole to the metering point or service entrance connection at the location of utilization of electricity.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Conductors.
2. Poles.
3. Crossarms.
4. Insulators.
5. Switches.
6. Cutouts.
7. Reclosers.
8. Transformers.
9. Metering components.
10. Surge arresters.
11. Guy assemblies.

B. Qualification Data: For **manufacturer**.

C. Material Inspection Reports: From a qualified independent inspection agency indicating compliance of wood poles and crossarms with requirements indicated. RUS quality mark "WQC" on each item is acceptable in place of inspection as evidence of compliance.

D. Material Certificates: For the following items, signed by manufacturers:

1. Wood poles.
2. Wood crossarms.

E. Listing Documentation: Indicate products comply with RUS listing requirements specified in "Quality Assurance" Article.

F. Time-Current Coordination Curves: Illustrate optimum coordination of protective devices involved in the Work of this Section.

G. Field quality-control test reports.

H. Source Quality-Control Test Reports: Factory inspection reports of wood poles.

I. Operation and Maintenance Data: For **switches and transformers** to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Concrete Pole Manufacturer Qualifications: Certified by PCI as a qualified manufacturer of concrete utility poles of type and size indicated for this Project.

B. Inspection Agency Qualifications for Pole and Crossarm Inspection: An independent agency, acceptable to authorities having jurisdiction, qualified to conduct inspections indicated.

C. Treatment Technician Qualifications for Field Treatment of Wood Poles and Crossarms: Certified by authorities having jurisdiction over environmental protection at the location of Project for field application of chemicals required.

D. Electrical Components Normally Covered by Listing and Labeling Services: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

E. Overhead-Line Components, Devices, and Accessories: Currently listed in RUS Informational Publication 202-1 without restriction for the intended application.

F. Comply with **IEEE C2**, except where stricter requirements are indicated or where local requirements that are stricter apply.

G. Strength of Line and Line Components Selected by Contractor: Provide grades of construction and strength required by IEEE C2 for conditions encountered at Project site for **medium** line loading, unless otherwise indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Wood Pole Storage and Handling: Comply with ANSI O5.1. Do not use pointed handling tools capable of producing indentations greater than 1 inch (25 mm).

1.7 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

1.8 COORDINATION

A. Coordinate with utility supplying electricity to lines specified in this Section, and make **final connections**.

1.9 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses: **Three** additional spare fuse(s) or fuse element(s) for each furnished fuse or fuse element.
2. Special Tools: **Two** sets of special-purpose tools required for maintenance of cutouts, switches, and reclosers, complete with toolbox.
3. Insulators: **One** for every 10 of each type, but no fewer than **three** of each type.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 CONDUCTORS, CONNECTORS, AND SPLICES

A. **Available** Manufacturers - Conductors:

1. AFC Cable Systems.
2. Alcan Cable Co.
3. BICC Cables Company.
4. Brugg Telecom Inc.
5. Florida Wire & Cable, Inc.
6. General Wire & Cable Co.
7. Hendrix Wire and Cable Inc.
8. Kerite Company (The); Innovation Systems Inc.
9. King Wire Inc.
10. Nokia Cables USA Inc.
11. Northern Lights Cable, Inc.
12. Okonite Company (The).
13. Rome Cable Corp.
14. Southwire Company.

B. **Available** Manufacturers - Connectors and Splices:

1. AB Chance Co.; Hubbell, Inc.
2. Connector Manufacturing Co.
3. Cooper Power Systems.
4. Hubbell, Inc.; Anderson Electrical Products, Inc.
5. Hubbell, Inc.; Fargo Manufacturing Company.

C. Medium-Voltage Line Conductors: **Bare Aluminum Conductor, Steel Reinforced (ACSR), complying with ASTM B 232/B 232M and Hard-drawn copper (CU), complying with ASTM B 1 and ASTM B 8**.

D. Connectors, Splices, and Conductor Securing and Protecting Components: Items include wire clamps, ties, conductor armor, fittings, connectors, and terminals. Listed for the specific applications and conductor types and combinations of materials used. Descriptions as follows for various applications:

1. Copper to Copper: Copper alloy, complying with UL 486A.
2. Aluminum Composition to Aluminum Composition: Aluminum alloy, complying with UL 486B.
3. Copper to Aluminum Composition: Type suitable for this purpose, complying with UL 486B.
4. Connectors and Splices for Secondary Conductors: Listed and labeled for the conditions and materials involved in each application.
5. Taps for Medium-Voltage Line Conductors: Hot-line clamps, screw type, with concealed threads and bare, hard-drawn copper stirrups. Listed for the combination of materials being connected.
6. Splices under Tension: Compression type with strength exceeding the conductors spliced.
7. Splices and Terminations for Covered Conductors: As recommended by conductor manufacturer for conductor and covering combination and for specific materials and physical arrangement of each splice.
8. Splices and Terminations for Insulated Medium-Voltage Conductors: Comply with requirements in Division 16 Section "Medium-Voltage Cables."

2.3 WOOD POLES

A. **Available** Manufacturers:

1. Bell Lumber & Pole Co.
2. B. J. Carney & Co., Ltd.
3. Brown Wood Preserving Co.
4. GRA Services International, Inc.
5. J. H. Baxter & Co.
6. Koppers Industries, Inc.
7. McFarland Cascade.
8. Okonite Company (The).
9. Taylor Lumber & Treating.
10. Western Red Cedar Lumber Association.

B. Description: Wood poles comply with ANSI O5.1 and treated according to AWPA C4 with oil-borne preservatives and petroleum complying with AWPA P8 and AWPA P9.

C. Wood Species: Sothern Yellow Pine (SYP.

D. Pole Marking Location: 10 feet (3 m) from the pole butt for poles 50 feet (15 m) long or less.

E. Factory Operations: Machine trim poles by turning smooth, full length. Roof, gain, and bore poles before pressure treatment.

2.4 CROSSARMS

A. Description: **Solid-wood distribution type, complying with RUS REA Bulletin 1728H-701 for specified construction grade**, and IEEE C2 for required climbing space and wire clearances.

B. Braces: Galvanized, flat, ferrous-metal units; 1/4 inch (6 mm) thick by 1-/4 inches (30 mm) wide, minimum, with length to suit crossarm dimensions.

2.5 HARDWARE AND ACCESSORIES

A. Description: Ferrous-metal items include, but are not limited to, bolts, nuts, washers, crossarm gains and braces, insulator pins, anchor rods, anchors, eyebolts, staples, and transformer brackets.

1. Comply with ANSI C135.1, ANSI C135.2, ANSI C135.4, ANSI C135.14, ANSI C135.22, ANSI C135.33, and RUS Informational Publication 202-1 listings **with the exception that base material shall be malleable iron or ductile iron, and finish shall be hot-dip galvanized**.

B. Guy Strand Assemblies: Cable and attachments. Include strain insulators where indicated and if required by IEEE C2. Assemblies shall have uniform minimum breaking strength for components of each assembly.

1. Cable: Seven strand. **Zinc-coated steel, complying with ASTM A 475**] [**Aluminum-clad steel, complying with ASTM B 416**.
2. Cable Termination: Thimble eye.

C. Anchor and Anchor-Rod Assemblies: Hot-dip galvanized steel.

1. Anchors: **Expanding** type.
2. Anchor Rods for Manual Installation: Threaded rod with integral **twin** thimble eye.
3. Anchor Rods for Power-Installed Screw Anchors: ASTM A 53/A 53M, Schedule 80 pipe, with coupling, and **twin** thimble eye.

D. Guy Markers: Round vinyl or PVC material, **yellow** color, 96 inches (2440 mm) long. Shatter resistant at temperatures below 0 deg F (minus 18 deg C).

E. Insulator Brackets: Hot-dip galvanized steel, style as indicated, designed to hold vertical-post- or -pin-type insulators, with **two**-bolt attachment to pole.

F. Secondary Insulator Racks: Hot-dip galvanized steel, style as indicated, with smooth, rounded 12-gage struts designed to support **4** spool insulators for attachment of secondary drop conductors. Spool spacing **12 inches (300 mm)**.

G. Pole Riser Shields: Galvanized steel with **boot**.

H. Insulators: Units rated 6 kV and above shall be free from radio interference.

1. Porcelain insulators shall be wet-process type, complying with the following types:

a. Pin: ANSI C29.5.
b. Line Post: ANSI C29.7. Include mounting stud of length suitable for each mounting arrangement used.
c. Suspension: ANSI C29.2.
d. Guy Strain: ANSI C29.4.

e. Secondary Spool: ANSI C29.3, Class 53-2.

2. Polymer-composite, fiberglass-reinforced insulators shall comply with the following:

a. Line Post: Comply with CEA LWIG-02.
b. Dead End/Suspension: Comply with CEA LWIG-01.
c. Guy Strain: Fiberglass reinforced, epoxy finished. Designed specifically for use in guy assemblies.

I. Grounding Materials: Comply using materials listed by RUS for the intended purpose without restriction.

1. Conductors: No. 4 AWG, minimum; bare, solid, annealed copper, complying with ASTM B 8, unless otherwise indicated.
2. Ground Conductor Protectors: PVC.

2.6 SURGE ARRESTERS

A. **Available** Manufacturers:

1. Cooper Power Systems.
2. General Electric Company; Transmission Systems.
3. Joslyn Manufacturing Company.
4. Ohio Brass Company; Hubbell, Inc.
5. Tyco Electronics/Raychem.

B. Distribution-Class Surge Arresters: **Porcelain**-enclosed, gapless, metal-oxide type **with automatic-indicating type, ground-lead disconnection feature**, complying with IEEE C62.11 and NEMA LA 1.

2.7 CUTOUTS, SWITCHES, AND FUSES

A. **Available** Manufacturers:

1. ABB Inc.; Distribution Automation Equipment Division.
2. AB Chance Co.; Hubbell, Inc.
3. Cooper Power Systems.
4. S&C Electric Company.

B. Description: Medium-voltage disconnect, protective units shall be rated for the line-to-line voltage of the systems in which installed, unless higher ratings are indicated. BIL ratings **95** kV.

1. Momentary Current Rating of Switching Devices: **40** kA, asymmetrical at nominal system operating voltage.
2. Fuse Characteristics: Time-current characteristics for each set of fuses selected according to written recommendations of manufacturer of component protected by the fuses and coordinated with upstream and downstream protective devices. Prepare time-

current coordination curves according to IEEE 242 that illustrate optimum coordination of devices in this Project.

3. Interrupting Rating of Fuses: 8 symmetrical A at nominal system operating voltage.

C. Fuse Cutouts: **Open** type, rated **100** A, continuous, complying with ANSI C37.42.

1. Fuses: Enclosed link, Type **K**, complying with ANSI C37.42.
2. Fuse Current Rating: 150 percent of the transformer full-load current, unless otherwise indicated.
3. Switching Application: Include switch link instead of fuse.
4. Switch Current Interrupting Rating: **Transformer magnetizing current**

2.8 DISTRIBUTION TRANSFORMERS

A. **Available** Manufacturers:

1. ABB Inc.; Distribution Automation Equipment Division.
2. Cooper Power Systems.
3. Fortune Electric Co., Ltd.
4. General Electric Company/GE Prolec; Distribution Transformer.
5. Howard Industries, Inc.
6. Interstate Transformer, LLC.
7. Kuhlman Electric Corporation.
8. Moloney Electric; Division of Hammond Manufacturing.
9. Pioneer Power Products, Inc.
10. Transformer Network, Inc.

B. Description: Single-phase, two-winding, **two**-bushing, liquid-filled, pole-mounting distribution type; suitable for external fuse and surge suppressor protection. Comply with RUS Specification D-10**.**

C. Insulating Liquid: High-molecular weight, mineral-oil based, listed as less-flammable type.

D. Taps: **Two, 2.5 percent above and below,** high-voltage and full-load rated.

E. Mounting Brackets: **Double**, integral; suitable for pole mounting, either individually or in cluster, or on crossarm.

F. Minimum Efficiency: Class 1, as defined by NEMA TP 1, based on test results.

G. Bushings: Creepage distance shall exceed nominal value standard for unit rating by at least 75 percent.

H. Hardware: Stainless steel.

I. Tank and Cover: Stainless steel, complying with ASTM A 167, Type 304 or 304L, with paint coating exterior finish system complying with ANSI C57.12.28, including manufacturer's standard color finish coat.

2.9 SOURCE QUALITY CONTROL

A. Factory Tests: Conduct routine tests of **transformers and medium-voltage switches ac**cording to referenced standards.

B. Factory Inspections: Engage a qualified independent timber inspection agency to inspect poles and crossarms before and after preservative treatment and report results of inspection.

PART 3 - EXECUTION

3.1 RIGHT-OF-WAY CLEARANCE AND TREE TRIMMING

A. Clear right of way according to Division 2 Sections "Site Clearing" and "Tree Protection and Trimming."

B. Clear right of way to maintain minimum clearances required by IEEE C2, unless Drawings indicate greater clearances or greater clearances are required by state or local codes or regulations. If no minimum requirements are mandated, maintain a minimum of 15 feet (4.5 m) on both sides horizontally and below medium-voltage conductors and 5 feet (1.5 m) on both sides horizontally and below secondary-voltage conductors. Remove overhanging branches.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Verify dimensions by field measurement, and identify locations of poles, guy anchors, and other features. Also identify locations of connection to new and existing supply lines and to primary and secondary services. Notify Architect of discrepancies and field conditions that are not indicated and that will affect installation.

B. Ground equipment according to Division 16 Section "Grounding and Bonding."

C. Apply warning signs and equipment labels according to Division 16 Section "Electrical Identification."

3.3 CONDUCTOR INSTALLATION, GENERAL

A. Handle and string conductors to prevent cuts, gouges, scratches, kinks, flattening, or deformation. Remove damaged sections and splice conductors.

1. String new conductors to "initial" sag table values **recommended by manufacturer for type and size of conductor**.
2. Conductors Reinstalled or Resagged: String to "final" sag values **recommended by manufacturer for type and size of conductor**.

B. Connections, Splices, and Terminations: Use kits listed for the specific type of connection and combination of materials used in the connection, or recommended for the specific use by manufacturer of material on which applied.

1. Splice Location: Do not install within 10 feet (3 m) of a support.

2. Line Conductors and Service Drops: Install so strength exceeds ultimate rated strength of conductor.
3. Splices and Terminations of Covered Conductors: Comply with manufacturer's written instructions.
4. Splices and Terminations of Insulated Conductors of Self-Supported, Medium-Voltage Cable: Comply with manufacturer's written instructions.

3.4 MEDIUM-VOLTAGE LINE CONDUCTOR INSTALLATION

A. Application: Install bare conductors, unless otherwise indicated.

B. Armor Rod: Install to protect conductors if line conductors are supported by insulators.

C. Flat Aluminum Armor Wire: Install to protect conductors if they are supported by, or attached to, galvanized or coated iron or steel clamps or fittings.

D. Support line conductors and taps as follows:

1. Use wire ties for conductor attachment to pin and vertical post insulators, unless otherwise indicated.
2. Install wire ties tight against conductor and insulator, and turn ends back, flat against conductor, to eliminate exposed wire ends.
3. Use wire clamps on horizontal post, dead end, and suspension insulators, unless otherwise indicated.

3.5 POLE AND CROSSARM INSTALLATION

A. Pole Orientation: Align curve of curved wood poles with straight-line runs of three or more poles. Align gained surfaces perpendicular to runs.

B. Elevation of Line above Grade: Install poles with top at same elevation, unless grade changes dictate elevation change in poles, and according to the following:

1. On level ground, set poles so tops of consecutive poles vary not more than 60 inches (1500 mm) in elevation.
2. Shorten wood poles by cutting off the top and make cuts to shed water. Apply preservative to cuts.

C. Set poles according to the following:

1. Make pole holes vertical, uniform in diameter, and large enough to permit effective use of tamping bars all around. Bore or excavate holes with an average diameter at grade less than twice the diameter of the pole at the same grade.
2. Use minimum depths indicated, except at locations where hole is partly or entirely in rock and if hole is not vertical or has a diameter at grade larger than two times the pole diameter at the same level; in these conditions, increase the depth of the hole by the following increments before setting the pole:

a. Poles up to 35 Feet (10.6 m) Long: 24 inches (600 mm).

b. Poles 36 to 60 Feet (11 to 18.3 m) Long: 30 inches (760 mm).
c. Poles 61 to 75 Feet (18.6 to 22.9 m) Long: 36 inches (900 mm).

3. For poles on slopes, indicated hole depth is from finished grade at lowest side of hole.
4. Set poles in alignment and plumb except at dead ends, angles, and points of extra strain; rake poles against conductor strain 1 inch (25 mm) minimum, 2 inches (51 mm) maximum, (after conductors are installed at required tension) for each 10 feet (3 m) of pole length. Rake poles so they will not lean or bend in direction of strain when loaded.
5. Backfill holes in 6-inch (150-mm) maximum lifts, and thoroughly tamp each layer before starting the next.
6. Place surplus earth around pole in a conical shape, and tamp thoroughly to provide drainage away from pole.
7. Set poles so alternate crossarm gains face in alternate directions, except at terminals and dead ends; place gains on last two poles on side facing terminal or dead end.
8. Poles Set in Concrete Paved Areas: Install poles with minimum of 6-inch- (150-mm-) wide, unpaved gap between the pole and the edge of adjacent concrete slab. Fill unpaved ring with **pea gravel** to a level 1 inch (25 mm) below top of concrete slab.

D. Field treat factory-treated poles and crossarms as follows:

1. Poles Treated More Than One Year before Installation: Treat portion from 24 inches (600 mm) above ground line to butt.
2. Field-Bored Holes and Field-Cut Gains and Pole Tops: Treat cut portions.
3. Unused Holes: Treat and plug with treated-wood-dowel drive pins.
4. Engage the services of a technician certified according to Part 1 of this Section to apply treatment. Comply with requirements in AWPA standards that govern original factory treatment for field-applied treatment chemicals and application.

E. Crossarm Installation: Set line crossarms at right angle to line for straight runs and for angles 45 degrees and more. Bisect angles less than 45 degrees.

1. Buck Arms: Install at corners and junction poles, unless otherwise indicated.
2. Double Crossarms: Install at dead ends, corners, angles, and line crossings.
3. Equipment Arms: Locate below lines and set parallel or at right angles to them, whichever provides best climbing space.
4. Gains: Install factory-cut or metal pole gains only. Do not cut gains in field without specific written approval.

3.6 HARDWARE AND ACCESSORIES INSTALLATION

A. Install washers against wood and under nuts, including eyenuts and locknuts.

B. Install nuts and locknuts wrench-tight on threaded connections.

C. Install guys to resist unbalanced loads, including those developed at angles, corners, and dead ends. Install two or more guys if a single guy will not provide adequate strength. Install separate guys if unbalanced loads are separated by 36 inches (900 mm) or more.

D. Protect guy strands from damage. Replace damaged guy strands. Install guy insulators where required to comply with IEEE C2 clearance requirements and elsewhere, where indicated.

E. Select guy anchors having adequate strength and holding area to suit anchor load and soil conditions at location of that anchor.

1. Soil Anchors: Align anchors in soil with guy. Set with anchor rod pointing at guy attachment on pole and rod projecting 6 to 9 inches (150 to 230 mm) from ground.
2. Rock Anchors: Place anchors at right angles to guy, in hole drilled **12 inches (300 mm)** into solid rock, with rod projecting 4 to 6 inches (100 to 150 mm) from ground.

F. Guy Markers: Install at anchor end of guys. Clamp to guy strand or anchor at top and bottom of marker.

3.7 INSULATOR INSTALLATION

A. Medium-Voltage Line Application: Install suspension insulators type at corners, angles, dead ends, and other locations where horizontal forces exceed rated values for pin or line-post-type units.

1. Install suspension insulators and hardware that have mechanical strength exceeding rated breaking strength of attached conductors.
2. Install horizontal line-post insulators for armless construction.

B. Post-Insulator Conductor Support: Where installed horizontally and for line angles more than 15 degrees, install clamp-top conductor clamps.

C. Install spool-type insulators for secondary lines mounted on clevis attachments or secondary racks.

D. Guy Strain Type: Install **porcelain** units.

3.8 SURGE ARRESTERS

A. Install surge arresters to protect **distribution** equipment and **aerial-to-underground transitions**, and other items indicated.

1. Units Installed 6000 Feet (1800 m) or More above Sea Level: Use arresters specifically rated for this service.

3.9 CUTOUT, SWITCH, AND FUSE INSTALLATION

A. Hook-Stick-Operated Switches: Install to maximize safe operating access.

3.10 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. Furnish instruments and equipment required for tests that comply with NETA ATS.
2. Guy Anchors: Test one of each type and capacity installed. Apply rated pull-out force in the same pull direction applied by the guy at the test location.

a. Acceptable Test Results: Denoted by movement of less than 3/8 inch (10 mm) by the holding component of the anchor in the earth or other medium in which it is installed.
b. Replace or reinstall, at Architect's option, all anchors of same type and capacity as anchor type that fails this test.

3. Ground Resistance: Comply with Division 16 Section "Grounding and Bonding." Measure resistance of each separate grounding electrode, including pole grounds. Also measure resistance of separate grounding electrode systems before bonding together.

a. Perform tests and obtain acceptable results before energizing any portion of overhead electrical distribution system.
b. Results and Follow-up: If ground resistance for a single ground electrode or pole ground, tested individually, exceeds 25 ohms, add a ground electrode not less than 10 feet (3 m) away and interconnect with No. 2 AWG minimum bare conductor buried at least 12 inches (300 mm) below furnished grade.

4. Aerial Conductor Sag and Tension: Observe procedures used by Contractor to verify that initial stringing sags and tensions comply with IEEE C2 and conductor manufacturer's Product Data and written recommendations.
5. Self-Supported, Medium-Voltage Cable: After installation and while cable is isolated, after terminations are installed and before connecting or energizing, apply dc voltage between each phase conductor and grounding connections of sheath or metallic shield. Comply with applicable NEMA WC 70 for method, voltage, duration, pass-fail performance, and other test criteria. Perform other field inspections and tests recommended by manufacturer.
6. Neutral-Supported, Secondary Service Drop Cable: Test for insulation resistance while cable is isolated, before connecting or energizing. Minimum acceptable resistance is 100 megohms.
7. Existing Surge Arresters: Disconnect and measure resistance between line and ground terminals with a megger rated 600 V or more. Acceptable resistance values are 300 megohms and more.
8. New Surge Arresters, Cutouts, and Switches: Inspect after installation and connection to wiring. Verify that ratings and characteristics match approved submittals and comply with system requirements. Verify that installation complies with requirements and that clearances of units and connecting wiring comply with IEEE C2 requirements.

a. Verify proper grounding of metallic equipment parts.
b. Fuses and Disconnect Links: Verify that ratings and characteristics match submittals and comply with system requirements.
c. Switches:

1) Manually operate each cutout and switch at least three times, to verify proper operation.
2) Verify correct contact alignment, blade penetration, travel stops, and arc interrupter operation.

9. Distribution Transformers: Inspect after installation and connection to wiring and verify that ratings and characteristics match approved submittals and comply with system requirements. Verify the integrity and good condition of unit.

a. Inspect for physical damage, cracked insulators, leaks, tightness of connections, and overall mechanical and electrical integrity.
b. Perform pre-energizing inspections and tests recommended by manufacturer.
c. Verify proper equipment grounding.
d. Verify that clearances of terminals and connecting wires comply with IEEE C2.

B. Remove and replace malfunctioning units and retest as specified above.

3.11 ADJUSTING

A. Distribution Transformers: Set voltage taps as directed by Architect.

3.12 CLEANING

A. After completing equipment installation, inspect equipment. Remove spots, dirt, and debris. Repair damaged finish to match original finish. For distribution transformer, use tank touchup paint provided by manufacturer.

1. Clean enclosures internally, on completion of installation, according to manufacturer's written instructions.

3.13 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead electrical distribution. Refer to Division 1 Section "**Closeout Procedures**."

END OF SECTION 16315

SECTION 1700

GENERAL AND SPECIFIC NOTES

1. **Dimensions and Layout**: Dimensions on plan are nominal, verify exact widths from details and schedules.

   Unless dimensioned, locate door openings and other items by scale.

   Assume all dimensions extended from existing work are approximate only.

2. **Topographic Data**: Topographic features are taken from a site survey by Larry E. Speaks, Inc., 535 Herron Street, Montgomery, Alabama 36104, 334-262-1091. Assume that existing contours and other features are approximate only.

3. **Grading**: Fill, shape and dress yard area around new work so that water drains away from building and toward inlets, curbs, etc. Make adjustments in indicated grades as required to facilitate drainage, to protect tree roots, to dress out with undisturbed areas, etc. Do not unnecessarily disturb the earth.

   Schedule and conduct all operations to minimize soil erosion. Methods may include temporary construction of berms, dikes, slopes, drains, sedimentation basins, or other means to permit storm runoff with a minimum of erosion and sedimentation.

4. **Trenching**: Take care to avoid cutting tree roots. Hand excavate in areas within branch spread of existing trees and protect all roots of 1½" or greater diameter. Trenches which extend below the depth of the building foundation within a 45-degree angle of soil repose shall be excavated and backfilled prior to construction of the footing.

5. **Excavating**: In the event any excavation must be made below and immediately adjacent to existing work which is to remain, thoroughly crib and shore against the building. Assume total responsibility for, and repair of, any settling or damage to that portion of the existing structure, which is to remain. See structural drawings for underpinning requirements.

6. **Existing Site Conditions**: These site drawings reflect approximate existing conditions. Minor discrepancies shall not relieve the Contractor from completing the work in accordance with the intent set forth.

7. **Existing Trees and Shrubs**: Upon notice, the owner will remove all existing shrubs, which must be removed and are to be salvaged. The contractor shall box and protect from damage all trees and shrubs to remain which are within 25 feet of any construction activity; remove protection device upon completion of the project.

8. **Existing Utilities**: Storm pipes to be abandoned shall be removed where they occur under new structures and 5 feet beyond. Other abandoned storm pipe shall be left in place and all open ends shall be plugged solid with concrete. Inactive openings left in manholes and inlets shall be closed with 12" masonry laid with Portland cement mortar and parged over.

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9. **Coordination**: Coordinate depth, location and connection of roof drain, underdrain, storm drain and sanitary pipe stub-outs. Refer to Plumbing Drawings.

   See Plumbing, Mechanical and Electrical Drawings for related work not shown on site drawings.

   Assume indicated inverts are approximate only; verify before proceeding with work. Determine exact location and flow line at connection point of existing lines before constructing work affected thereby.

   Schedule and coordinate in advance all outages of power, water, gas etc. Hold such outages to the minimum practical.

   Do not allow debris to accumulate; keep grounds as reasonably neat as practical; take special care near entrances and other areas frequented by staff, public and visitors.

   In existing construction, coordinate all work with sub-contractors, make minor adjustments in layout of various utilities and plan work ahead of time to avoid conflicts and produce a workable system.

   Where fresh air intakes of existing air units are adjacent to construction activity, such intakes shall be closed until the activity in that area has been completed. Thereafter reopen.

10. **Fire Ratings at Walls**: Where designations for fire walls occur, extend wall up to and seal against structural deck above (seal between joists, beams, trusses, etc.). Seal around all plumbing, mechanical, electrical, etc. penetrations. Seal all voids per specification Section 0727 to make wall smoketight and to maintain fire barrier. See finish schedules and painting specs for firewall signs and finish to be applied. See ceiling plan for firewall locations. See also typical wall sections.

    One Hour Fire Wall: Where one hour fire walls are required at drywall partitions, provide 20 gauge “CH” metal studs and minimum one-layer ⅝” fire rated gypsum board one side and 1” shaft wall other side (UL# U415). Provide R-10, 2 ½” rock wool insulation in stud cavity.

11. **Life Safety**: During construction, all existing fire exits and fire protection systems must be continuously maintained unless other measures of equivalent safety are taken.

12. **Wall Heights**: Unless otherwise noted, all wood famed walls are 10’-4½” height. Fire wall shall extend to underside of roof sheeting. Seal around all beams, joists, trusses, etc. that extend through these walls. Seal voids per specification Section 0727.

13. **Floor Slopes**: Unless otherwise noted, floor slopes shall be 5%. Slope topping or setting bed where occurs. Where no topping or setting bed occurs, slope structural slab.

14. **Blocking**: Provide solid 2 x 6 blocking behind all door bumpers, millwork, toilet accessories, etc. at drywall partitions.

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15. **General Restoration and Patching**: Where damage is caused to existing lawns, shrubbery, walks, paving, utilities, mechanical and electrical systems, building elements, etc., which are to remain, restore to as good a condition as existed before work was begun. Report to the architect any defect of existing work that is to be altered or extended. Before work is started in any area, conduct a thorough survey with the architect and furnish a report listing all defects of any types which are not otherwise required to be corrected; assume responsibility for any damage not reflected by the survey.

    Perform demolition so as to avoid hazards to persons and property and to minimize interference with use of adjacent areas, interruption of utilities, etc. Provide adequate safeguards including warning signs, barricades, temporary fences, etc. to protect Owner and Contractor's personnel and the public.

    Before proceeding, examine details of new and finish work to be accommodated by demolition operations, in order to determine the appropriate scope, method of cutting, exact location, etc.

    Where existing concrete walks are cut, break back to the nearest tooled joint.

    Where cut edges of existing concrete work will be exposed in finished work, carefully patch to true line with epoxy grout patching mortar.

16. **Exposed Utilities**: Except where specifically indicated to be exposed, all new ducts, pipes, conduit, etc. in finished rooms shall be concealed above ceilings, below floors, in walls or in chases. Where no chases are indicated, provide closure to match adjacent construction and finish.

    Temporary plumbing, mechanical, electrical and sprinkler work that will be removed may be exposed.

17. **Construction Access**: Where new equipment or materials cannot be set in place through new or existing openings, provide temporary openings as required for entry. Patch and repair damage caused by temporary opening.

18. **New Openings**: Where new ducts or pipes pass through new walls and ceilings, carefully build in the openings required.

    Where new ducts or pipes pass through existing walls, floors, etc., cut openings, build in new lintels and sleeves, etc. as required; add jambs, sills, etc. to finish the opening in a quality equal to that found.

End of Section

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