ADDENDUM#1

Renovation of Commons E and G

WBA 21-034.00

TO: All Bidders DATE: 3 December 2021

This addendum forms a part of the Contract Documents and modifies the original Bid Documents dated November 8, 2021. Acknowledge receipt of this Addendum by inserting its number in the Bid Form. Failure to do so may subject Bidder to disqualification. This serves as an addendum to the construction documents and modifies and/or supplements them as follows:

I. CLARIFICATIONS & SUBSTITUTION REQUESTS

1. The attached project manual is hereby incorporated into the contract documents. This scope is to be included in the bid price.

Attachments:

1. Project Manual

END OF ADDENDUM #2

TUSKEGEE UNIVERSITY

Renovations to:
Commons Buildings E & G

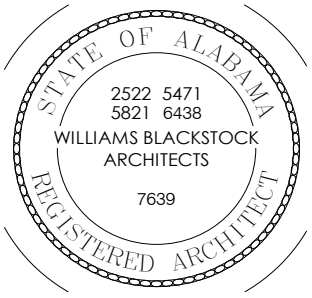
Project Manual
100% Bidding & Construction Documents

WBA No. 21-034.00

NOVEMBER 08, 2021

WILLIAMS BLACKSTOCK ARCHITECTS

SECTION 00 0107
PROFESSIONAL SEALS



11/06/21

END OF SECTION

SECTION 00 0110

TABLE OF CONTENTS

SAMPLE
INVITATION/ADVERTISEMENT
FOR BIDS

Sealed proposals will be received by _____
(Owner's legal title)

at the office of _____
(Name and address of Owner's authorized representative)

until _____ CST _____ for
(Hours) (Month), (Date), (Year)

(Description of the work to be inserted here)

at which time and place they will be publicly opened and read.

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

Drawings and specifications may be examined at the office of _____

_____
(Owner's representative and address)
and (appropriate plan rooms; i.e., F. W. Dodge, Builders Exchange, Construction Market Data, etc.).

Bid Documents may be obtained from the Architect (Engineer) upon deposit of $_____ per set, which will be refunded in full on the first sets issued to each general contract bidder submitting a bonafide bid, upon return of documents in good condition within ten days of bid date. Other sets for general contractors, and sets for subcontractors and dealers, may be obtained with the same deposit, which will be refunded as above, less cost of printing, reproduction, handling, and distribution..

(If applicable) Only general contractors who have been approved to bid pursuant to prequalification procedures and criteria established by the Owner will be eligible to bid for the Project. Written prequalification procedures and criteria are available for review at the office of _____.
(Owner's or Architect/Engineer's representative and address)

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

_____
(Awarding Authority)

_____
(Local Awarding Authority)

_____
(Architect)

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

TUSKEGEE UNIVERSITY

CAPITAL PROJECTS AND FACILITIES MANAGEMENT

Tuskegee University Commons Buildings E and G Renovation Project.

1. TYPE OF PROJECT: Commons Buildings E and G Renovation Project Request for Bids Number: 1

   DATE OF ISSUANCE: November 8, 2021

   DESCRIPTION OF SERVICES: Tuskegee University is issuing a Request for Bids to interested qualified companies to perform building renovation services located at Tuskegee University, Tuskegee, AL**.** The Project consists of renovating the interiors of two residential buildings, **Commons Apartment Buildings E and G,** located on the campus of Tuskegee University. Buildings E and G are 3-story structures, and each consist of twelve 4 BR units (4 units on each floor). There are a total of 24 units. The buildings each show signs of water damage, as well as potential foreign materials and structural damages as a result of the water damage. Roofing replacement for Commons Building E is included in this project scope. Roofing scope for Commons Building G is covered under a separate contract and is outside of this project scope.

   CONTACT PERSON: **Jamillah McCray**, ***email: jmccray@tuskegee.edu***

   MANDATORY PRE-BID MEETING: **December 3, 2021 2:00pm cst.** ***John A. Kenny Hall, Tuskegee University, 1200 West Montgomery Rd. Tuskegee, AL. 36088-1346.***

   LAST DAY FOR QUESTIONS: December 9, 2021

   SUBMISSION DEADLINE: **December 16, 2021**

   SUBMISSION ADDRESS: **Kresge Center Room 116 (Purchasing Office), Tuskegee University, 1200 West Montgomery Rd. Tuskegee, AL. 36088-1346**

   BID OPENING ADDRESS: **Kresge Center Room 201 (Conference Room), Tuskegee University, 1200 West Montgomery Rd. Tuskegee, AL. 36088-1346**

   Sealed bids will be accepted at **2:30pm Kresge Center Room 116 (Purchasing Office), Tuskegee University, 1200 West Montgomery Rd. Tuskegee, AL. 36088-1346**. Mail in a bid package prior to the date and time noted above to the attention of ***Jamillah McCray, Purchasing Department,*** **Kresge Center Room 116 (Purchasing Office), Tuskegee University, 1200 West Montgomery Rd. Tuskegee, AL. 36088-1346,** late submissions will not be accepted. Contractors must be licensed

by the General Contractors Licensure Board of Alabama and meet the statutory requirements including liability, workers compensation insurance and maintaining a license in good standing. All bidders must include a current license number with the submission of the bid.

The responsibility for submitting a response to this Request for Bid to Tuskegee University, **on or before the stated time and date**, will be solely and strictly the responsibility of the Bidder. Tuskegee University is not liable for any costs incurred by the Bidder prior to issuance of a contract. The Bidder shall wholly absorb all costs incurred in the preparation and presentation of the bid.

The contractor will have and maintain all required licenses necessary to conduct business in the City of Tuskegee and Macon County, Alabama and any specialty licenses required to perform required work listed in this Request for Bid. Copies of all licenses and insurance must be on file in the Purchasing Office of Tuskegee University, prior to contractor starting work.

The company must certify/show proof of workers compensation, general liability (minimum coverage of $1,000,000 per occurrence) and auto liability ($1,000,000 per occurrence). Insurance coverage must be maintained throughout the term of the contract. Copies of all proof of insurance must be on file in the Purchasing Office prior to contractor beginning work. A cashier check or bid bond payable to Tuskegee University in the amount of not less than five (5) percent of the amount of the bid, but not more than $10,000.00, will be required prior to the release of the "Notice to Proceed" to the successful bidder. Successful bidder will be required to furnish and pay satisfactory Performance and Payment Bonds equal to the amount of the contract.

Bid Requirements: ▪ Provide proof of business licenses, insurances, and references ▪ Provide list of qualified persons to perform specified jobs ▪ Provide a timeline for job completion ▪ Providing all other things being equal, the contract will be awarded to the lowest/responsible bidder. If the lowest bidder declines the offer, the contract will be offered to the next lowest bidder, and so on ▪ Contractor warranty must be in place for one year on all workmanship ▪ All equipment warranties must be given to Tuskegee University.

Bids must be submitted in a sealed envelope that shows the company's name, address and (AL) License Number clearly written on the outside of the sealed envelope. All bids must be submitted in accordance with the conditions and instructions provided herein. All bids must remain open for acceptance for ninety (90) days.

Bidder must agree to pay their employees not less than the minimum wage rates for Commercial work prescribed by General Decision Number: AL180111, dated January 3, 2019. In addition, certified weekly payroll forms will be required.

Payment Request Requirement: Contractor promise and agree that it will be responsible for all workmen employed or engaged by it in the performance of the contract, that it will comply with the provisions of the **Davis-Bacon Acts,** and that it will be responsible for complying with all Federal and State laws and regulations pertaining to the withholding of income taxes, Social Security and unemployment compensation payment of its employees.

Renovation of Commons Buildings E & G

for
Tuskegee University
in
Tuskegee, Alabama

CRITERIA FOR PREQUALIFICATION OF CONTRACTORS

The purpose of having criteria is to set a measure by which contractors shall be judged to be prequalified. This is a set of criteria that shall be added to or taken away from depending on the construction job being bid.

The below are the criteria that shall be used to prequalify bidders for this project. Failure to submit all and complete answers will be grounds for Tuskegee University to not qualify said contractor. All answers shall be in the order below. **DO NOT** write on this form. Use as many pages to submit as needed. The term "Organization" is meant to include any related organization(s) as defined by the IRS. A score of **75% of total available points** is required to be pre-qualified. This form shall be returned with your answers.

Prerequisites (0 pts)

All of the following prerequisite items must be satisfied in order for the applicant organization to be considered prequalified.

1. Bidders must be licensed under terms of existing State laws. License classification must correspond to bid package for which prequalification is requested.
2. In case of a joint venture of two or more Contractors, the amount for the bid shall be within the maximum bid limitations as set by the State Licensing Board for General Contractors of at least one of the partners to the joint venture.
3. If the bidder is a corporation organized in a state other than Alabama, it shall furnish a certificate from the Alabama Secretary of State showing that it is qualified to transact business in Alabama and shall be registered with Alabama Department of Revenue.

Company Information (Maximum 12 pts)

The intent of this section is to obtain the general information for the applicant organization. Points will be awarded based on the completeness of this section.

1. List organization information including Company Name, Mailing Address, Street Address, City, State, Zip, Telephone Number, and Fax Number.
2. Provide Federal Identification Number. Attach copy of W-9 form.
3. Provide State Contractor License Number. Attach copy of license.
4. Indicate formal organization structure (Corporation, Partnership, Individual, Joint Venture, or Other) and the State and date it was organized as such.
5. List special programs (SB, HZSB, SDB, WOSB, VOSB, SDVOSB, Other, None) of which your organization is a member. Attach copy of certificate for each.
6. List names and titles for organization Officers, Owners, and/or Partners. Include resumes' for each.
7. If a subsidiary of another company, provide name and address of parent company.
8. Provide length of time your organization has been in business under its current name and length of time under other previous name(s).
9. Indicate method of organization operation (Closed Shop, Open Shop, Merit Shop).
10. List work categories in which your organization is legally qualified to do business. Indicate which your organization normally performs with its own work force. You must qualify for each of these if the Owner requires prequalification for such trade.
11. List number of current full-time employees, project managers, superintendents, and estimators.

Bonding, Financial, and Insurance Information (Maximum 40 pts)

The intent of this section is to determine the overall financial strength of the applicant organization. Points will be awarded based on the completeness of this section and the

reviewer's evaluation of the effect the information provided could potentially have on the organization's ability to perform on this project.

12. List Surety Company information including Company Name, Street Address, Phone number, and Agent Name.
13. Provide Surety Company Best's Financial Strength Rating and Best's Financial Size Category. Must be "A-VII" or higher.
14. Provide bond premium rate(s).
15. List Bank information including Bank Name, Address, City, State, Zip, Account Executive Name, Telephone Number, Types of Accounts, and Line of Credit Amount(s).
16. Provide copy of your latest audited, reviewed, or compiled Financial Statement (Income Statement and Balance Sheet) that includes current assets, total assets, current liabilities, long term liabilities, equity, revenue, gross profit, and net income. Audited or Reviewed statements are preferred. Statements must be current and prepared according to GAAP. Statements will be reviewed for proper liquidity and no serious liabilities.
17. Provide total volume of sales and/or work performed for each of the previous five years.
18. Has your organization or any current officer of your organization, if not a corporation, filed bankruptcy under Chapter(s) 7, 11, or 13 as defined by the IRS? If yes, please give pertinent details.
19. List Insurance Company information including Agency Name, Address, City, State, Zip, and Telephone Number.
20. Provide Insurance Company Best's Financial Strength Rating and Best's Financial Size Category. Must be "A-VII" or higher.
21. List any coverage that has been cancelled by an Insurance company in the past five (5) years and the reason for such cancellation.
22. Attach a copy of your standard Certificate of Insurance (ACORD form) indicating policy coverages and limits.

****Note – All subcontractors will be required to be bonded on this project****

Litigation and Claims (Maximum 10 pts)

The intent of this section is to determine the extent to which any pending litigation or claims involving the applicant organization could adversely affect this project. Points will be awarded based on the completeness of this section and the reviewer's evaluation of the affect that such claims and litigation could potentially have on the organization's ability to perform on this project.

23. Are you or any officers, stockholders, key members, or any related companies presently involved in any litigation or disputes, or any judgments pending or rendered? If yes, please give pertinent details and outcomes(s).
24. Has your organization within the past five (5) years filed any lawsuits or requested arbitration or mediation proceedings in regard to any of its construction contracts? If yes, please give pertinent details and outcomes(s).
25. Is your organization currently and directly involved in a lawsuit, arbitration, or alternative dispute resolution proceedings with the City of Tuskegee?

Past/Relevant Experience (Maximum 50 pts)

The intent of this section is to ascertain the applicant organization's experience in general and with projects of similar size and scope. Points will be awarded based on the completeness of this section and the reviewer's evaluation of the effect that the information provided could potentially have on the organization's ability to perform on this project.

26. List your major construction projects (minimum of five) completed in the last five (5) years. Include Project Name, Location, Contract Amount, Owner Name, Architect Name, Bid/Negotiated, and Bonded/Unbonded for each.
27. List all relevant projects (minimum of three) your organization has completed within the past five (5) years that are of similar size, type and scope to this project. Include Project Name, Location, Contract Amount, Owner Name, Architect Name, Bid/Negotiated, and Bonded/Unbonded for each.
28. Has your organization ever failed to complete any work awarded to it? If yes, please give pertinent details and outcome(s).
29. Has any officer in your organization with the past five (5) years ever been an officer of an organization that failed to complete a construction contract? If yes, please give pertinent details and outcome(s).
30. List proposed Project Manager and Superintendent. Attach resume' for each.
31. List five (5) Trade (credit) references with whom your organization has done business in the past five (5) years. Include Company Name, Contact Name, Address, and Telephone Number.
32. List your organization's experience working on sites with highly restricted access.

Current Capacity and Ability to Complete this Project (Maximum 20 pts)

The intent of this section is to verify that applicant organization will not be over-extended with regard to resources such as staffing and bonding capacity. The reviewer will evaluate the information provided in conjunction with the anticipated contract value, contract start date, contract completion date and possible resource needs of the project. The information will also be utilized to complete reference checks. Points will be assigned based on the reviewer's evaluation of the effect that the information provided could potentially have on the organization's ability to perform on this project.

33. List all your major construction projects currently in progress (miminum of five). Include Project Name, Location, Contract Amount, Percent Complete, Owner Name, Architect for each.
34. Give total amount of work currently in progress.
35. Give total amount of work currently under contract.
36. Provide dollar amount of bonded work on hand and percent of bonded work to total work.
37. Provide your bonding capacity per project and in the aggregate.
38. Provide evidence from Surety Company of adequate available bonding capacity for this project.

Drug and Safety Programs (Maximum 20 pts)

The intent of this section is to determine the thoroughness and effectiveness of the applicant organization's established corporate policies and procedures regarding drugs and safety. Points will be assigned based on the reviewer's evaluation of the effect that the

information provided could potentially have on the organization's ability to perform on this project.

39. Provide a description of your written programs for Drug and Criminal Background Checks.
40. Provide a description of your written program for Safety.
41. List your organization's Experience Modifier Rate for the previous year and provide supporting documentation. List any claims you have had since December 31st of the previous year. (EMR equal to or less than .80 = 10 pts; between .81 – 1.0 = 7 pts; greater than 1.0 = 0 pts.)
42. Provide copy of latest OSHA 300 Log indicating Total Recordable Injuries and Illnesses, Man-Hours worked, Incident Rate and Number of Lost Time Accidents.

Scheduling and Quality Control Program (QAQC) (Maximum 20 pts)

The intent of this section is to determine the applicant organization's competency with regard to Scheduling and Quality Control. Points will be awarded based on the reviewer's evaluation of the effect that the information provided could potentially have on the organization's ability to perform on this project.

43. Provide a description of your written program for Scheduling. Applicant should define means or methods utilized when scheduling projects (i.e. outsourced, in-house), describe means for schedule recovery, and provide any examples of projects where schedule adversities were overcome.
44. Provide a description of your written program for Quality Control/Assurance. Demonstrate how existing program benefits the project's durability and appearance; and how it aids in supervisory personnel's ability to comply with contract requirements (i.e. plans and specifications).

ATTACHMENT "A"

CURRENT EXPERIENCE SUMMARY

PROJECT NAME: _____

_____

OWNER: _____

OWNER'S ADDRESS: _____

_____

OWNER CONTACT: _____

OWNER TELEPHONE No: _____

ARCHITECT: _____

ARCHITECT'S ADDRESS: _____

_____

ARCHITECT CONTACT: _____

ARCHITECT TELEPHONE #: _____

CONTRACT BID AMOUNT: _____

CONTRACT START DATE: _____

CONTRACT END DATE: _____

CONTRACT TIME: _____ DAYS

PERCENTAGE OF WORK TO BE PERFORMED BY OWN FORCES: _____%

DESCRIPTION OF WORK PERFORMED:

_____

_____

_____

_____

_____

_____

_____

_____

ATTACHMENT "B"

RELEVANT EXPERIENCE SUMMARY

PROJECT NAME: _____

_____

_____

OWNER: _____

OWNER'S ADDRESS: _____

_____

OWNER CONTACT: _____

OWNER TELEPHONE No: _____

ARCHITECT: _____

ARCHITECT'S ADDRESS: _____

_____

ARCHITECT CONTACT: _____

ARCHITECT TELEPHONE #: _____

CONTRACT BID AMOUNT: _____

COMPLETED CONTRACT AMOUNT: _____

CONTRACT START DATE: _____ END DATE: _____

CONTRACT TIME INCLUDING CHANGE ORDERS: _____ DAYS

CONTRACT TIME USED: _____ DAYS

COMPLETION DATE: _____

PERCENTAGE OF WORK PERFORMED BY OWN FORCES: _____%

DESCRIPTION OF WORK PERFORMED:

_____

_____

_____

_____

_____

_____

_____

PROPOSAL FORM

To Tuskegee University Date: _____
: (Awarding Authority)

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

_____
(Legal Name of Bidder)

hereby proposes to furnish all labor and materials and perform all work required for the construction of

_____

_____
(Description of work)

in accordance with Scope of Work and Specifications, dated _____ prepared by

_____ Architect/Engineer.

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

ls: □ a Corporation □ a Partnership □ individual □ (other)

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

_____

_____

_____

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

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

BASE BID: For construction complete as shown and specified, the sum of _____

_____ Dollars ($)

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

For Alternate No. 1 (_____) (add)(deduct) $ _____
For Alternate No. 2 (_____) (add)(deduct) $ _____
For Alternate No. 3 (_____) (add)(deduct) $ _____
For Alternate No. 4 (_____) (add)(deduct) $ _____
For Alternate No. 5 (_____) (add)(deduct) $ _____
For Alternate No. 6 (_____) (add)(deduct) $ _____

UNIT PRICES - (See Attachment)

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

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

☐ Bid Bond, executed by _____ as Surety,

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

for the sum of

_____ Dollar

s made payable to the Awarding Authority.

BIDDER'S ALABAMA LICENSE:
State License for General Contracting: _____
License Number Bid Limit Type(s) of Work

CERTIFICATIONS: The undersigned certifies that he or she is authorized to execute contracts on behalf of the Bidder as legally named. that this proposal is submitted in good faith without fraud or collusion with any other bidder, that the information indicated in this document is true and complete, and that the bid is made in full accord with State law. Notice of acceptance may be sent to the undersigned at the address set forth below. The Bidder also declares that a list of all proposed major subcontractors and suppliers will be submitted at a time subsequent to the receipt of bids as established by the Architect/Engineer in the Bid Documents but in no event shall this time exceed twenty-four (24) hours after receipt of bids.

Legal Name of Bidder _____

Mailing Address _____

*By (Legal Signature) _____

*Name (type or print) _____ *{Seal)*

*Title _____

*Telephone Number _____

If the 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.

CONSTRUCTION AGREEMENT

This AGREEMENT is made and entered into this ____ day of _____ , 2019, by and between Tuskegee University, 204 Kresge Center, Tuskegee, AL 36088, hereinafter referred to as "Owner", and CONTRACTOR NAME AND ADDRESS ARE ENTERED HERE, hereinafter referred to as the "Contractor", as follows:

1. For and in consideration of the payment by Owner as hereinafter provided, Contractor does hereby contract and agree to construct, install or perform, in accordance with the plans, specifications, requirements and/or directions furnished by Owner in a mandatory pre-bid walk-through and the bid documents (as amended through addenda), the following: PROJECT NAME AND DESCRIPTION ENTERED HERE. More specifically, the Contractor shall perform the work in accordance with the requirements set forth in the attached exhibits: LIST ALL APPLICABLE EXHIBITS HERE AND ATTACH TO CONTRACT. In the event of a conflict between this Agreement and these exhibits, this Agreement shall control. The Contractor hereby represents that it, and its subcontractors, have performed all necessary building inspections and field measurements for adequately pricing the work under this Agreement and that it fully accepts the condition of the buildings "as is" for the performance of its work.

2. For the above described work, as and when performed to Owner's satisfaction, Owner agrees to pay CONTRACTOR by monthly progress payments the total sum of CONTRACT PRICE IS TO BE SPELLED HERE ($0000000). Owner will withhold ten percent (10%) retainage on the first fifty percent (50%) of the work until final acceptance. Contractor will furnish Owner with partial lien waivers/releases and pay certifications on Owner approved forms with each draw request and will receive payment within thirty (30) days of proper and accurate submission of payment documentation for any approved work. Prior to release of retainage, Contractor will furnish Owner with (a) a standard one (1) year written warranty for labor and materials, any special warranties indicated by the plans, specifications and Owner requirements or directions, and any warranties otherwise available for equipment, materials, services and systems installed, (b) all O & M manuals, (c) Final Lien Waivers/Releases from Contractor, any subcontractor and any material suppliers, all on forms supplied by and satisfactory to the Owner, and (d) any other close-out certifications, government approvals or documents required by Owner.

3. Contractor shall promptly make payments to all persons supplying the Contractor with labor, tools, supplies and equipment used or to be used in the prosecution of the work or in connection therewith. Any payments not so made by the Contractor when earned or due may be made by the Owner and the amounts thereof deducted from any moneys at any time earned or due the Contractor under this agreement. Furthermore, Contractor and its surety shall hold and save the Owner harmless from any and all claims, actions, suits or liens by any such persons. Contractor hereby waives and releases any lien or right of lien it may assert against the improved property, the Owner or any contract funds as provided by law or in equity.

4. All construction and work performed hereunder by Contractor and its employees, if any, shall be in strict accordance with the plans, specifications, requirements and directions

furnished by the Owner. Contractor shall, at Contractor's expense, comply with the Owner's clean-up, operational and other facility procedures and at all times keep the facility and premises free from debris and unsafe conditions resulting from the Contractor's Work. Contractor shall give adequate notices to any and all authorities pertaining to the Contractor's Work and secure and pay for all permits, fees, licenses, assessments, approvals, inspections and taxes necessary to complete the Contractor's Work.

5. Contractor shall make all alterations, additions, deletions or changes, and perform all extra work or omit any work that the Owner may specifically require in writing, and at a reasonable addition to or deduction from the contract price set forth herein. NO EXTRA WORK, ALTERATIONS OR CHANGES SHALL BE MADE, HOWEVER, EXCEPT UPON WRITTEN ORDER FROM OWNER, AND OWNER SHALL NOT BE HELD LIABLE TO CONTRACTOR FOR ANY EXTRA WORK, ALTERATIONS OR CHANGES FURNISHED WITHOUT SUCH WRITTEN ORDER. NO OFFICER, EMPLOYEE OR AGENT OF OWNER HAS ANY AUTHORITY TO DIRECT ANY EXTRA WORK ALTERATIONS OR CHANGES BY ORAL ORDER.

6. Time is of the essence in Contractor's performance of its work, and Contractor shall perform according to the schedule furnished by Owner. The work shall commence on MONTH DAY YEAR and shall be substantially complete by MONTH DAY YEAR. Any punch list work shall be completed to Owner's satisfaction within ten (10) days of substantial completion. The schedule can be updated or revised by the Owner in writing, and the Contractor shall perform accordingly. Should Contractor be delayed in its completion through no fault of its own, its subcontractors or vendors, it will only be entitled to a commensurate extension of time in the schedule, and Contractor hereby waives and releases any monetary claim for delay, disruption, inefficiency, impact or suspension. **It is hereby agreed that, for each calendar day that the work is not substantially complete by the scheduled completion date, Contractor, and its surety, shall pay Owner as liquidated damages the following: $00 per calendar day for DESCRIPTION OF LD'S.** At its sole discretion, the Owner may withhold such damages from any payments due Contractor under this Agreement.

7. (a) Contractor shall at all times supply sufficient tools, equipment, materials, supervision, subcontracted services and labor to meet the then-current Owner approved project schedule. In addition to all other remedies available to it under this Agreement or the law, to the extent the Owner believes that the progress of the Work is such that the completion date, as adjusted for time extensions provided elsewhere in this Agreement, will not be met due to the fault or cause of Contractor or its subcontractors, suppliers, consultants, agents and employees, the Owner may direct Contractor in writing to take such steps as Owner deems necessary to improve Contractor's progress, all without additional cost or fee to the Owner. Such steps may include, but shall not be limited to, increasing the number of shifts, adding overtime operations, increasing the labor force and/or supervision, working holidays and weekends and adding equipment and operators. Such an acceleration shall be separately accounted for by Contractor. If Contractor reasonably believes that acceleration is not justified under the terms of this clause, it shall so advise Owner in writing within three (3) calendar days of receipt of the directive to accelerate. In such case of objection, Contractor may expressly reserve its right to claim a

compensable acceleration under paragraph (b) below, but nevertheless must proceed with the acceleration as directed.

(b) In the event the progress of the Work is on schedule for meeting the completion date, as adjusted for time extensions provided elsewhere in this Agreement, the Owner reserves the right to direct Contractor to accelerate its progress as a change in the Work and with compensation as provided in paragraph 5 hereof. Reasonable costs of such acceleration shall be separately accounted for by Contractor.

8. Contractor promises and agrees that it will be responsible for all workmen employed or engaged by it in the performance of this contract, that it will comply with the provisions of the Davis-Bacon Acts, and that it will be responsible for complying with all Federal and State laws and regulations pertaining to the withholding of income taxes, Social Security and unemployment compensation payments of its employees. Contractor will furnish Owner a Certificate of Insurance, performance and payment bonds, and evidence of required general contractor licensing, all acceptable to Owner, at the time of execution of this Agreement. Contractor warrants and agrees that it and its employees shall at all times observe and comply with all applicable laws and regulations of the United States and of any state, county, or city having jurisdiction of the place where any word hereunder is being done.

9. It is expressly agreed by and between the parties hereto that the Contractor is an independent contractor and said Contractor shall not be deemed or construed to be an employee or agent of Owner.

10. Contractor agrees to fully comply with the Occupational Safety & Health Act of 1970 and successive legislation and any and all regulations issued pursuant thereto. Contractor shall defend, indemnify and hold Owner harmless from any claims or charges of any kind by reason of Contractor failing to fully comply with the Act and its regulations, and agrees to reimburse the Owner for any fines, damages, or expenses of any kind incurred by the Owner by reason of the Contractor's failure to comply. Contractor shall be solely responsible for project safety and is solely responsible for the safety of its own employees.

11. Contractor hereby represents, warrants and covenants to Owner as follows: Contractor (i) has complied, and shall at all times during the term of this agreement comply, in all respects with all immigration laws, statutes, rules, codes, orders and regulations, including, without limitation, the Immigration Reform and Control Act of 1986, as amended, and the Illegal Immigration Reform and Immigrant Responsibility Act of 1996, as amended, and any successor statutes thereto, (ii) has properly maintained, and shall at all times during the term of this agreement properly maintain, all records required by the United States Citizenship and Immigration Services (the "USCIS"), including, without limitation, the completion and maintenance of the Form I-9 for each of Contractor's employees, and (iii) has responded, and shall at all times during the term of this agreement respond, in a timely fashion to any inspection requests related to such I-9 Forms.

12. To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless Owner and all of its agents, officers, board members, managers, representatives and employees from and against all claims, damages, fines, penalties, losses, and expenses, including but not limited to, court costs, and reasonable attorneys fees, arising out of, related to or resulting from the performance of the Contractor's work or the Contractors' failure to perform its obligations under this Agreement or the Contractor's failure to comply with applicable laws and regulations, regardless of whether such claims, damages, losses, and expenses are caused by, or are alleged to be caused by, in whole or in part, the acts, omissions or negligence of a party indemnified hereunder.

13. If the Contractor refuses or fails to supply enough properly skilled workers, competent supervision, or proper materials, to maintain the schedule of work, or to make prompt payment to its workers, subcontractors, or suppliers, or if the Contractor disregards laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction, or otherwise is responsible for a material breach of this Agreement, and thereafter fails within three (3) working days after receipt of written notice from Owner to commence and continue satisfactory correction of such default with diligence and promptness, then the Owner, without prejudice to any others rights or remedies, shall have the right to terminate Contractor's employment under this Agreement and withhold payment of any monies due the Contractor pending corrective or curative action to the extent required by and to the satisfaction of the Owner. All of the costs incurred by the Owner in completing or correcting the Contractor's work, including overhead, profit, court costs and reasonable attorney's fees, shall be deducted from any monies due or to become due the Contractor from Owner and shall otherwise be reimbursed by the Contractor and its surety.

14. Owner may expressly order the Contractor in writing to suspend, delay, interrupt, or terminate all or any part of the Contractor's work for such period of time as may be determined to be appropriate for the convenience of the Owner. In such event, Owner shall not be liable for unearned anticipated profit on the Contractor's work not performed as of the termination date, nor shall Owner be liable to the Contractor for any delay, impact, consequential, indirect, or other damages.

~~15. The Owner has received an abatement or exemption for sales and/or use taxes on this project for materials, supplies and/or equipment purchased for, delivered to and utilized on this project; and the Owner desires to take full advantage of such savings. Therefore, on behalf of the Owner, the Contractor is obligated to accomplish all available sales and use tax abatements or exemptions in the purchasing of such items by Contractor, its subcontractors, sub-subcontractors or vendors. Contractor agrees to execute and administer any documents and procedures necessary to accomplish the abatement or exemption, including, but not limited to, execution and administration of an appropriate purchasing agent agreement with the Owner. Upon completion of the project, or at Owner's discretion periodically throughout the project, deductive change order(s) will be issued to Contractor removing from the contract price all sales and/or use tax that was, or could have been, avoided. Where not otherwise indicated, the Alabama Building Commission Guidelines and Forms for Tax Savings Arrangements should be used for guidance and reference.~~

16. All claims, disputes and any other matters in question between Owner and the Contractor arising out of or relating to this Agreement, at the sole election of the Owner, shall be decided by binding arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. The location of the arbitration proceeding shall be Montgomery, Alabama. The award rendered by the arbitrator(s) shall be final and binding, and judgment may be entered thereon in accordance with applicable law in any court having jurisdiction thereof.

17. This Agreement represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations or agreements, either written or oral. There shall be no modification of this Agreement, except in writing, signed by both parties, executed with the same formalities as with original instrument.

Witness this ____ day of _____, 2019.

TUSKEGEE UNIVERSITY (OWNER)

By: _____
Its: _____

CONTRACTOR LEGAL NAME HERE_____ **(CONTRACTOR)**

By: _____
Its: _____

Federal ID# _____ or
Social Security #_____
General Contractor's License # _____ (if over $50,000)

JOB#_____

Attachments:

LABOR AND MATERIAL BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____, Principal, and _____, Surety, are held and firmly bound unto Tuskegee University (hereinafter called the Obligee) in the penal sum of _____ ($_____) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, personal representative, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Principal has entered into a certain contract with said Obligee, dated March ____, 2019 (hereinafter called the "Contract") for the _____Project, the Contract for said work shall be deemed a part hereof as fully as if set out herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal and all subcontractors to whom any portion of the work provided for in the Contract is sublet and all assignees of said Principal and of such subcontractors shall promptly make payment to all persons supplying him or them with labor, materials, food-stuffs, equipment or supplies for or in the prosecution of the work provided for in the Contract or in any approved change order to the Contract, and for the payment of reasonable attorney fees as allowed by law, incurred by the claimant or claimants in suits on said bond, then the above obligation shall be void; otherwise to remain in full force and effect. PROVIDED, however, that this bond is subject to the following conditions and limitations.

(a) Any person, firm, or corporation that has furnished labor, materials, food-stuffs, equipment or supplies for or in the prosecution of the work provided for in the Contract shall have a direct right of action against the Principal and Surety on this bond, which right of action shall be asserted in a proceeding, instituted in the County in which the work provided for in the Contract is to be performed. Such right of action shall be asserted in a proceeding instituted in the name of the claimant or claimants against said Principal and Surety or either of them (but not later than one year after the final settlement of the Contract) in which action such claim or claims shall be adjudicated and judgment rendered thereon.

(b) The Surety shall not be liable hereunder for any damages or compensation recoverable under any workman's compensation or employer's liability statue.

(c) In no event shall the Surety be liable for a greater sum than the penalty of this bond or subject to any suit, action, or proceeding thereon that is instituted later than one year after the final settlement of the Contract.

This bond has been executed in _____ counterparts.

SIGNED, SEALED, AND DELIVERED, this _____ of _____, 2019.

(INDIVIDUAL PRINCIPALS SIGN HERE)

_____

(SEAL)

_____

(SEAL)

_____

(SEAL)

_____

(SEAL)

(CORPORATE PRINCIPAL SIGN HERE)

(CORPORATE SEAL)

_____

BY: _____

Its: _____

ATTEST:

_____

SECRETARY

(SURETY SIGN HERE)

(SURETY'S CORPORATE SEAL)

_____

BY: _____

Its: _____

ATTEST:

_____

PERFORMANCE BOND

KNOW ALL MEN: That we _____
(Insert the name and address of Principal)

(hereinafter the "Principal") and

_____
(Insert the name and address or legal title of one or more Sureties)

(hereinafter called the Surety or Sureties), are held and firmly bound unto Tuskegee University (hereinafter called the "Owner") in the sum of _____ ($_____) for payment whereof the Principal and the Surety or Sureties bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly, by these presents.

WHEREAS, the Principal has, by means of a written agreement, dated March ____, 2019 (the "Contract"), entered into a contract with the Owner for the Tuskegee University _____ Project, the Contract is by reference made a part thereof:

NOW, THEREFORE, the condition of this obligation is such that if the Principal shall faithfully and fully perform the Contract on its part, and satisfy all claims, liens and demands incurred for the same and shall fully indemnify and save harmless the Owner from all costs, fees and damages which it may suffer by reason of Principal's failure to do so and shall fully reimburse and repay the Owner all outlay and expense, including, but not limited to, attorney's fees and any liquidated damages, which the Owner may incur as a result of or in making good any such default, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

PROVIDED further that the said Surety or Sureties, for value received, hereby stipulate and agree that no change, extension of time, alteration or addition to the terms of the Contract concerning the work to be performed thereunder or the specifications accompanying the same shall in any way affect their obligations on this bond; and they do hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the contract or to the work or to the specifications.

This bond has been executed in _____ counterparts.

Signed and sealed this ____ day of _____, 2019.

In the presence of:

_____

(INDIVIDUAL PRINCIPALS SIGN HERE)

_____

(SEAL)

_____

(SEAL)

_____

(SEAL)

_____

(SEAL)

CORPORATE PRINCIPAL:

_____

_____

BY:

_____

Its:

_____

(CORPORATE SEAL)

SURETY:

_____

BY:

_____

Its:

_____

SURETY'S CORPORATE SEAL

SURETY:

_____

BY:

_____

Its:

_____

SURETY'S CORPORATE SEAL

APPENDIX A

TUSKEGEE UNIVERSITY
VENDOR MEDIATION & ARBITRATION AGREEMENT

Disputes: Mediation & Arbitration. (a) Any controversy or claim arising out of or relating to this vendor agreement, or the breach thereof, the parties hereto shall first attempt to settle the dispute by mediation, administered by the [American Arbitration Association] under its [Mediation Rules]. If settlement is not reached within sixty days after service of a written demand for mediation, any unresolved controversy or claim shall be settled by arbitration administered by the American Arbitration Association (AAA) in accordance with its Commercial Arbitration Rules. The mediation and arbitration hearing(s)respectively shall take place in the State of Alabama in a city agreed upon at the time by the parties before a single arbitrator. Judgment on the award rendered by the arbitrator may be entered in any court having jurisdiction thereof. The arbitrator shall be a practicing lawyer having at least 15 years of experience in commercial business law related matters or a retired judge.

No demand for mediation or arbitration may be made after the date when the institution of legal or equitable proceedings based on such claim or dispute would be barred by the applicable statute of limitations. Each party shall bear its own costs, fees, and expenses of mediation and/or arbitration.

(b) A party may apply to the arbitrator seeking injunctive relief until an arbitration award is rendered or the dispute is otherwise resolved. A party also may, without waiving any other remedy, seek from any court having jurisdiction any interim or provisional relief that is necessary to protect the rights or property of that party pending the arbitrator's appointment or decision on the merits of the dispute.

(c) The arbitrator shall issue a reasoned award. The arbitrator shall only require the parties to disclose documents that they intend to rely on in presentation of their case at the hearing. Judgment upon the arbitrator's award may be entered in any court having jurisdiction. The mediation and/or arbitration proceedings and any resultant mediation or arbitration award shall be maintained by the parties as strictly confidential, except as is otherwise required by court order or as is necessary to confirm, vacate or enforce the award and for disclosure in confidence to the parties' respective attorneys, tax advisors and senior management and to family members of a party who is an individual.

(d) If any provision of this Agreement or the application thereof is held invalid, the invalidity shall not affect other provisions or applications of the Agreement which can be given effect without the invalid provisions or applications and to this end the provisions of this Agreement are declared to be severable.

Tuskegee University
Authorized Representative:

_____

Date:_____

Vendor's Authorized Representative

_____

Date:_____

APPLICATION AND CERTIFICATION FOR PAYMENT

USE W/AIA G703

TO:

PROJECT:

APPLICATION NO:

Distribution to:

- ☐ ACCOUNTING
- ☐ PROJ. MGR.
- ☐ PROJECT FILES
- ☐
- ☐

PERIOD TO:

FROM SUBCONTRACTOR:

PROJECT NO:

CONTRACT FOR:

CONTRACT DATE:

SUBCONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM		$	0.00
2. Net change by Change Orders		$	0.00
3. CONTRACT SUM TO DATE (Line 1 ± 2)		$	0.00
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)		$	0.00
5. RETAINAGE:			
a. 10% of Completed Work (Column D + E on G703)	$0.00		
b. 10% of Stored Material (Column F on G703)	$0.00		
Total Retainage (Lines 5a + 5b or Total in Column I of G703)			0.00
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)			$0.00
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)			
8. CURRENT PAYMENT DUE			$0.00
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)			$0.00

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner		
Total approved this Month		
TOTALS		
NET CHANGES by Change Order	$0.00	

SUBCONTRACTOR CERTIFICATION AND LIEN WAIVER

I herby certify that the work performed and the materials supplied to date, as shown herein, represent the actual value of completed work under the terms of the contract between the undersigned and **SouthCon Building Group** relating to the referenced project.

I also certify that all payments have been made through the period covered by previous payments received from the contractor, to all my subcontractors, and for all materials and labor used in connection with the performance of this contract. I further certify that I have complied with federal, state and local tax laws, including social security laws, unemployment tax laws, and workmens compensation laws insofar as applicable to the performance of this contract.

I certify that contingent upon release of said payment, the undersigned does hereby waive, release, remiss and relinquish any and all rights to claim any lien or liens for work done or material furnished, prior to the date thereof, for the building and premises referenced on said invoice.

SUBCONTRACTOR

By: _____ Date: _____

State of Alabama County: Macon
Subscribed and sworn to before me this _____ day of _____
Notary Public:
My Commission expires:

By: _____ Date: _____

APPLICATION APPROVAL BY PROJECT MANAGER

BY: _____ DATE: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Subcontractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of SouthCon Building Group under this Contract.

CONTINUATION SHEET *AIA DOCUMENT G703* PAGE 1 OF 1 PAGES

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing
Contractor's signed certification is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
			ROM PREVIOU APPLICATION (D + E)	THIS PERIOD					
						$0.00			
						$0.00			
						$0.00			
						$0.00			
						$0.00			
						$0.00			
						$0.00			
						$0.00			
						$0.00			
						$0.00			
						$0.00			
						$0.00			
		$0.00	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**#DIV/0!**	**$0.00**	**$0.00**

Change Order

PROJECT: (*Description and location*)

CHANGE ORDER NUMBER:

CHANGE ORDER DATE:

TO CONTRACTOR: (*Name and address*)

ORIGINAL CONTRACT DATE:

THE CONTRACT IS CHANGED AS FOLLOWS:
(Describe any scope changes, alterations, deletions or additions; attach justification and backup)

The original Contract Sum was	$_____
The net change by previously authorized Change Orders	$_____
The Contract Sum prior to this Change Order was	$_____
The Contract Sum will be increased/decreased by this Change Order in the amount of	$_____
The new Contract Sum including this Change Order will be	$_____

The Contract Time will be increased by _____ days.
The date of Substantial Completion with this Change Order is now _____.

ALL OTHER TERMS AND CONDITIONS OF THE CONTRACT REMAIN THE SAME.

THIS CHANGE ORDER IS NOT VALID UNTIL SIGNED BY THE CONTRACTOR AND AN AUTHORIZED REPRESENTATIVE OF THE OWNER.

_____	_____
CONTRACTOR (Firm name)	**OWNER**
_____	_____
ADDRESS	**ADDRESS**
_____	_____
BY (Signature)	**BY (Signature)**
_____	_____
(Typed name)	**(Typed name)**
_____	_____
DATE	**DATE**

SECTION 01 1000

SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Tuskegee University – Renovation of Commons E & G

B. Owner's Name: Board of Trustees for Tuskegee University Tuskegee, Alabama.

C. Architect's Spec Term: The Architect.

D. Architect's Name: Williams Blackstock Architects.

E. The Project consists of: Renovations to Commons Residence Buildings E & G on the Campus of Tuskegee University
   1 Interior Building Renovations include Interior demolition of existing damaged and ruined construction, fixtures, finishes and equipment. This Project will include repair of electrical and mechanical systems, removal and replacement of lighting, plumbing, HVAC and fire suppression system components and equipment.
   2 Exterior Renovations will include Roof Replacements, Masonry repair and refurbishment, window repairs and door replacements, gutter system removal and replacement, exterior rebuilding of damaged woodwork, an the general restoration of weather tightness for the buildings including painting and sealaing of exterior surfaces

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 6000 - Construction Agreement.

1.03 DESCRIPTION OF ALTERATIONS WORK

A. Scope of demolition and removal work is indicated on drawings and specified in Section 02 4250 - Selective Demolition .

B. Scope of alteration and reconfiguration work is shown on drawings.

C. Plumbing: Alter existing and add new construction.

D. HVAC: Alter existing and add new construction.

E. Electrical Power and Lighting: Alter existing and add new construction and equipment.

F. Fire Suppression Sprinklers: Alter existing and add new construction.

G. Fire Alarm: Upgrade and expand existing system.

H. Voice / Data: New system provided and installed by Owner except rough in by General Contractor as shown on drawings.

I. Security System: Security system upgrades by Owners security contractor.

1.04 OWNER OCCUPANCY

A. Owner intends to occupy the Project upon Substantial Completion.

B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

C. Schedule the Work to accommodate Owner occupancy.

1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

B. Arrange use of site and building to:
   1 Work by Others.
   2 Work by Owner.
   3 Prevent unauthorized tresspass, or access of site and premises by the public.

C. Provide access to and from site as required by law and by Owner:

D. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs while exit routes are altered, or inaccessible.

E. Utility Outages and Shutdown: To follow Owner's established Protocol precisely
   1 Prevent accidental disruption of utility services to other facilities.

F. Limit disruption of utility services to hours the building is unoccupied.

1.06 WORK SEQUENCE

A. Construct Work in one single phase during the construction period:

B. Coordinate construction schedule and operations with Owner.

C. Coordinate construction schedule and operations with Architect.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2000

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. Section 00 5200 - Agreement Form: Contract Sum, retainages, payment period, monetary values of unit prices.

B. Section 01 2100 - Allowances: Payment procedures relating to allowances.

C. Section 01 2200 - Unit Prices: Monetary values of unit prices; Payment and modification procedures relating to unit prices.

1.03 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

B. Forms filled out by hand will not be accepted.

C. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

D. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization.

E. Include in each line item, the amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.

F. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.

G. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. For each item, provide a column for listing each of the following:
   1 Item Number.
   2 Description of work.
   3 Scheduled Values.
   4 Previous Applications.
   5 Work in Place and Stored Materials under this Application.
   6 Authorized Change Orders.
   7 Total Completed and Stored to Date of Application.
   8 Percentage of Completion.
   9 Balance to Finish.
   10 Retainage.

E. Execute certification by signature of authorized officer.

F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

H. Submit one electronic and three hard-copies of each Application for Payment.

I. Include the following with the application:
   1 Transmittal letter as specified for submittals in Section 01 3000.
   2 Construction progress schedule, revised and current as specified in Section 01 3000.
   3 Partial release of liens from major subcontractors and vendors.
   4 Affidavits attesting to off-site stored products.

J. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 MODIFICATION PROCEDURES

A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to Contract Documents.

B. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.

C. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1 The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2 Promptly execute the change.

D. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within ____ days.
   1 If the Contractor fails to submit pricing information within the required timeframe the amount and any associated impact on the contract time shall be determined by the Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

E. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation. Document any requested substitutions in accordance with Section 01 6000.

F. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
   1 For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
   2 For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
   3 For pre-determined unit prices and quantities, the amount will based on the fixed unit prices.
   4 For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

G. Substantiation of Costs: Provide full information required for evaluation.
   1 On request, provide the following data:
      a. Quantities of products, labor, and equipment.
      b. Taxes, insurance, and bonds.
      c. Overhead and profit.
      d. Justification for any change in Contract Time.
      e. Credit for deletions from Contract, similarly documented.
   2 Support each claim for additional costs with additional information:

a. Origin and date of claim.
b. Dates and times work was performed, and by whom.
c. Time records and wage rates paid.
d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

3 For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

H. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

J. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

K. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

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

B. Application for Final Payment will not be considered until the following have been accomplished:
1 All closeout procedures specified in Section 01 7000.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2100

ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cash allowances.

B. Inspecting and testing allowances.

C. Payment and modification procedures relating to allowances.

1.02 RELATED REQUIREMENTS

A. Section 01 2000 - PRICE AND PAYMENT PROCEDURES: Additional payment and modification procedures.

B. Section 01 2200 - Unit Prices

1.03 LUMP SUM ALLOWANCES

A. Allowances shall include the cost to the Contractor of specific products and materials ordered by Owner or selected by Designer under the allowance and shall include insurance, freight, equipment rental and delivery to project site. Allowance shall not include material permanently affixed to structure.

B. Use the lump sum allowance only as directed by Designer for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

C. Contractor's overhead and profit for work or products executed under the allowance are to be included in the base or alternate bid and not in the allowance.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

E. Return unused materials purchased under the allowance to manufacturer or supplier for credit to owner. If requested, prepare unused material for attic stock storage by Owner when it is not economically practical to return the material for credit. Deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

F. Schedule: A "Lump Sum Allowances" is included at the end of this Section.

1.04 UNIT PRICE ALLOWANCES

A. Unit prices include all necessary material, cost of delivery, installation, insurance, overhead, profit and applicable taxes.

B. Unless otherwise indicated, Contractor's overhead and profit, labor, handling, installation, demolition, preparation, access and other cost associated with the unit price shall be included in unit price allowances.

C. Measurement and Payment: Where unit prices are for quantities that are more or less than what is provided for in the base contract, Contractor shall keep a record of amounts used as the work progresses. Such work shall be recorded daily on the as-built drawings or Owner approved log for verification. Contractor shall transmit unit quantity tracking information to Owner or Designer on a daily basis for verification. Designer or Owner shall verify the need for unit repairs prior to installation of repairs and track quantities. No contract adjustments will be made on any unit price quantities not verified by the Designer or Owner. In the event that a discrepancy exists between the contractor's counted quantities and the designer's counted quantities, the designer's quantities shall prevail.

D. Adjustments to final payments will be the quantity difference between the allowance and quantity applied times the unit price quoted in the bid.

E. Schedule: B "Unit Price Allowances" is included at the end of this Section.

F. Architect Responsibilities:

1 Consult with Contractor for consideration and selection of products, suppliers, and installers.

2 Select products in consultation with Owner and transmit decision to Contractor.

G. Contractor Responsibilities:

1 Assist Architect in selection of products, suppliers, and installers.

2 Obtain proposals from suppliers and installers and offer recommendations.

3 On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
4 Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
5 Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

H. Differences in costs will be adjusted by Change Order.

1.05 ALLOWANCES SCHEDULE (SEE DRAWINGS)

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2600

CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for handling and processing modifications to the Contract.

1.02 RELATED REQUIREMENTS

A. Document 00 6000 - Contract Agreement for Construction: Contract Sum, retainages, payment period, monetary values of unit prices.

B. Document 00 7205 - General Conditions 00 7210 Supplementary Conditions: Additional requirements for contract modifications.

C. Document 00 7210 - Supplementary Conditions: Percentage allowances for Contractor's overhead and profit.

D. Section 01 2100 - Allowances: Administrative procedures relating to allowances.

E. Section 01 2200 - Unit Prices: Administrative modification procedures relating to verification and accounting related to unit prices.

F. Section 012300 - Alternates: Alternates for Construction.

1.03 MODIFICATION PROCEDURES

A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to the Contract Documents.

1.04 MINOR CHANGES IN THE WORK

A. Architect will issue through Project Manager supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.05 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

B. Only a Change Order or a Construction Change Directive authorizes Contractor to proceed with a proposed change.
   1 Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
   2 Within time stipulated in Proposal Request after receipt of same, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
      a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
      b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      c. Include costs of labor and supervision directly attributable to the change.
      d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

C. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to the Architect.
   1 Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
   2 Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
   3 Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   4 Include costs of labor and supervision directly attributable to the change.

5 Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

6 Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

D. Proposal Request Form: Use form acceptable to Architect and Authority Having Jurisdiction

1.06 ADMINISTRATIVE CHANGE ORDERS

A. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1 Include installation costs in purchase amount only where indicated as part of the allowance.

2 If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.

3 Delete both subparagraphs below if no unit-cost allowances.

4 Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.

5 Subparagraph below reflects the major problem of unit-cost allowances. No matter who performs the Work, a final quantity survey is needed.

6 Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

7 Paragraph and subparagraphs below are expanded in AIA Document A201. If the Supplementary Conditions modify the provisions in AIA Document A201, coordinate requirements with the Supplementary Conditions.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's handling, labor, installation, overhead, and profit. Submit claims within 10 (Ten) working days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Owner will reject claims submitted later than 21 (Twenty One) days after such authorization.

C. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.

D. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.07 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Contractor, Architect and Owner on Document 00 6230 - Contract Change Order , Rev. 8 / 05.

1.08 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1 Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1 After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

C. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.

D. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1 The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2 Promptly execute the change.

E. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 14 days.

F. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 6000.

G. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
   1 For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
   2 For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
   3 For pre-determined unit prices and quantities, the amount will based on the fixed unit prices.
   4 For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

H. Substantiation of Costs: Provide full information required for evaluation.
   1 On request, provide following data:
      a. Quantities of products, labor, and equipment.
      b. Taxes, insurance, and bonds.
      c. Overhead and profit.
      d. Justification for any change in Contract Time.
      e. Credit for deletions from Contract, similarly documented.
   2 Support each claim for additional costs with additional information:
      a. Origin and date of claim.
      b. Dates and times work was performed, and by whom.
      c. Time records and wage rates paid.
      d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
   3 For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

I. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

J. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

K. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

L. Promptly enter changes in Project Record Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 3000

SUBMITTALS AND ADMINISTRATIVE REQUIREMENTS

PART ONE GENERAL

1.01 SECTION INCLUDES

A. Progress Schedule: Submit as requested by the Owner.

B. Schedule of Values: Submit on Tuskegee provided schedule of values template or AIA Document G703. Furnish additional breakdowns as requested by the Owner.
   1 Closeout Submittals: See Section 01700.

C. List of Subcontractors: Submit for approval.

D. Evidence of Insurance: Submit as Required by the Agreement.

1.02 SHOP DRAWINGS, SAMPLES AND MANUFACTURER'S DATA:

A. General: Submit for review as required in detail specifications, but only after affixing signature of approval thereof; otherwise material will be returned disapproved. Contractor's approval stamp must represent that the item(s) complies with specifications criteria, and has been checked and coordinated with all parts of the Work. Revise and resubmit until Architect's/Engineer's release is secured.
   1 Architect / Engineer 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/Engineer's review of shop drawings, etc. 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 all items in that section are released. One copy of each submittal bearing the final review stamp of Architect/Engineer shall be kept at the project office and shall be maintained in good condition. No submittal other than those stamped "Approval as Noted" shall be on the job for any purpose.

B. Samples: Where required, submit two of each item clearly labeled as to manufacturer, quality and job. The Architect/Engineer will retain one sample for comparison with bulk shipments, and 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 Contract price adjusted.

C. Samples for Color Selection: Unless the precise color and pattern is specified, wherever a choice exists, submit accurate color and all items well in advance of the need for the first selection (not later than 30 days after award). With very minor exceptions no color selections will be made until samples for all items requiring selection have been submitted.

D. Operation and Maintenance Manuals: Operation and Maintenance Manuals are to be submitted for review and approval during construction. They are to be consolidated for the entire project and submitted in the specified format once the shop drawings and product data submissions are complete but no later than 30 days prior to contract completion date.

END OF SECTION

SECTION 01 3200

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

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

1.02 SECTION INCLUDES

A. administrative and procedural requirements for documenting the progress of construction during performance of the Work, as follows:
   1 Submittals Schedule.
   2 Contractor's Construction Schedule.
   3 Daily construction reports.
   4 Field condition reports.
   5 Construction Photographs.

1.03 RELATED REQUIREMENTS

A. Division 01 Section "Payment Procedures" for submitting the Schedule of Values.

B. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.

C. Division 01 Section "Submittals" for submitting schedules and reports.

D. Division 01 Section "Quality Assurance, Control, and Documentation" for submitting a schedule of tests and inspections.

E. Division 01 Section "Project Closeout" for submitting "As-Built Drawings" and "Specification Mark-ups" at Project closeout.

F. General Conditions, Article 9

G. Section 01 2100 - Allowances

1.04 SUBMITTALS

A. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and Owner/Commissioning Authorities, and other information specified.

B. As Built Survey: Prior to mobilization General Contractor shall execute an engineered "As Built" survey documentiing site conditions existing at the time of departure of the Buldiing Package 1 Contractor

C. Contractor's Construction Schedule: Initial (baseline) schedule, of size required to display entire schedule for entire construction period.
   1 Submit to Architect and Awarding Authority 3 printed copies and 1 working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (preliminary, initial (baseline) or updated) and date on label.

D. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
   1 Scheduled date for first submittal.
   2 Specification Section number and title.
   3 Submittal category (action or informational).
   4 Name of subcontractor.
   5 Description of the Work covered.
   6 Scheduled date for Architect's final release or approval.

E. Daily Construction Reports: To be completed daily by contractor's project staff. Submit to Architect and Awarding Authority.

F. Field Condition Reports: Submit 2 copies of report to architect and 1 copy of report to UA PM at time of discovery of differing conditions.

G. Construction Photographs: To be reviewed at each project meeting and to be submitted in electronic format (CD, DVD) with close-out documents.

1.05 DEFINITIONS

A. Schedule - A list of all distinct construction activities logically linked together to show the contractor's planned sequence of work.
   1 Preliminary Schedule - Schedule showing the contractor's planned sequence of work for the first 90 days of the project. This schedule is to include mobilization activities and procurement activities.
   2 Initial Schedule - The first schedule showing the contractor's planned sequence of all project activities. This schedule will serve as the baseline to measure progress of the work.
   3 Schedule Update - An update of the initial schedule showing current progress of the project.

B. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

C. Critical Activity: An activity on the critical path that must start and finish on the planned early start and early finish times.

D. Predecessor Activity: An activity that is linked to, and precedes, another activity in the network.

E. Successor Activity: An activity that is linked to, and follows, another activity in the network.

F. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. These relationships, and the activity durations, are used to calculate when activities can be performed, the duration of the project, and the critical path of the project.
   1 Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
   2 Float: The measure of leeway in starting and completing an activity.

1.06 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request. Reference section 01 3200 - 3.1 - A.

B. Pre-scheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to the Contractor's Construction Schedule, including, but not limited to, the following:
   1 Review software limitations and content and format for reports.
   2 Verify availability of qualified personnel needed to develop and update schedule.
   3 Discuss constraints, including phasing, work stages, area separations, interim milestones, and partial Owner occupancy.
   4 Review delivery dates for Owner-furnished products.
   5 Review Allowances and time required for procurement and installation.
   6 Review schedule for work of Owner's separate contracts.
   7 Review time required for review of submittals and resubmittals.
   8 Review requirements for tests and inspections by independent testing and inspecting agencies.
   9 Review time required for completion and startup procedures.
   10 Review and finalize list of construction activities to be included in schedule.
   11 Review submittal requirements and procedures.
   12 Review procedures for updating schedule.

1.07 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1 Secure time commitments for performing critical elements of the Work from all parties involved, including but not limited to the owner and subcontractors to the contractor.
   a. Submission of a construction schedule that includes subcontractor activities will imply to the owner that the contractor has acceptance of the schedule from the subcontractor(s) affected.
2 Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.01 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Use AGC's "Construction Planning & Scheduling," 2nd edition as a reference for additional definitions not included herein.

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion to date of Final Completion.
   1 Contract completion date can be changed, at the Awarding Authority's discretion, by submission of a schedule that shows an early completion date, as allowed by the General Conditions to the Contract.

C. Activities: Activities should be broken down and organized by floor, by elevation, and by work area. Comply with the following:
   1 Activity Duration: Define activities so no activity is longer than fifteen (15) days, unless specifically allowed by Architect and Owner. An exception will be granted for procurement activities.
   2 Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
      a. Examples include, but are not limited to, structural components, limestone or pre-cast components, architectural trim, plumbing, heating/cooling/ventilation equipment, window systems, conveying equipment, specialty items, etc.
   3 Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittals" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
   4 Startup and Testing Time: Include not less than seven days for startup and testing.
   5 Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
   1 Phasing: Arrange list of activities on schedule by phase.
   2 Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
   3 Products Ordered in Advance: Include a separate activity for each product.
   4 Owner-Furnished Products: Include a separate activity for each product.
   5 Work Restrictions: Show the effect of the following items on the schedule:
      a. Coordination with existing construction.
      b. Limitations of continued occupancies.
      c. Uninterruptible services.
      d. Partial occupancy before Substantial Completion.
      e. Use of premises restrictions.
      f. Provisions for future construction.
      g. Seasonal variations.
      h. Environmental control.

E. Milestones: Include milestones and activities indicated in the Contract Documents in the schedule, including, but not limited to, the Notice to Proceed, review inspections by review agencies, Pre-Install Conferences, Building Dry-in, Temp-Perm Power, Conditioned Air, Certificate of Occupancy, Substantial Completion, and Final Completion.

F. Resource/Staffing: Should the contractor's progress fall materially behind the accepted initial schedule (30 days or more), the awarding authority can require the contractor to incorporate resource loading into the recovery schedule to

indicate required staffing levels for each activity. This resource loading will show aggregate manpower requirements on a daily or weekly basis.

G. Cost Correlation: Provide cost correlation values, indicating planned and actual costs. Show dollar volume of the Work performed within the dates used for preparation of payment requests.
   1 Refer to Division 01 Section "Payment Procedures" for cost reporting and payment procedures.

H. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule.

I. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules. See Article 9 of the General Conditions of the contract for further information.

2.02 CONTRACTORS CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized, cost and resource loaded, time-scaled CPM network analysis program.
   1 Submit schedule to the Architect and Awarding Authority in the time frame listed below.
      a. For projects with a contract value of less than $5,000,000 - Initial schedule within 10 days of Issuance of Letter of intent or Notice to Proceed.
      b. For projects with a contract value of $5,000,000 to $20,000,000 - Preliminary schedule within 10 days of Issuance of Letter of intent or Notice to Proceed, and Initial schedule within 30 days of Issuance of Letter of intent or Notice to Proceed.
      c. For projects with a contract value greater than $20,000,000 - Preliminary schedule within 15 days of Issuance of Letter of intent or Notice to Proceed, and Initial schedule within 45 days of Issuance of Letter of intent or Notice to Proceed.
   2 Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meetings and payment request dates.
   3 Use "one workday" as the unit of time. Include a list of non-working days and holidays incorporated into the schedule.
   4 Failure to include any work item required for the performance of this schedule shall not excuse the Contractor from completing all work within the applicable completion dates, regardless of Architect or Owner approval of the schedule.

B. CPM Schedule Preparation: Prepare a list of all activities required to complete the work. Determine the relationship of each activity to the other activities, and link the activities together to indicate the logical sequence of work.
   1 Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities.
      a. Preparation and processing of submittals.
      b. Mobilization and demobilization.
      c. Purchase of materials.
      d. Delivery.
      e. Fabrication.
      f. Utility Interruptions.
      g. Power outages or any utility shut downs must be given advance notice of 30 days and must be included in the CPM schedule.
      h. Installation.
      i. Architect and Owner Inspections.
      j. Work by Owner that may affect or be affected by Contractor's activities.
      k. Testing and commissioning.
   2 Critical Path Activities: Clearly identify critical path activities, including those for interim completion dates. Schedule start and completion dates shall be consistent with Contract milestone dates.
   3 Processing: Process data to produce output on a computer-drawn,time-scaled network. Revise data, reorganize activity sequences and reproduce as often as necessary to produce the CPM schedule so that the work is shown to be complete within the limitations of the Contract Time.

C. Initial Issue of Schedule :

1 Sort the initial submission of the network diagram "early start" date. Identify clearly all critical activities. Show the following information on the schedule:
   a. Description of the activity.
   b. Contractor or subcontractor and the Work or activity.
   c. Predecessors and Successors.
   d. Early and late start dates.
   e. Early and late finish dates.
   f. Activity duration in workdays.
   g. Total float for each activity.
   h. Average size of workforce.

D. Schedule Updating:
1 Concurrent with making revisions to schedule, prepare tabulated reports and narrative(s) showing the following:
   a. Identification of activities that have changed.
   b. Changes in early and late start dates.
   c. Changes in early and late finish dates.
   d. Changes in activity durations in workdays.
   e. Changes in the critical path.
   f. Changes in total float or slack time.
   g. Changes in cost-loading or resource-loading.
   h. Changes in the Contract Time.

2.03 REPORTS

A. Daily Construction Reports:
1 Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
   a. List of subcontractors at Project site.
   b. List of separate contractors at Project site.
   c. Approximate count of personnel at Project site.
   d. Personnel count is to be broken down by subcontractor.
   e. All equipment at project site.
   f. High and low temperatures and general weather conditions.
   g. Accidents involving injury or damage to equipment or work in place.
   h. Meetings and significant decisions.
   i. Unusual events.
   j. Inspections of the work.
   k. Stoppages, delays, shortages, and losses.
   l. Meter readings and similar recordings.
   m. Emergency procedures enacted.
   n. Orders and requests of authorities having jurisdiction.
   o. Change Orders received and implemented.
   p. Construction Change Directives received.
   q. Services connected and disconnected.
   r. Equipment or system tests and startups.
2 The University of Alabama intends to require the General Contractor's Daily Reporting to be done using a Call-in service administered by a third party provider. The daily reporting will be required by all Superintendents listed in the project's minimum general contractor staffing requirements.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information. Include a detailed description of the differing conditions andphotographs illustrating the existing conditions, together with recommendations for changing the Contract Documents.

C. Construction Photographs: Photographs to document pre-existing conditions and to regularly document construction progress.

PART 3 - EXECUTION

3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Scheduling Consultant: Engage a 3rd party scheduling consultant to provide planning, evaluation, and reporting using CPM scheduling.
   1 In-House Option: Awarding Authority may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
   2 Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.

B. Float: Float is a shared resource, available to both parties as needed. The Contractor shall not sequester shared float through such strategies as (a) extending activity duration estimates to consume available float, (b) using preferential logic, or (c) using extensive crew / resource sequencing, constraints, unnecessary milestones, leads or lags on logic ties, and hammock type activities. Since Float within the Construction Schedule is jointly owned, no time extensions will be granted nor delay damages paid until a delay occurs which extends the work beyond the contract completion date. Since float within the Construction Schedule is jointly owned,it is acknowledged that Trustees-caused delays on the project may be offset by Trustees-caused time savings (i.e., critical path submittals returned in less time than allowed by the contract, approval of substitution requests and credit changes which result in a savings of time to the Contractor, etc.). In such an event, the Contractor shall not be entitled to receive a time extension or delay damages until all Trustee-caused time savings are exceeded and the contract completion date is also exceeded.

C. Weather Delays: The schedule must account for average weather delays for the local area. Weather delays will be calculated as days lost for events in excess of the NOAA 30 year average for Tuscaloosa, AL (1971 - 2000). Weather delays will not be granted for rain events less than 0.1 inches. Weather delays will not be granted for activities that are not shown to be on the critical path of the schedule at the time of the event.

D. Contractor's Construction Schedule Updating: At two-week intervals, update schedule to reflect actual construction progress and activities. Issue printed and electronic versions of schedule one week before each regularly scheduled progress meeting.
   1 If Last Planner Scheduling method is chosen by the Contractor CPM Schedule updates shall be provided at 6 week intervals in lieu of 2 week required otherwise.
   2 Include a report and narrative with each updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
   3 As the Work progresses, indicate Actual Completion percentage for each activity.
   4 At the end of the project, submit the As-Built schedule with actual start and finish dates to the owner as a close-out requirement.

E. Distribution: Distribute copies of approved schedule to Architect, Awarding Authority, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
   1 Post copies in Project meeting rooms and temporary field offices.
   2 When revisions are made, distribute updated schedules to the same parties and post in the same locations. Awarding Authority to receive both paper and working electronic copy of each update.
   3 Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

F. Construction Schedule Software:. The following CPM software shall be utilized:
   1 For projects with a contract value of less than $5,000,000 - Microsoft Project, Primavera P6, or other comparable software product.
   2 For projects with a contract value greater than $5,000,000 - Primavera P6 or other comparable software product.

3.02 CONSTRUCTION PHOTOGRAPHS

A. Photographic Process: Digital Imaging.

B. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.

C. Preconstruction Digital Photographs and Digital Video Recording: Before starting construction, take color photographs and digital video recording of Project site and affected City right-of-ways and surrounding properties and interior existing photos of affected areas from different vantage points. Show existing conditions adjacent to property.

D. Periodic Construction Photographs: Periodic digital color photographs and digital files to be submitted with each pay request with the following views:
   1 Exterior views of all distinct elevations on a weekly basis. Photographs of each elevation are to be taken from the same location throughout the project.
   2 Interior views of all levels of major spaces on a monthly basis. Of particular interest is the process of structure, mechanical (ductwork, equipment, plumbing, and sprinkler systems), electrical, partitions and interior finishes.
   3 Roof: Views of all roof areas on a weekly basis during periods when work is occurring on or adjacent to the roof.
   4 Field Office Prints: Retain one set of prints of periodic photographs in field office at Project site, available at all times for reference. Identify photographs the same as for those submitted to Architect.

END OF SECTION

SECTION 01 4000

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. References and standards.

D. Testing and inspection agencies and services.

E. Control of installation.

F. Mock-ups.

G. Tolerances.

H. Manufacturers' field services.

I. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Document 00 0160 - General Conditions: Inspections and approvals required by public authorities.

B. Section 01 2100 - Allowances: Allowance for payment of testing services.

C. Section 01 3010 - Administrative Requirements: Submittal procedures.

D. Section 01 4216 - Definitions.

E. Section 01 4219 - Reference Standards.

F. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2014).

B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2017.

C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2019.

D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2019.

E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2020.

F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2015.

1.04 SUBMITTALS

A. See Section 01 3010 - Administrative Requirements, for submittal procedures.

B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

C. Test Reports: After each test/inspection, promptly submit three copies of report, one for Owner, one for Architect and one for Contractor.

1 Include:

a. Date issued.

b. Project title and number.

c. Name of inspector.

d. Date and time of sampling or inspection.

e. Identification of product and specifications section.

f. Location in the Project.
g. Type of test/inspection.
h. Date of test/inspection.
i. Results of test/inspection.
j. Compliance with Contract Documents.
k. When requested by Architect, provide interpretation of results.

2 Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
1 Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2 Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
1 Submit report in duplicate within 30 days of observation to Architect for information.
2 Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

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

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications:
1 Prior to start of Work, solicit, receive and submit for the Owner's review and concurrence, professional services proposals naming each agency name, address, and telephone number, point of contact and names of full time registered Engineer and responsible officer.
2 Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
3 Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

1.06 REFERENCES AND STANDARDS - SEE SECTION 01 4219

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.07 TESTING AND INSPECTION AGENCIES

A. Owner will employ and pay for services of an independent testing agency to perform other specified testing.

B. Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

C. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

D. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

E. Contractor Employed Agency:
   1 Testing agency: Comply with requirements of ASTM E 329, ASTM E 543, ASTM C 1021, ASTM C 1077, ASTM C 1093, and ASTM D3740.
   2 Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
   3 Laboratory Qualifications: Accredited by IAS according to IAS AC89.
   4 Laboratory: Authorized to operate in Alabama.
   5 Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
   6 Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

3.02 SAMPLE PANELS

A. For initial selection of items such as brick, Architectural precast concrete, mortar color, veneer stone, sealants, glazing, glazing framing and other items scheduled for incorporation into the comprehensive building envelope and other large scale mock-ups the contractor is required to provide adequate number of sample panels, or assemblies for that initial approval.

B. Smaller Mock-Ups and sample panels required by the individual Specification Sections shall stipulate either single or sample panels. If a required number is not clear Contractor shall request direction from the Architect. Likewise if a "range of variation" is described, such as with wood veneer, or brick the sample panel, or panels shall be produced to include the full range of variation inherent with the particular material.

3.03 MOCK-UPS

A. Before erecting, or installing any significant component of the Work, a full scale, comprehensive building envelope mock-up is required to be constructed at the project site, The Mock-Up is diagrammed and detailed on Dwg. Sheet A0.09 / 01 of the Construction Drawings, with the requirements and procedures for producing the Mock-Up are specified in Section 01 4310 - Qualty Assurance Mock-Up Requirements.
   1 Mock Up shall be constructed as outlined in the above referenced Section 01 4310 - Quality Assurance Mock-Up Requirements.

B. For each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-ups is to demonstrate the proposed range of aesthetic effects and workmanship.

C. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.
   1 Successful testing of mock-up components required is criteria for initial acceptance.

D. Curtainwall Sample Panel: For initial selection associated with choices for the comprehensive mock up, submit a minimum of 8 assembled samples of curtainwall components24 x 24 inches square as described and detailed on sheet A 0.09 in a single assembly 4 panels wide x 2 panels high illustrating finished aluminum surface, glazing infill panels, and glazing materials representing the available aluminum finishe in the specified color and the range of glass options matching the basis of design for the vision, spandrel and fritted insulating units.

E. Room Mock-Ups: Construct room Mock-Ups as indicated on Drawings. Coordinate installation of materials, products, and assemblies as required in Specification Sections and referenced herein; finish according to requirements. Provide required lighting and any supplemental lighting where required to enable Architect to evaluate quality of the mock-up.

F. Provide supervisory personnel who will oversee mock-up construction. Provide workers that will be employed during the construction at Project.

G. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.

H. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

I. Obtain Architect's final approval of mock-ups before starting work, fabrication, or construction.
   1 Architect will issue written comments within Ten (10) calendar days of initial review and each subsequent follow up review of each mock-up.
   2 Make corrections as necessary until Architect's final approval is issued.

J. Accepted mock-ups shall represent the minimum standard of Quality and Workmanship for the remaining Work.

K. Where a mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so by Architect.

L. Where possible salvage and recycle the demolished mock-up materials.

M. Other minor mockups and sample assemblies are required in individual specification sections. Review Mock-Up requirements and notify Architect of any discrepencies between Mock-Up construction and building construction.

N. Other required Mock ups include:
   1 See specific Individual mock up requirements for materials and assemblies as outlined in individual technical sections.

3.04 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.05 TESTING AND INSPECTION

A. See individual specification sections for testing and inspection required.

B. Testing Agency Duties:
   1 Test samples of mixes submitted by Contractor.
   2 Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   3 Perform specified sampling and testing of products in accordance with specified standards.
   4 Ascertain compliance of materials and mixes with requirements of Contract Documents.
   5 Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
   6 Perform additional tests and inspections required by Architect.

7 Attend preconstruction meetings and progress meetings.
8 Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:
1 Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2 Agency may not approve or accept any portion of the Work.
3 Agency may not assume any duties of Contractor.
4 Agency has no authority to stop the Work.

D. Contractor Responsibilities:
1 Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2 Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3 Provide incidental labor and facilities:
a. To provide access to Work to be tested/inspected.
b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
c. To facilitate tests/inspections.
d. To provide storage and curing of test samples.
4 Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5 Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6 Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

F. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.06 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, and start-up of equipment, as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect 30 days in advance of required observations.
1 Observer subject to approval of Architect.
2 Observer subject to approval of Owner.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.07 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 4216

DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY

A. This section supplements the definitions contained in the General Conditions.

B. Other definitions are included in individual specification sections.

1.02 DEFINITIONS

A. Furnish: To supply, deliver, unload, and inspect for damage.

B. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.

C. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.

D. Project Manual: The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.

E. Provide: To furnish and install.

F. Supply: Same as Furnish.

G. 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.

H. 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)

I. 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.

J. 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 . The Date of Substantial Completion is the date established in accordance with the General Conditions. 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.

K. 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.

L. Defective Work: The term "Defective Work" shall apply to: (1) any product, material, system, equipment, or service, or its installation or performance, which does not conform to the requirements of the Contract Documents, (2) in-progress or completed Work the workmanship of which does not conform to the quality specified or, if not specified, to the quality produced by skilled workers performing work of a similar nature on similar projects in the state, (3) substitutions and deviations not properly submitted and approved or otherwise authorized, (4) temporary supports, structures, or construction which will not produce the results required by the Contract Documents, and (5) materials or equipment rendered unsuitable for incorporation into the Work due to improper storage or protection.

M. 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.

N. Notice to Proceed (NTP): 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.

O. Owner: The Owner is the entity or entities identified as such in the Construction Contract and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's authorized representative. The term "Owner" as used herein shall be synonymous with the term "Awarding Authority" as defined and used in Title 39 - Public Works, Code of Alabama, 1975, as amended.

P. 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.

Q. 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.

R. 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.

S. 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.

T. 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.

U. The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

V. Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 4219

REFERENCE STANDARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements relating to referenced standards.

B. Reference standards full title and edition date.

1.02 RELATED REQUIREMENTS

A. Document 00 7200 - General Conditions: Reference standards.

1.03 QUALITY ASSURANCE

A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with the reference standard of date of issue specified in this section, except where a specific date is established by applicable code.

C. Obtain copies of standards when required by Contract Documents.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Date of Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect shall be altered by Contract Documents by mention or inference otherwise in any reference document.

PART 2 CONSTRUCTION INDUSTRY ORGANIZATION DOCUMENTS

2.01 AA -- ALUMINUM ASSOCIATION, INC.

A. AA DAF-45 - Designation System for Aluminum Finishes; 2003 (Reaffirmed 2009).

2.02 AAMA -- AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION

A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2017.

B. AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure; 2017.

C. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2015.

D. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2014 (2015 Errata).

E. AAMA 612 - Voluntary Specification, Performance Requirements, and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum; 2017a.

F. AAMA 701/702 - Combined Voluntary Specifications for Pile Weatherstrip and Replaceable Fenestration Weatherseals; 2011.

G. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

H. AAMA 1801 - Voluntary Specification for the Acoustical Rating of Exterior Windows, Doors, Skylights and Glazed Wall Sections; 2013.

I. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

J. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

K. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

L. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.

2.03 AASHTO -- AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS

A. AASHTO M 36 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains; 2016.

B. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses; 2017.

C. AASHTO M 180 - Standard Specification for Corrugated Sheet Steel Beams for Highway Guardrail; 2018.

D. AASHTO M 216 - Standard Specification for Lime for Soil Stabilization; 2013 (Reapproved 2017).

E. AASHTO M 288 - Standard Specification for Geosynthetic Specification for Highway Applications; 2017.

F. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18 in.) Drop; 2018.

G. AASHTO T 205 - Standard Specification for Density of Soil In-Place by the Rubber-Balloon Method; 1986 (Reapproved 1996).

H. AASHTO T 238 - Standard Specification for Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth); 1997.

I. AASHTO T 239 - Standard Specification for Moisture Content of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth); 1997.

2.04 AATCC -- AMERICAN ASSOCIATION OF TEXTILE CHEMISTS & COLORISTS

A. AATCC Test Method 16 - Colorfastness to Light; 2004, with Editorial Revision (2010).

B. AATCC Test Method 30 - Antifungal Activity, Assessment on Textile Materials: Mildew and Rot Resistance of Textile Materials; 2017.

2.05 ACI -- AMERICAN CONCRETE INSTITUTE INTERNATIONAL

A. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).

B. ACI 201.2R - Guide to Durable Concrete; 2016.

C. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).

D. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete; 1998 (Reapproved 2004).

E. ACI 301 - Specifications for Structural Concrete; 2016.

F. ACI 302.1R - Guide to Concrete Floor and Slab Construction; 2015.

G. ACI 303R - Guide to Cast-in-Place Architectural Concrete Practice; 2012.

H. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete;.

I. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).

J. ACI 305R - Guide to Hot Weather Concreting; 2010.

K. ACI 306R - Guide to Cold Weather Concreting; 2016.

L. ACI 308R - Guide to External Curing of Concrete; 2016.

M. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2018).

N. ACI 347 - Recommended Practice For Concrete Formwork;.

O. ACI 347R - Guide to Formwork for Concrete; 2014, with Errata (2017).

P. ACI 530.1/ASCE 6/TMS 602 - Specification for Masonry Structures; 2008.

Q. ACI SP-66 - ACI Detailing Manual; 2004.

2.06 ADC -- AIR DIFFUSION COUNCIL

A. ADC 1062: GRD - Test Code for Grilles, Registers & Diffusers; 1984.

2.07 AFPA -- AMERICAN FOREST AND PAPER ASSOCIATION

A. AFPA (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; 2012.

2.08 AGA -- AMERICAN GALVANIZERS ASSOCIATION, INC.

A. AGA-89 - Hot Dip Galvanizing for Corrosion Protection of Steel Products; 1989.

2.09 AGC -- ASSOCIATED GENERAL CONTRACTORS OF AMERICA

A. AGC (CPSM) - Construction Planning and Scheduling Manual; 2004.

2.10 AHA -- AMERICAN HARDBOARD ASSOCIATION

A. AHA (INST) - Application Instructions for Basic Hardboard Products; 2002.

B. AHA A135.4 - Basic Hardboard; 2004.

C. AHA A135.6 - Hardboard Siding; 1998.

2.11 AI -- THE ASPHALT INSTITUTE

A. AI SS-1 - Model Construction Specifications for Asphalt Concrete and Other Plant-Mix Types; Seventh Edition (reprinted 1992).

B. AI SS-2 - Specifications for Paving and Industrial Asphalts; 1995.

C. AI CL-2 - Model Specifications for Small Paving Jobs; 1989.

D. AI ES-1 - Asphalt Technology and Construction Practices: Instructors Guide; 1983.

E. AI MS-2 - Asphalt Mix Design Methods; 2015.

F. AI MS-20 - Asphalt Hot Mix Recycling; Second Edition.

2.12 AISC -- AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC.

A. AISC (AMAN) - ASD Manual of Steel Construction; 1989, Ninth Edition.

B. AISC (LMAN) - LRFD Manual of Steel Construction, Volume I - Structural Members, Specifications and Codes; 2001, Third Edition.

2.13 AISI -- AMERICAN IRON AND STEEL INSTITUTE

A. AISI RG-9518 - Design Guide for Cold-Formed Steel Trusses; American Iron and Steel Institute; December 1995.

B. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2018).

C. AISI SG-971 - Specification for the Design of Cold-Formed Steel Structural Members; 1996, with 2000 Supplement.

D. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement.

E. AISI SG-973 - Cold-Formed Steel Design Manual; 1996.

2.14 AITC -- AMERICAN INSTITUTE OF TIMBER CONSTRUCTION

A. AITC 108 - Standard For Heavy Timber Construction; 1993.

B. AITC 109 - Standard for Preservative Treatment of Structural Glued Laminated Timber; 2007.

C. AITC 110 - Standard Appearance Grades for Structural Glued Laminated Timber; 2001.

D. AITC 111 - Recommended Practice for Protection of Structural Glued Laminated Timber During Transit, Storage and Erection; 2005.

E. AITC 112 - Standard for Tongue-and-Groove Heavy Timber Roof Decking; 1993, with Errata (2003).

F. AITC 113 - Standard for Dimensions of Structural Glued Laminated Timber; 2010.

G. AITC 117 - Standard Specifications for Structural Glued Laminated Timber of Softwood Species; 2010.

H. AITC A190.1 - American National Standard for Wood Products - Structural Glued Laminated Timber; 2007.

2.15 ALSC -- AMERICAN LUMBER STANDARDS COMMITTEE

2.16 ANSI -- AMERICAN NATIONAL STANDARDS INSTITUTE

A. ANSI A13.1 - Scheme for the Identification of Piping Systems; 1981 (R1993).

B. ANSI A21.11 - American National Standard for Rubber Gasket Joints For Cast Iron and Ductile Iron Pressure Pipe and Fittings; current edition.

C. ANSI A108.1 - American National Standard for Installation of Ceramic Tile; 2011.

D. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2017.

E. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2017.

F. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement; 1999 (Reaffirmed 2016).

G. ANSI A108.3 - Quarry Tile and Paver Tile Installed With Portland Cement Mortar; 2013.1.

H. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).

I. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

J. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2018.

K. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2016).

L. ANSI A135.4 - American National Standard for Basic Hardboard; 2012.

2.17 ASCE -- AMERICAN SOCIETY OF CIVIL ENGINEERS

2.18 ASTM A SERIES -- ASTM INTERNATIONAL

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished; 2018.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

E. ASTM A185/A185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.

F. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2019.

G. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2017.

H. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2020.

I. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019.

J. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2016.

K. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars; 2017.

L. ASTM A786/A786M - Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates; 2015.

M. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement; 2014.

N. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.

O. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2018a.

2.19 ASTM B SERIES -- ASTM INTERNATIONAL

A. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).

B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

C. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.

D. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction; 2012 (Reapproved 2019).

2.20 ASTM C SERIES -- ASTM INTERNATIONAL

A. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2018.

B. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2020.

C. ASTM C91/C91M - Standard Specification for Masonry Cement; 2018.

D. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2020.

E. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units; 2020.

F. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2015a.

G. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.

H. ASTM C150/C150M - Standard Specification for Portland Cement; 2020.

I. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2016.

J. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2016.

K. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.

L. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2012, with Editorial Revision (2019).

M. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).

N. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019.

O. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.

P. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2017a.

Q. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2018.

R. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2017.

S. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017.

T. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019.

U. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board; 2004 (Reapproved 2020).

V. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2019.

W. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2019.

X. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2017.

Y. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.

Z. ASTM C642 - Standard Test Method for Density, Absorption, and Voids in Hardened Concrete; 2013.

AA. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2018.

AB. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015.

AC. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.

AD. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2017.

AE. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

AF. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2018.

AG. ASTM C834 - Standard Specification for Latex Sealants; 2017.

AH. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2019b.

AI. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2018.

AJ. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

AK. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2018.

AL. ASTM C955 - Standard Specification for Cold-Formed Steel Structural Framing Members; 2018, with Editorial Revision.

AM. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.

AN. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2014).

AO. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2019.

AP. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2013.

AQ. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2017.

AR. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2016.

AS. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2019.

AT. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2017.

AU. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.

AV. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

AW. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2020.

AX. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2018.

AY. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2017.

AZ. ASTM C1288 - Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets; 2017.

BA. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2014.

BB. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2019.

BC. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2018.

BD. ASTM C1355/C1355M - Standard Specification for Glass Fiber Reinforced Gypsum Composites; 1996 (Reapproved 2015).

BE. ASTM C1364 - Standard Specification for Architectural Cast Stone; 2019.

BF. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

BG. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2019 (Reapproved 2020).

BH. ASTM C1634 - Standard Specification for Concrete Facing Brick; 2017.

2.21 ASTM D SERIES -- ASTM INTERNATIONAL

A. ASTM D225 - Standard Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules; 2007.

B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016.

C. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2012, with Editorial Revision (2015).

D. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2017).

E. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type); 2011 (Reapproved 2016).

F. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2007.

G. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 2012, with Editorial Revision (2015).

H. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2018.

I. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2019.

J. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2015.

K. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015, with Editorial Revision (2017).

L. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2017).

M. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.

N. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2019.

O. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser; 2019.

P. ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free; 2007 (Reapproved 2018).

Q. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2018).

R. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015.

S. ASTM D4869/D4869M - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing; 2016a.

T. ASTM D6380/D6380M - Standard Specification for Asphalt Roll Roofing (Organic Felt); 2003 (Reapproved 2018).

U. ASTM D6866 - Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis; 2020.

2.22 ASTM E SERIES -- ASTM INTERNATIONAL

A. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

B. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2020a.

C. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments; 2019.

D. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2020.

E. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

F. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2016).

G. ASTM E413 - Classification for Rating Sound Insulation; 2016.

H. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2015.

I. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference; 2000 (Reapproved 2016).

J. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2020.

K. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015.

L. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 2014.

M. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2019.

N. ASTM E1408 - Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems; 1991 (Reapproved 2000).

O. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017.

2.23 AWC -- AMERICAN WOOD COUNCIL

A. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; 2015.

2.24 AWI -- ARCHITECTURAL WOODWORK INSTITUTE

2.25 AWI/AWMAC/WI -- JOINT PUBLICATION OF ARCHITECTURAL WOODWORK INSTITUTE/ARCHITECTURAL WOODWORK MANUFACTURERS ASSOCIATION OF CANADA/WOODWORK INSTITUTE

2.26 AWMAC/WI -- JOINT PUBLICATION OF ARCHITECTURAL WOODWORK MANUFACTURERS ASSOCIATION OF CANADA/WOODWORK INSTITUTE

2.27 AWPA -- AMERICAN WOOD-PRESERVERS' ASSOCIATION

A. AWPA U1 - Use Category System: User Specification for Treated Wood; 2018.

2.28 AWS -- AMERICAN WELDING SOCIETY

A. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

B. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

2.29 BHMA -- BUILDERS HARDWARE MANUFACTURERS ASSOCIATION

A. BHMA A156.9 - American National Standard for Cabinet Hardware; 2015.

2.30 FM -- FACTORY MUTUAL GLOBAL

2.31 GA -- GYPSUM ASSOCIATION

A. GA-216 - Application and Finishing of Gypsum Panel Products; 2016.

B. GA-224 - Installation of Predecorated Gypsum Board; Gypsum Association; 2008.

C. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2016.

D. GA-600 - Fire Resistance Design Manual; 2015.

2.32 HPVA -- HARDWOOD PLYWOOD VENEER ASSOCIATION

A. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2016.

2.33 ICC -- INTERNATIONAL CODE COUNCIL, INC.

2.34 ICC-ES -- ICC EVALUATION SERVICE, INC.

A. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers; 2016.

2.35 ITS -- INTERTEK TESTING SERVICES NA, INC.

2.36 MPI -- MASTER PAINTERS INSTITUTE (MASTER PAINTERS AND DECORATORS ASSOCIATION)

A. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.

B. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

2.37 NAAMM -- THE NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS

A. NAAMM MBG 531 - Metal Bar Grating Manual; 2017.

B. NAAMM MBG 532 - Heavy Duty Metal Bar Grating Manual; 2009.

2.38 NEMA -- NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

A. NEMA MG 1 - Motors and Generators; 2018.

2.39 NFPA -- NATIONAL FIRE PROTECTION ASSOCIATION

A. NFPA 10 - Standard for Portable Fire Extinguishers; 2017, with Errata (2018).

B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2019.

D. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2019.

E. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2017.

2.40 NHLA -- NATIONAL HARDWOOD LUMBER ASSOCIATION

A. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; 2015.

2.41 NRCA -- NATIONAL ROOFING CONTRACTORS ASSOCIATION

A. NRCA (RM) - The NRCA Roofing Manual; 2019.

2.42 NSF -- NSF INTERNATIONAL (THE PUBLIC HEALTH AND SAFETY ORGANIZATION)

A. NSF 61 - Drinking Water System Components - Health Effects; 2019.

2.43 NWWDA -- NATIONAL WOOD WINDOW AND DOOR ASSOCIATION (NAME CHANGED TO WDMA)

2.44 SCAQMD -- SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

A. SCAQMD 1168 - Adhesive and Sealant Applications; 1989 (Amended 2017).

2.45 SJI -- STEEL JOIST INSTITUTE

A. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders; 2008.

2.46 SMACNA -- SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC.

A. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

2.47 SPIB -- SOUTHERN PINE INSPECTION BUREAU, INC.

A. SPIB (GR) - Grading Rules; 2014.

2.48 SSPC -- SOCIETY FOR PROTECTIVE COATINGS

A. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

B. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

C. SSPC-SP 2 - Hand Tool Cleaning; 2018.

2.49 SWRI -- SEALANT, WATERPROOFING AND RESTORATION INSTITUTE

A. SWRI (VAL) - SWR Institute Validated Products Directory; Current Edition.

2.50 TMS -- THE MASONRY SOCIETY

A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2016.

2.51 UL -- UNDERWRITERS LABORATORIES INC.

A. UL (FRD) - Fire Resistance Directory; Current Edition.

B. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

C. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

D. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; current edition, including all revisions.

E. UL 181A - Closure Systems for Use with Rigid Air Ducts; Current Edition, Including All Revisions.

F. UL 207 - Standard for Refrigerant-Containing Components and Accessories, Nonelectrical; Current Edition, Including All Revisions.

G. UL 444 - Communications Cables; Current Edition, Including All Revisions.

H. UL 465 - Central Cooling Air Conditioners; Current Edition, Including All Revisions.

I. UL 497 - Standard for Protectors for Paired-Conductor Communications Circuits; Current Edition, Including All Revisions.

J. UL 514C - Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers; Current Edition, Including All Revisions.

K. UL 555 - Standard for Fire Dampers; Current Edition, Including All Revisions.

L. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies; Current Edition, Including All Revisions.

M. UL 705 - Power Ventilators; Current Edition, Including All Revisions.

N. UL 790 - Standard for Standard Test Methods for Fire Tests of Roof Coverings; Current Edition, Including All Revisions.

O. UL 834 - Heating, Water Supply, and Power Boilers - Electric; Current Edition, Including All Revisions.

P. UL 900 - Standard for Air Filter Units; Current Edition, Including All Revisions.

Q. UL 935 - Fluorescent-Lamp Ballasts; Current Edition, Including All Revisions.

R. UL 1096 - Electric Central Air Heating Equipment; Current Edition, Including All Revisions.

S. UL 1581 - Reference Standard for Electrical Wires, Cables, and Flexible Cords; Current Edition, Including All Revisions.

T. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

U. UL 1863 - Communications-Circuit Accessories; Current Edition, Including All Revisions.

V. UL 1995 - Heating and Cooling Equipment; Current Edition, Including All Revisions.

2.52 WCLIB -- WEST COAST LUMBER INSPECTION BUREAU

2.53 WDMA -- WINDOW AND DOOR MANUFACTURERS ASSOCIATION (FORMERLY NWWDA)

A. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2013.

B. NWWDA I.S.1.6 - Testing and Inspection Requirements for Wood Flush Doors; 1987.

C. NWWDA I.S.2 - Wood Windows; 1993.

D. WDMA I.S. 4 - Industry Specification for Preservative Treatment for Millwork; 2015a.

E. WDMA I.S.6 - Wood Stile and Rail Doors; 1997.

F. WDMA I.S. 6A - Interior Architectural Wood Stile and Rail Doors; 2013.

2.54 WRCLA -- WESTERN RED CEDAR LUMBER ASSOCIATION

2.55 WWPA -- WESTERN WOOD PRODUCTS ASSOCIATION

END OF SECTION

SECTION 01 5010

TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 SAFETY PRECAUTIONS

A. Provide and assume complete responsibility for such safety program and facilities as will adequately protect workmen, the public and others who may properly be about this site. In compliance with OSHA requirements, the Contractor shall conduct weekly safety meetings and submit to University's Construction Administration.

1.02 UTILITIES

A. Electrical Service:
   1 Unless otherwise indicated in the construction documents, the Owner shall make available utility service to the construction area from the Owner's distribution system. Contractor shall be responsible for all cost incurred for extension of the utility service to the site/project. Contractor shall provide and install all service entrance equipment including service poles, conductors, meter base and disconnect.
      a. When electrical service to the site is provided by the University of Alabama distribution system, the contractor shall not include the cost for electricity during construction. The Contractor shall follow the Construction Project Energy and Utility Management Plan outlined below in Paragraph 6 for the project. The plan will be implemented by the Contractor at all times while work is taking place.
      b. When electrical service to the site is provided by Alabama Power Company distribution system, then the Contractor shall 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 Project site. Contractor shall be responsible for all monthly utility costs for duration of project or date of substantial completion.

B. Water Service:
   1 Unless otherwise indicated in the construction documents, the Contractor shall contract with the City of Tuscaloosa to provide Service.
      a. It is the responsibility of the Contractor to reconcile and transfer this service to the University at the Date of Substantial Completion.
      b. The contractor is required to have any temporary metering removed at the end of the project. Any usage cost of the temporary service is the contractor's responsibility.

1.03 EQUIPMENT

A. HVAC Equipment:
   1 None of the installed, permanent, heating, ventilation, and air conditioning equipment shall be operated prior to the HVAC Pre installation Conference.
   2 The Contractor may schedule this meeting only after the doors and exterior windows or suitable, weathertight temporary construction is in place,approved by the University and the area is relatively dust free. At a minimum, the floors shall be broom clean, drywall finishing, paint spraying and any "wet " work shall have been completed.

B. Prior to Equipment start up,minimum MERV 8 filters shall be installed on all returns and outside air serving the air handling units. It is the responsibility of the contractor to periodically change filters and clean coils as required until the Date of Substantial Completion.

C. Permanent Electrical Service: A permanent meter must be installed and functioning properly prior to energizing any new utility service. University of Alabama Energy Management must be present at the start-up of this service to verify the meter is reading zero and functioning properly. If the meter is found to not function properly, the utility service will be terminated until such time that the meter is repaired and reset. If the Utility Company provides the meter and service, it is the responsibility of the Contractor to reconcile and transfer this service to the University at time of substantial completion.

PART 2 - PRODUCTS

2.01 UA CONSTRUCTION PROJECT ENERGY AND UTILITY MANAGEMENT PLAN

A. This energy management plan is to be implemented at the initiation of the project, and is to be maintained for the full duration of the project.

B. The general contractor and all sub-contractors shall be conscientious of the fact that The University of Alabama is paying for certain utility costs during construction.

C. All sub-contractors are required to adhere to the general contractor's energy conservation plan. The contractor is required to adequately communicate the energy conservation plan to all of the Trade contractors' and Sub-contractors' employees working at the job site to ensure compliance.

2.02 TEMPORARY CONSTRUCTION POWER

A. All temporary / permanent construction power will have an appropriate electric meter installed prior to energizing power to the construction site.

B. Contractors are to limit their consumption of construction power to only activities required to complete their contract work.

C. Energy management shall any all jobsite trailers, or other temporary structures on site which which will be using light, power, water and HVAC. To minimize energy usage, the lighting is to be used only while trailers are occupied and the use of Occupancy Sensors ir encouraged. HVAC thermostat is to be set at a moderate temperature when occupied, and at an energy savings level when unoccupied.

2.03 TEMPORARY LIGHTING

A. All temporary construction lighting is to be energized at the beginning of the workday and de-energized at the end of the workday. Turning the lights out at the end of the day is to be an assigned responsibility.

B. Temporary lighting is to be provided to meet work, safety, and security requirements. Lighting should be installed to meet the needs of the work being installed and at the levels specified.

C. Temporary lighting used for security must be installed so that only a small percentage of the total lighting is to remain energized after hours.

D. The contractor is to review all lighting periodically, and repair or maintain as required. This includes replacing any burned out bulbs.

2.04 HVAC SYSTEMS

A. For buildings being tied into the UA central energy plant thermal water system, appropriate BTU meters are to be installed in the building thermal water piping prior to the use of chilled / hot water from the central energy plant.

B. No HVAC equipment shall be started or operated prior to the Pre-HVAC conference, which is to include the General Contractor, the HVAC subcontractor, the architect, the mechanical engineer, UA Energy Management and UA Construction Administration.

C. Thermal water piping systems will be flushed and cleaned prior to the start-up of any HVAC equipment along with the completed installation of any specified water treatment systems.

1 Flushing / cleaning / treatment requirements are to be addressed in detail in the HVAC Pre installation Conference.

D. Prior to start-up of heating and cooling equipment inside the building, doors and window are to be closed by some method. If the permanent windows and doors are not already installed, then temporary panels of plywood, plastic, etc. must be installed.

E. Systems for temporary air in the building are to be set at a level to conserve energy while providing necessary conditioning to meet the requirements of submittal data and contract documents. Settings should be determined based on what is needed to install the various paints, adhesives, woodwork, and other finishes per the manufactures recommendations (typically between 50 - 65 degrees during winter months, and between 75 - 85 degrees during summer months). The temperature should not set at 70 - 72 degrees just for personal comfort of those working inside the building.

F. The contractor will submit the requirements for the actual temperatures that will be maintained inside the building, and what methods will be used to ensure the temperature is maintained at these set-points.

G. Systems are to be protected with filter media on all return grilles and speed drives (VFDs) to provide the proper level of dust and contaminant protection required by the construction documents. The areas around HVAC return air intakes must be kept clean and the appropriate MERV 8 filter media must be used in all AHUs and associated speed drives (VFDs). The HVAC units should be turned off during any work that creates significant dust or other contaminants that can enter into the HVAC system.

H. The contractor is responsible for daily maintenance of the required filtering and protection. Maintenance is to be done by an HVAC contractor properly trained for this activity.

2.05 DOMESTIC WATER MANAGEMENT

A. All temporary construction water is to be used only when needed, and all valves are to be turned off at the end of each workday.

B. Water is not to be left running unattended for any reason.

C. Water usage in the building is to be for final cleaning and testing purposes. No sinks, urinals, or toilets in the building shall be permitted for use by any construction personnel at any time.

2.06 NATURAL GAS MANAGEMENT

A. The construction site will have an appropriate natural gas meter installed prior to any natural gas usage.

B. Gas will used only for testing purposes as per the construction documents unless needed for climate control.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 6000

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Sustainable design-related product requirements.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations and procedures.

F. Procedures for Owner-supplied products.

G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Lists of products to be removed from existing building.

B. Section 01 2500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.

C. Section 01 3010 - Administrative Requirements

D. Section 01 4000 - Quality Requirements: Product quality monitoring.

E. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

F. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

G. Section 22 0513 - Common Motor Requirements for Plumbing Equipment: Motors for plumbing equipment.

1.03 REFERENCE STANDARDS

A. 16 CFR 260.13 - Guides for the Use of Environmental Marketing Claims; Federal Trade Commission; Recycled Content; Current Edition.

B. ASTM D6866 - Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis; 2020.

C. NEMA MG 1 - Motors and Generators; 2018.

D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. When the following are specified in individual sections, submit them for review:
   1 Product data.
   2 Shop drawings.
   3 Samples for selection.
   4 Samples for verification.

B. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1 Submit within 15 days after date of Notice to Proceed.
   2 For products specified only by reference standards, list applicable reference standards.

C. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

D. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1 For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.

B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by Contract Documents.

B. Use of products having any of the following characteristics is not permitted:
   1 Made using or containing CFC's or HCFC's.

C. Where other criteria are met, Contractor shall give preference to products that:
   1 If used on interior, have lower emissions, as defined in Section 01 6116.
   2 If wet-applied, have lower VOC content, as defined in Section 01 6116.
   3 Are extracted, harvested, and/or manufactured closer to the location of the project.
   4 Have longer documented life span under normal use.
   5 Result in less construction waste. See Section 01 7419

D. Joint Sealants, Including Duct Sealers:
   1 Provide only products having lower volatile organic compound (VOC) content than required by Bay Area Air Quality Management District Regulation 8, Rule No.51.
      a. Require each installer to certify compliance and submit product data showing product content.
   2 Specific Product Categories: Comply with limitations specified elsewhere.

E. Provide interchangeable components of the same manufacture for components being replaced.

F. Motors: Refer to Section 22 0513 - Common Motor Requirements for Plumbing Equipment, NEMA MG 1 Type. Specific motor type is specified in individual specification sections.

G. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.

H. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. See Section 01 2500 - Substitution Procedures.

B. The Instructions to Bidders and Supplemental General Conditions of the Contract specify the time restrictions for submitting requests for substitutions during the bidding period: no later that 10 working days prior to the date of the Bid Opening. Comply with requirements specified in these sections.

C. All substitution requests shall be submitted through a General Contractor pre-qualified to bid on this project.

D. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.

E. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

F. A request for substitution constitutes a representation that the submitter:
   1 Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2 Will provide the same warranty for the substitution as for the specified product.
   3 Waives claims for additional costs or time extension that may subsequently become apparent.

3.02 OWNER-SUPPLIED PRODUCTS

A. Owner's Responsibilities:
   1 Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
   2 Arrange and pay for product delivery to site.
   3 On delivery, inspect products jointly with Contractor.
   4 Submit claims for transportation damage and replace damaged, defective, or deficient items.
   5 Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:
   1 Review Owner reviewed shop drawings, product data, and samples.
   2 Receive and unload products at site; inspect for completeness or damage jointly with Owner.
   3 Handle, store, install and finish products.
   4 Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 7419.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Provide off-site storage and protection when site does not permit on-site storage or protection.

G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

H. Comply with manufacturer's warranty conditions, if any.

I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

J. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

K. Prevent contact with material that may cause corrosion, discoloration, or staining.

L. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

M. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 6010

MATERIALS

PART 1 - GENERAL

1.01 REQUIREMENTS

A. Material shall be new and without any indication of damage or overage. If usually packaged bring to job in original unbroken labeled containers. Materials not specified but required, shall be of a grade equal or superior to related parts of work.

B. Brand Names: Mentioned herein to establish a standard of design and quality. Except when indicated in subsequent sections in regard to each particular item. Qualified pre-bid approval may be given to various vendors at their request on products for various vendors at their request on products for which pre-bid approval is not required; such approvals will be communicated only to the vendor.

1 Where three or more manufacturers are listed, the product must be furnished by one of the manufacturers so listed unless specific approval of other brand is obtained in writing. Comparison of substitute brands will be with the first name of those listed.

2 By requesting approval of a proposed 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 / Engineer, at its discretion shall require such certification in writing.

C. Installation: Install, apply, connect, clean and operate all materials and equipment per manufacturer's directions and recommendations. In event of conflict between specifications and manufacturer's directions, obtain instructions from Engineer.

D. Color Selections: The Architect's/Engineer's color schedule will be prepared 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.

E. Foreign Materials: In accordance with State Law, provide only materials manufactured, mined or processed in the United States or its territories, provided same are available at reasonable prices.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 7000

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.

C. Mockups.

D. Cutting and patching.

E. Surveying for laying out the work.

F. Temporary Environmental Conditions During Construction.

G. Minimum "Dry-In" Conditions.

H. In-Wall and Above-Ceiling Reviews.

I. Punchlist Review Scheduling.

J. Equipment Installation (by others).

K. Owner-Furnished/Contractor-Installed Products.

L. Cleaning and protection.

M. Starting of systems and equipment.

N. Demonstration and instruction for Owner personnel.

O. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 01 3100 - Submittals: Submittals procedures and formats.

B. Section 01 4000 - Quality Requirements: Testing and inspection procedures.

C. Section 01 5000 - Temporary Facilities: Temporary enclosures and utilities.

D. Section 01 5020 - Temporary Controls: Interior climate control prior to Systems Start Up. .

E. Section 01 7010 - Project Closeout: Project record documents, operation and maintenance data, warranties and bonds.

F. Section 01 7419 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.

G. Section 01 7610 - Temporary Protective Coverings: Materials for protection of installed work.

H. Section 01 7010 - Project Closeout: Project record documents, operation and maintenance data, warranties and bonds.

I. Section 01 7900 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections

J. Section 01 9113 - General Commissioning Requirements: Contractor's responsibilities in regard to commissioning.

K. Section 02 4200 - Demolition and Hazardous Material Removal: Demolition of whole structures and parts thereof; site utility demolition.

L. Section 07 8400 - Firestopping.

M. Individual Product Specification Sections:
   1 Advance notification to other sections of openings required in work of those sections.
   2 Limitations on cutting structural members.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2019.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1 On request, submit documentation verifying accuracy of survey work.
   2 Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
   3 Submit surveys and survey logs for the project record.

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

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 QUALIFICATIONS

A. For surveying work, employ a land surveyor registered in Alabama and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in Alabama. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.

C. For design of temporary shoring and bracing, employ a Professional Engineer (Structural) experienced in design of this type of work and licensed in Alabama.

1.06 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Grade site areas to drain. Maintain excavations free of water. Provide, operate, and maintain dewatering equipment.

C. Protect site from pooling or running water. Provide water barriers as required to protect site from soil erosion.

D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

E. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent properties.
   1 Provide dust-proof enclosures to prevent entry of dust generated outdoors.

F. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
   1 Minimize amount of bare soil exposed at one time.
   2 Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

3 Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
4 Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

G. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
1 Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.
2 Indoors: Limit conduct of especially noisy interior work to the hours of 6 pm to 7 am.

H. Pest and Insect Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
1 Pest Control Service: Weekly treatments.

I. Rodent and vermin Control: Provide methods, means, and facilities to prevent rodents and vermin from accessing or invading premises.

J. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

A. See Section 01 1000 for occupancy-related requirements.

B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

C. Notify affected utility companies and comply with their requirements.

D. Prior to excavation, or any site preparation activities approval by the University is required through the Pre-Excavation Notification and sign off as well as the Site Prep Sign Off Approval Process

E. Utility Shutdown Requests: All necessary service interruptions of utilities of any type or magnitude shall be scheduled in advance with TU Project Manager. Major utility shutdowns shall be scheduled during non-business hours. Scheduling of shutdown shall be through prior submittal of written request in compliance with TU Utility Shutdown Protocol prior to any proposed shutdown, and awaiting approval. Minor utility service interruptions shall be scheduled with a minimum of five days prior notice.

F. `Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

G. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

H. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

I. Coordinate completion and clean-up of work of separate sections.

J. After Owner occupancy of project, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities. Access to student living units will not be available once students have moved in except to address warranty calls that require attention.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

G. Existing Utilities: The existing and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existing and location of underground utilities and other construction affecting the Work. Start of work means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. Conduct a preinstallation meeting at the site prior to commencing work for each construction activity that requires coordination with other construction.

B. Require attendance of parties directly affecting, or affected by, work of the specific section, including manufacturer's representative.

C. Schedule: Contractor to submit schedule of required and intended pre-installation meetings for Architect and Owner's review and concurrence.

D. Notify Architect and Owner one week minimum in advance of meeting date.

E. Contractor to prepare agenda and preside at meeting and discuss the following at a minimum:

1 Review conditions of examination, preparation and installation procedures.
2 Coordination with related work.
3 Testing and Inspection requirements.
4 Environmental conditions required for executing work.
5 Protection of completed work.
6 Schedule for installation, including required inspections.
7 Substrate and/or adjacent work acceptability and requirements/tolerances necessary for successful product installation.
8 Product Warranty.
9 Specification Section, submittals, product data, shop drawings.
10 Manufacturer's recommendations and requirements.
11 RFI's, ASI's and Change Orders related to work (if any).
12 Mockup review, comments and approval.
13 Environmental (temperature and humidity) requirements for storage and installation.
14 Weather requirements for installation.
15 Protection of adjacent work.
16 Installation procedures.

17 Sequence and coordination with adjacent work.

F. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made. Record significant discussions, agreements, disagreements, including required corrective measures and actions.

G. Do not proceed with installation if the conference cannot be successfully concluded.

H. Required Preinstallation Meetings (this is not a comprehensive list and is a minimum requirement):
1 Cast-in-Place Concrete (including elevator pit waterproofing, underslab vapor barrier and termite control)
2 Structural Steel
3 Metal Decking (floor and roof)
4 Floor Underlayment (03 5400)
5 Exterior Envelope (including Masonry, Masonry Cleaning, Precast Concrete, Cast Stone, Windows, Doors, Louvers, Sheathing, Moisture Barrier, Flashings, Sealants)
6 Roofing (including Decking, Steep and Low Slope Roofing, Gutters, Downspouts)
7 Firestopping
8 Door Frames
9 Doors
10 Door Hardware
11 Elevator
12 Flooring (Tile, Carpet Tile, Terrazzo, Fluid Applied Flooring, Chemical Staining and Sealing of concrete)
13 Gypsum Board Finishing and Painting
14 Millwork/Finish Carpentry
15 Finishes (wallcovering, tackable panels, etc)
16 Signage

3.04 LAYING OUT THE WORK

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

B. Promptly notify Architect of any discrepancies discovered.

C. Contractor shall locate and protect survey control and reference points.

D. Control datum for survey is that indicated on drawings.

E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

F. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

H. Utilize recognized engineering survey practices.

I. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

J. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
1 Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
2 Grid or axis for structures.
3 Building foundation, column locations, ground floor elevations.

K. Periodically verify layouts by same means.

L. Maintain a complete and accurate log of control and survey work as it progresses.

M. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.

B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

F. Make neat transitions between different surfaces, maintaining texture and appearance.

G. Coordination with other Contractors: Coordinate with other Contractors and allow site access to perform work on this site during the construction period on behalf of the Owner, specifically but not limited to work for Site Electrical, Data, and HW lines shown on the Civil Site Utility Plan, and irrigation installation.

3.06 "DRY-IN" REQUIREMENTS

A. The following minimum "dry-in" building conditions prior to installation of gypsum board wall and ceiling panels or any other interior material subject to degradation and environmentla growth include:
   1 Exterior sheathing and moisture barrier completely installed.
   2 Windows installed, or temporary (fixed in place) coverage over windows. If removed for construction purposes the temporary coverage shall be reinstalled by the end of each day.
   3 Roof decking with Ice and Water Shield fully installed (including over roof expansion joint locations).
   4 Temporary doors with spring hinges installed at all access points.

B. Incorporate planned "dry-in" date into overall project schedule.

3.07 TEMPORARY ENVIRONMENTAL CONDITIONS DURING CONSTRUCTION

A. Operation of MEP Systems: There are numerous interior finishes and products that require a stable interior environment (ie - temperature and humidity control, enclosed building, proper lighting levels, etc) to meet Specification requirements, Manufacturer's installation requirements, testing and industry standards. The Contractor shall schedule and properly sequence Work accordingly to accommodate all requirements for product installation.

B. Temperature, Humidity and ventilation Control: Provide adequate temporary heating and cooling equipment and distributed to regulate interior environment in order to meet construction sequencing and schedule needs during construction for all interior finishes (walls, floors, ceilings, fabrics and coatings), assemblies (doors, frames and hardware, equipment) furniture, casework, etc. DURING and ONGOING AFTER installation of materials.

C. Weathertight, self closing and latching / locking temporary doors with shall be installed at all access points.

D. HVAC Use During Construction: Use of the new HVAC systems during construction will require the Owner's approval and specified filters, requiring frequent replacement as well as duct protection to keep units and ductwork clean and free of construction dust and debris prior to Owner turnover.

E. Incorporate date for temporary mechanical systems into overall project schedule. Warranty shall be adjusted to reflect use during construction and shall not commence systems commissioning is successfully concluded and accepted by the Owner.

3.08 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1 Verify that construction and utility arrangements are as indicated.
   2 Report discrepancies to Architect before disturbing existing installation.
   3 Beginning of alterations work constitutes acceptance of existing conditions.

B. Maintain weatherproof exterior building enclosure. Do not create, or maintain openings in the exterior enclosure when inclement weather is imminent, or expected during working hours and do not leave openings without weather protection, when work hours have concluded..

1 Where openings in exterior enclosure exist, provide construction to maintain weatherproof continuity.

C. Remove existing work as indicated and as required to accomplish new work.
1 Remove items indicated on drawings.
2 Relocate items indicated on drawings.
3 Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
4 Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

D. Protect new installed work.
1 Prevent movement of structure; provide shoring and bracing if necessary.
2 Perform cutting to accomplish removals neatly and as specified for cutting new work.
3 Repair adjacent construction and finishes damaged during removal work.
4 Patch as specified for patching new work.

E. Comply with all other applicable requirements of this section.

3.09 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
1 Complete the work.
2 Fit products together to integrate with other work.
3 Provide openings for penetration of mechanical, electrical, and other services.
4 Match work that has been cut to adjacent work.
5 Repair areas adjacent to cuts to required condition.
6 Repair new work damaged by subsequent work.
7 Remove samples of installed work for testing when requested.
8 Remove and replace defective and non-complying work.

C. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and surfaces exposed to view.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.

J. Patching:
1 Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
2 Match color, texture, and appearance.
3 Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

K. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

L. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.

M. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.10 ONWER-FURNISHED/CONTRACTOR-INSTALLED PRODUCTS (O.F.C.I)

A. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for coordination of Owner's shipping and delivery of product(s) to site. Adjust the construction schedule as necessary based on mutually coordinated and agreeable timeline. Notify Owner if changes to schedule are required due to differences in actual construction progress.

B. Products On Site: Receive, take possession and unload products at site, and inspect for completeness or damage jointly with Owner. Provide enough space on-site for storing product as required by Manufacturer's requirements, including possible indoor or conditioned storage.

C. Preinstallation Conferences: Conduct preinstallation conferences to review required installation and subsurface preparation requirements for O.F.C.I. products.

D. Subsurface Preparation: Contractor is responsible for any and all required subsurface preparation (floor underlayment, membranes, blocking, painting, etc.) to comply with O.F.C.I. Manufacturer's installation requirements.

E. Installation Conditions: Provide all necessary installation conditions (building heating/air conditioning, air movement, humidity control, etc.) as necessary to comply with O.F.C.I. Manufacturer's installation and specification requirements.

F. Installation: Handle, store, install and finish O.F.C.I. products according to requirements form the Manufacturer and Specification sections included herein.

G. Protection: Store and protect O.F.C.I. products in accordance with manufacturer's instructions.

H. Repair: Repair or replace items damaged after receipt, and due to installation or construction sequencing and activities.

I. OFCI Items: The following items are intended by the Owner to be Owner-Furnished, Contractor-Installed or as described herein. These items include, but are not limited to:

1 VFD's owner furnished, installed and wired by the contractor. Startup by the Contractor.

2 Access Control Systems furnished and installed by the owner. GC to provide all conduit rough-in and pull tape needed for installation of access control wiring and devices.

3 Primary Site Electrical Package: All work is by the Contractor as referenced on Electrical drawings.

4 Landscaping, , topsoil and sod and including hardscape and irrigation, is by the General Contractor and its respective subcontractors.

5 Interior furniture and installation is provided by the owner, shown for reference only in the Drawings. Site furniture and accessories is provided and installed by the General Contractor.

6 Data cable is being provided and installed by the Owner, Contractor is responsible for installing conduit, cable tray, wall hooks shown to install cabling.

3.11 IN-WALL AND ABOVE-CEILING REVIEWS

A. Do not conceal anything prior to reviews.

B. Prior to review the following shall be complete: Pressure testing complete, pipes insulated, ducts insulated, firestopping completely installed at floors or ceilings, sprinkler piping fully installed, electrical fully installed. Batt insulation should NOT be installed because it will conceal review of the MEP installation.

C. Grouping: In-Wall and Above-Ceiling reviews prior to concealment shall be grouped into a minimum of all items on two floors at a time. Partial floors will not be reviewed, but multiple floors can be reviewed at the same time if the Work is ready for review.

D. Living Unit reviews can be performed separately from public areas (corridors, stairs and lobby/lounge areas).

E. Scheduling: Incorporate planned reviews into the overall project schedule, and update targeted dates every two weeks for proper coordination. Notify Owner and Architect a minimum of one week prior to actual review.

F. Contractor's Punchlist Review: Contractor to send their own punchlist review document for "in-wall" and "above-ceiling" review prior to the A/E review a minimum of 24 hours prior to the scheduled review.

3.12 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.13 PUNCHLIST REVIEW SCHEDULING

A. The following are minimum scheduling requirements for punchlist reivews:

1 Scheduling: Incorporate planned punchlist reviews into the overall project schedule, and update targeted dates at OAC meetings for proper coordination. Notify Owner and Architect in writing for each specific area a minimum of one week prior to actual review.

2 Grouping: Puchlist reviews shall be grouped into a minimum of all items on two floors at a time. Partial floors will not be reviewed. Living Unit reviews can be performed separately from public areas (corridors, stairs and lobby/lounge areas).

3 Contractor's Punchlist Review: Contractor to send their own complete punchlist review document for area a minimum of 48 hours prior to the A/E review.

3.14 EQUIPMENT INSTALLATION (BY OTHERS)

A. Complete work in thes room so that access back into room is not needed by workers, including completion of flooring, painted walls, ceiling, power, HVAC, door with lock for security, backboard, etc.

B. Access to this room after turned over to the Owner will not be allowed without permission.

3.15 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Prohibit traffic from landscaped areas.

H. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.16 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems with requirements of Divisions 22, 23 and 26

B. Notify Architect, Project Manager and owner seven days prior to start-up of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

E. Verify that wiring and support components for equipment are complete and tested.

F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.17 DEMONSTRATION AND INSTRUCTION

A. See Section 01 7900 - Demonstration and Training.

3.18 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

B. Testing, adjusting, and balancing HVAC systems: See mechanical specification sections.

3.19 FINAL CLEANING

A. Execute final cleaning prior to final project assessment. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.

B. Use cleaning materials that are nonhazardous.

C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Replace filters of operating equipment.

G. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.

H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner. Do not burn or bury.

3.20 MAINTENANCE

A. Provide warranty service and maintenance of components for the periods indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with manufacturer's recomendations to ensure reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 01 7010

PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS:

A. When project construction reaches 75% complete, a 75% Closeout Meeting with the UA Project Manager and the Contractor is required to review in detail all requirements for completing and closing out the project. When project construction reaches 95% complete, a Closeout Meeting with UA Contract Administration, the Contractor, Project Architect, and others as appropriate is required to further review requirements for project close out.

B. Except as noted, delivery of items listed hereunder are prerequisites for release of final retainage as indicated on the contractor's application for payment.

C. All required warranties and guarantees will commence upon date of Certificate of Substantial Completion.

D. Closeout Submittal Requirements:
   1 (1) copy of Operation and Maintenance manuals (properly tabbed and indexed). See General Conditions of the Contract and specification sections regarding Shop Drawings & Submittals. Operation and Maintenance manuals are to be submitted during construction but no later than 30 days prior to contract completion date.
   2 (1) Closeout Binder labeled "Closeouts" including UA project name and job number with all applicable items in order as listed under "Project Closeout Items"
   3 Electronic closeout submittals using the PDF master templates on Sharepoint Online project site:
      a. (1) copy of the Operation and Maintenance manuals
      b. (1) copy of all applicable "Project Closeout Items"

E. Projects must be closed within sixty (60) days of Certificate of Substantial Completion. (This means all closeout documents have been reviewed and accepted by The Awarding Authority.)

1.02 PROJECT CLOSEOUT ITEMS:

A. Furnish the following items in order to successfully close out a project:
   1 As-Built Drawings and specification mark-ups must be reviewed by project team for completeness
   2 Operation and Maintenance Manuals
      a. GC to upload into active projects Closeout Documents folder on Sharepoint Online (PDF Format)
      b. GC to submit one (1) hard copy with closeout binder
      c. A/E to provide confirmation on letterhead that all O&M's have been uploaded to Sharepoint Online
   3 Training sessions for Owner's personnel, as required per project specifications (Attendee sign-in sheets required)
   4 Certificate of Occupancy from City (original required)
   5 Approved HVAC Test and Balance Report and Documented Functional Performance Testing (by the Commissioning Agent, if applicable)
   6 Control Drawings are to be complete and available for review
   7 Fire Alarm Certification (copy is acceptable)
   8 State Elevator Inspection Report
   9 Boiler Inspection Report
   10 UA Project Manager to complete the following:
      a. Fill out and submit State Insurance Fund Form to Risk Management five (5) UA business days prior to substantial completion
      b. Confirm Design Team submitted AutoCAD 3D (.dwg) files of the site plan, site utility plans and site power plans to UA Surveying. Plans to be referenced to the Alabama West Zone Grid NAD 1983.
      c. If required, complete and submit the Capital Project Report (Attachment I to Board Rule 415) to the UA System Office.
   11 Construction Record Documents:
      a. "As-Built Drawings" - on Mylar reproducibles and labeled disk (CAD format)
         1) All field red-lines incorporated, external references bound and "As-Built" indicated in title block.
         2) Submit electronic copy to both A/E & UA plan room for approval prior to printing mylars.

b. Control Drawings (Bond Copy) - on Mylar reproducibles and labeled disk (PDF format)
c. Final Conformance Specifications - on labeled disk (PDF Format)
d. PM to provide transmittal from UA plan room confirming all of the above as received prior to closeout with Contract Administration

12 Advertisement of Completion - Certified by Tuscaloosa News (4 consecutive weeks and must provide original signature and notary seal)
13 UA Affidavit of Release of Liens - from GC only, on UA form (form is available on Sharepoint Online and in project specifications). Release of Liens - from GC and all subs
14 GC and Subcontractor Warranties - Standard (1) year (per Section 47 of General Conditions) & any extended that may be required
15 Extended Manufacturer's Warranties
16 Roof Warranties - Standard Five-Year (ABC Form C-9) plus additional as specified
17 Delivery of Maintenance Stock Items as required per project specifications - Furnish signed receipts
18 Receipt for return of all keys - Transmit to UA Project Manager or Field Coordinator
19 Elevator Requirements (if applicable, in addition to Item 9 above)
a. Executed elevator maintenance agreement (copy, if applicable)
b. Reminder: PM to confirm all elevator submittals to UA Elevator Systems Coordinator are complete
20 Termite Contract (copy is acceptable)
21 Fully Executed CERTIFICATE OF SUBSTANTIAL COMPLETION
22 GC to provide copy of executed Final Change Order Form as part of close-out binder
a. Cover sheet only with all signatures, must include all reconciliations (previous errors, allowances and /or unit prices)
23 CONSENT OF SURETY FOR FINAL PAYMENT (date of Power of Attorney must be same or later than date indicated on Consent of Surety)
24 Certification that final punch lists items have been completed
25 Utilities - Confirmation that all have been transferred into "UA" name
26 Construction Debris Report - Submit estimated tons of construction debris hauled off from project site on GC letterhead
27 Equipment List for Maintenance and Replacement Parts - Provide a list of all equipment (i.e. water heaters, air handlers, etc.) with model numbers, serial numbers and warranty periods. Include filter and belt list for each air handler unit.
28 Minority and Woman-Owned Business (MWB) Subcontracts Form

B. Items A.1 through A.10 above must be complete and reviewed by A/E prior to scheduling a final inspection with UA and are a condition precedent to issuing Certificate of Substantial Completion.

C. When applicable all Davis Bacon and DBE (Disadvantaged Business Enterprise) requirements must be reported and final submission on file with the UA before closeouts are considered complete.

D. Submission of other documentation may be required in the Specifications and Construction Drawings.

E. All closeout Documents are to be submitted within 45 days of substantial completion. If not submitted within 45 days the Awarding Authority, with no further notice required, may elect, at its sole discretion, acquire all outstanding required documents, and the actual cost thereof will be deducted from the contract.

1.03 INSPECTIONS

A. Final Inspection: For a Certificate of Substantial Completion (COSC) to be issued the Final Inspection must be conducted by the Architect, Engineers & UA and appropriate Public Officials upon notification by Contractor and concurrence by Architect, Engineer & UA that project is complete. Punch lists prepared at inspections shall be corrected within thirty days of the date of the COSC.

B. Year-End Inspection: To be conducted jointly by Architect, Engineer, UA and appropriate Public Officials approximately 1 year after completion and upon notice by Architect, Engineer, UA, and Public Officials. Any and all defects will be expected to be remedied as soon as possible.

END OF SECTION

SECTION 01 7012

PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS:

A. When project construction reaches 75% complete, a 75% Closeout Meeting with the Tuskegee Project Manager and the Contractor is required to review in detail all requirements for completing and closing out the project. When project construction reaches 95% complete, a Closeout Meeting with Tuskegee Contract Administration, the Contractor, Project Architect, and others as appropriate is required to further review requirements for project close out.

B. Except as noted, delivery of items listed hereunder are prerequisites for release of final retainage as indicated on the contractor's application for payment.

C. All required warranties and guarantees will commence upon date of Certificate of Substantial Completion.

D. Closeout Submittal Requirements:
   1 (1) copy of Operation and Maintenance manuals (properly tabbed and indexed). See General Conditions of the Contract and specification sections regarding Shop Drawings & Submittals. Operation and Maintenance manuals are to be submitted during construction but no later than 30 days prior to contract completion date.
   2 (1) Closeout Binder labeled "Closeouts" including Tuskegee project name and job number with all applicable items in order as listed under "Project Closeout Items"
   3 Electronic closeout submittals using the PDF master templates on Sharepoint Online project site:
      a. (1) copy of the Operation and Maintenance manuals
      b. (1) copy of all applicable "Project Closeout Items"

E. Projects must be closed within sixty (60) days of Certificate of Substantial Completion. (This means all closeout documents have been reviewed and accepted by The Awarding Authority.)

1.02 PROJECT CLOSEOUT ITEMS:

A. Furnish the following items in order to successfully close out a project:
   1 As-Built Drawings and specification mark-ups must be reviewed by project team for completeness
   2 Operation and Maintenance Manuals
      a. GC to upload into active projects Closeout Documents folder on Sharepoint Online (PDF Format)
      b. GC to submit one (1) hard copy with closeout binder
      c. A/E to provide confirmation on letterhead that all O&M's have been uploaded to Sharepoint Online
   3 Training sessions for Owner's personnel, as required per project specifications (Attendee sign-in sheets required)
   4 Certificate of Occupancy from City (original required)
   5 Approved HVAC Test and Balance Report and Documented Functional Performance Testing (by the Commissioning Agent, if applicable)
   6 Control Drawings are to be complete and available for review
   7 Fire Alarm Certification (copy is acceptable)
   8 State Elevator Inspection Report
   9 Boiler Inspection Report
   10 Tuskegee Project Manager to complete the following:
      a. Fill out and submit State Insurance Fund Form to Risk Management five (5) business days prior to substantial completion
      b. Confirm Design Team submitted AutoCAD 3D (.dwg) files of the site plan, site utility plans and site power plans to Tuskegee Surveying. Plans to be referenced to the Alabama West Zone Grid NAD 1983.
      c. If required, complete and submit the Capital Project Report (Attachment I to Board Rule 415) to the Tuskegee System Office.
   11 Construction Record Documents:
      a. "As-Built Drawings" - on Mylar reproducibles and labeled disk (CAD format)
         1) All field red-lines incorporated, external references bound and "As-Built" indicated in title block.

2) Submit electronic copy to both A/E & Tuskegee plan room for approval prior to printing mylars.

b. Control Drawings (Bond Copy) - on Mylar reproducibles and labeled disk (PDF format)

c. Final Conformance Specifications - on labeled disk (PDF Format)

d. PM to provide transmittal from Tuskegee plan room confirming all of the above as received prior to closeout with Contract Administration

12 Advertisement of Completion - Certified by Tuscaloosa News (4 consecutive weeks and must provide original signature and notary seal)

13 Tuskegee Affidavit of Release of Liens - from GC only, on Tuskegee form (and in project specifications). Release of Liens - from GC and all subs

14 GC and Subcontractor Warranties - Standard (1) year & any extended that may be required, or has been requested.

15 Extended Manufacturer's Warranties

16 Delivery of Maintenance Stock Items as required per project specifications - Furnish signed receipts

17 Receipt for return of all keys - Transmit to Tuskegee Project Manager or Field Coordinator

18 Termite Contract (copy is acceptable)

19 Fully Executed CERTIFICATE OF SUBSTANTIAL COMPLETION

20 GC to provide copy of executed Final Change Order Form as part of close-out binder

a. Cover sheet only with all signatures, must include all reconciliations (previous errors, allowances and /or unit prices)

21 CONSENT OF SURETY FOR FINAL PAYMENT (date of Power of Attorney must be same or later than date indicated on Consent of Surety)

22 Certification that final punch lists items have been completed

23 Utilities - Confirmation that all have been transferred into "Tuskegee" name

24 Construction Debris Report - Submit estimated tons of construction debris hauled off from project site on GC letterhead

25 Equipment List for Maintenance and Replacement Parts - Provide a list of all equipment (i.e. water heaters, air handlers, etc.) with model numbers, serial numbers and warranty periods. Include filter and belt list for each air handler unit.

26 Minority and Woman-Owned Business (MWB) Subcontracts Form

B. Items A.1 through A.10 above must be complete and reviewed by A/E prior to scheduling a final inspection with Tuskegee and are a condition precedent to issuing Certificate of Substantial Completion.

C. When applicable all DBE (Disadvantaged Business Enterprise) requirements must be reported and final submission on file with the Tuskegee Facilities Office before closeouts are considered complete.

D. Submission of other documentation may be required in the Specifications and Construction Drawings.

E. All closeout Documents are to be submitted within 45 days of substantial completion. If not submitted within 45 days the Awarding Authority, with no further notice required, may elect, at its sole discretion, acquire all outstanding required documents, and the actual cost thereof will be deducted from the contract by Change Order.

1.03 INSPECTIONS

A. Final Inspection: For a Certificate of Substantial Completion (COSC) to be issued the Final Inspection must be conducted by the Architect, Engineers, Tuskegee and appropriate Public Officials upon notification by Contractor and concurrence by Architect, Engineer & Tuskegee that project is complete. Punch lists prepared at inspections shall be corrected within 14 days of the date of the COSC.

B. Year-End Inspection: To be conducted jointly by Architect, Engineer, Tuskegee and appropriate Public Officials approximately 1 year after completion and upon notice by Architect, Engineer, Tuskegee, and Public Officials. Any and all defects will be expected to be remedied as soon as possible.

END OF SECTION

SECTION 01 7419

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as is feasible.

D. Recycling, Salvage, and Reuse: The following should not be disposed of in landfills or by incineration:
   1 Aluminum and plastic beverage containers.
   2 Corrugated cardboard.
   3 Wood pallets.
   4 Clean dimensional wood.
   5 Land clearing debris, including brush, branches, logs, and stumps; see Section 31 1000 - Site Clearing for use options.
   6 Concrete.
   7 Bricks.
   8 Concrete masonry units.
   9 Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   10 Glass.
   11 Gypsum drywall and plaster.
   12 Plastic buckets.
   13 Carpet, carpet cushion, carpet tile, and carpet remnants, both new and removed: DuPont (http://flooring.dupont.com) and Interface (www.interfaceinc.com) conduct reclamation programs.
   14 Asphalt roofing shingles.
   15 Paint.
   16 Rigid foam insulation.

E. Methods of trash/waste disposal that are not acceptable are:
   1 Burning on the project site.
   2 Burying on the project site.
   3 Dumping or burying on other property, public or private.
   4 Illegal dumping or burying.
   5 Unregulated incineration, either on- or off-site.

F. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: List of items to be salvaged from the existing building for relocation in project or for salvage to the Owner.

B. Section 01 3000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

C. Section 01 5020 - Temporary Controls: Additional requirements related to trash/waste collection and removal facilities and services.

D. Section 01 6000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

E. Section 01 7000 - Execution Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

F. Section 31 1000 - Site Clearing: Handling and disposal of land clearing debris.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01 1000 for list of items to be salvaged from the existing building for relocation in project or for Owner.

B. See Section 01 3000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

C. See Sections 01 5010 and 01 5020 for additional requirements related to trash/waste collection and removal facilities and services.

D. See Section 01 6000 for waste prevention requirements related to delivery, storage, and handling.

E. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

END OF SECTION

SECTION 01 7900

DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. Demonstration of products and systems where indicated in specific specification sections.

B. Training of Owner personnel in operation and maintenance is required for:
   1 All software-operated systems.
   2 HVAC systems and equipment.
   3 Plumbing equipment.
   4 Electrical systems and equipment.
   5 Landscape irrigation.
   6 Items specified in individual product Sections.

C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
   1 Roofing, waterproofing, and other weather-exposed or moisture protection products.
   2 Finishes, including flooring, wall finishes, ceiling finishes.
   3 Fixtures and fittings.
   4 Items specified in individual product Sections.

1.02 RELATED REQUIREMENTS

A. Section 01 7800 - Project Closeout: Operation and maintenance manuals.

B. Other Specification Sections: Additional requirements for demonstration and training.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Training Plan: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
   1 Submit to Architect for transmittal to Owner.
   2 Submit not less than two weeks prior to start of training.
   3 Revise and resubmit until acceptable.
   4 Provide an overall schedule showing all training sessions.
   5 Include at least the following for each training session:
      a. Identification, date, time, and duration.
      b. Description of products and/or systems to be covered.
      c. Name of firm and person conducting training; include qualifications.
      d. Intended audience, such as job description.
      e. Objectives of training and suggested methods of ensuring adequate training.
      f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
      g. Media to be used, such a slides, hand-outs, etc.
      h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.

C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
   1 Include applicable portion of O&M manuals.
   2 Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
   3 Provide one extra copy of each training manual to be included with operation and maintenance data.

D. Training Reports:
   1 Identification of each training session, date, time, and duration.
   2 Sign-in sheet showing names and job titles of attendees.
   3 List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.

E. Video Recordings: Submit digital video recording of each demonstration and training session for Owner's subsequent use.
   1 Format: DVD Disc.
   2 Label each disc and container with session identification and date.

1.04 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
   1 Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
   2 Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.

B. Demonstration may be combined with Owner personnel training if applicable.

C. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
   1 Perform demonstrations not less than two weeks prior to Substantial Completion.
   2 For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
   1 Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL

A. Conduct training on-site unless otherwise indicated.

B. Owner will provide classroom and seating at no cost to Contractor.

C. Provide training in minimum two hour segments.

D. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.

E. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
   1 The location of the O&M manuals and procedures for use and preservation; backup copies.
   2 Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
   3 Typical uses of the O&M manuals.

F. Product- and System-Specific Training:
   1 Review the applicable O&M manuals.
   2 For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
   3 Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
   4 Provide hands-on training on all operational modes possible and preventive maintenance.
   5 Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
   6 Discuss common troubleshooting problems and solutions.
   7 Discuss any peculiarities of equipment installation or operation.

8 Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
9 Review recommended tools and spare parts inventory suggestions of manufacturers.
10 Review spare parts and tools required to be furnished by Contractor.
11 Review spare parts suppliers and sources and procurement procedures.

G. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

SECTION 02 4250

SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of building elements for alteration and renovation purposes.

B. Abandonment and removal of existing utilities.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Specific requirements for Contractor's use of site and premises.

B. Section 01 1000 - Summary: Sequencing and staging requirements.

C. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and reinstallaation.

D. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

E. Section 01 7419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.

1 Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades.

2 Include a summary of safety procedures.

C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SCOPE

A. Remove existing construction of the buildings as shown on the Drawings in an ordered sequence so as not to compromise the integrity of the structural system, or otherwise create an unsafe condition:

B. Remove other items indicated, for salvage, relocation, and / or recycling as indicated.

C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 01 7000.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1 Obtain required permits.

2 Comply with applicable requirements of NFPA 241 .

3 Use of explosives is not permitted.

4 Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.

5 Provide, erect, and maintain temporary barriers and security devices.

6 Conduct operations to minimize effects on and interference with adjacent areas and occupants.

7 Do not close or obstruct roadways or sidewalks.
8 Conduct operations to avoid obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

C. Do not begin removal until receipt of notification to proceed from Owner.

D. Do not begin removal until built elements to be salvaged or relocated have been removed.

E. Protect existing structural components and other elements that are not to be removed.
1 Provide bracing and shoring.
2 Prevent movement or settlement.

F. If suspected hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

G. Perform demolition in a manner that maximizes salvage and recycling of materials.
1 Comply with requirements of Section 01 7419 - Waste Management.
2 Dismantle existing construction and separate materials.
3 Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner and establish a "Fire Watch" if life safety system(s) must be inactive for any period.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; or be reworked. Mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities completely.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone and below the floor substrate; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
1 Verify construction and utility arrangements shown, noted or otherwise indicated.
2 Report discrepancies to Architect before disturbing existing installation.
3 Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Remove existing work as indicated and as required to accomplish new work.
1 Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
2 Remove items indicated on drawings.

C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
1 Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
2 Where existing active systems serve occupied facilities but are to be affected by installation of new equipment, maintain existing systems in service until new systems are complete and ready for service.

3 See Section 01 1000 for other limitations on outages and required notifications.
4 Verify that abandoned services serve only abandoned facilities before removal.
5 Remove abandoned pipe, ducts, conduits, and equipment , including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site regularly, but no less than weekly intervals.

B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 7419 - Waste Management.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 3010

MISCELLANEOUS CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete reinforcement.

B. Joint devices associated with concrete work.

C. Miscellaneous concrete elements, including repairing damage to and infill of penetrations in existing concrete surfaces and flatwork incurred during demolition activities.

D. Concrete curing.

1.02 RELATED REQUIREMENTS

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 01 2100 - Allowances, for additional cost pricing requirements.

B. Concrete - Grouting: Includes preparation of substrate, grout, placement, consolidating, troweling, and curing. Measurement by the cubic yard.

1.04 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; American Concrete Institute International; 2006.

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2002).

C. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2005.

D. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (errata 2007).

E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.

F. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 1999.

G. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 1988 (Reapproved 2002).

H. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).

I. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2008.

J. ACI 347 - Guide to Formwork for Concrete; American Concrete Institute International; 2004.

K. ASTM A 185/A 185M - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete; 2007.

L. ASTM A 497/A 497M - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete; 2007.

M. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2007.

N. ASTM A 767/A 767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2005.

O. ASTM A 775/A 775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars; 2007b.

P. ASTM A 884/A 884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement; 2006.

Q. ASTM C 33 - Standard Specification for Concrete Aggregates; 2007.

R. ASTM C 39/C 39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2005.

S. ASTM C 94/C 94M - Standard Specification for Ready-Mixed Concrete; 2007.

T. ASTM C 143/C 143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2008.

U. ASTM C 150 - Standard Specification for Portland Cement; 2007.

V. ASTM C 171 - Standard Specification for Sheet Materials for Curing Concrete; 2007.

W. ASTM C 173/C 173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2008a.

X. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete; 2006.

Y. ASTM C 309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2007.

Z. ASTM C 330 - Standard Specification for Lightweight Aggregates for Structural Concrete; 2005.

AA. ASTM C 494/C 494M - Standard Specification for Chemical Admixtures for Concrete; 2008a.

AB. ASTM C 618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2008a.

AC. ASTM C 685/C 685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2007.

AD. ASTM C 881/C 881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2002.

AE. ASTM C 1059 - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 1999 (Reapproved 2008).

AF. ASTM C 1107/C 1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2008.

AG. ASTM C 1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2005.

AH. ASTM D 994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type); 1998 (Reapproved 2003).

AI. ASTM D 1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2008).

AJ. ASTM E 1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 1996 (Reapproved 2008).

AK. ASTM E 1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2009.

AL. COE CRD-C 48 - Method of Test for Water Permeability of Concrete; 1992.

AM. COE CRD-C 513 - COE Specifications for Rubber Waterstops; Corps of Engineers; 1974.

AN. COE CRD-C 572 - Corps of Engineers Specifications for Polyvinylchloride Waterstop; Corps of Engineers; 1974.

AO. NSF 61 - Drinking Water System Components - Health Effects; 2009.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements.

C. Samples: Submit two, 6 inch long samples of waterstops and construction joint devices.

D. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction for concrete accessories.

E. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.06 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.
   1 Maintain one copy of each document on site.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Follow recommendations of ACI 306R when concreting during cold weather.

PART 2 PRODUCTS

2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI 347 to provide formwork that will produce concrete complying with tolerances of ACI 117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1 Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
   2 Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
   3 Form Ties: External to forms without any penetration of the form or the finished concrete. Patched penetrations are not permitted.

2.02 REINFORCEMENT

A. Reinforcing Steel: ASTM A 615/A 615M Grade 40 (280).
   1 Type: Deformed billet-steel bars.
   2 Finish: Unfinished, unless otherwise indicated.

B. Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain type.
   1 Form: Flat Sheets.
   2 Mesh Size and Wire Gage: As indicated on drawings.

C. Reinforcement Accessories:
   1 Tie Wire: Annealed, minimum 16 gage.
   2 Provide stainless steel, galvanized, or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C 150, Type IIIA - Air Entraining White Portland Cement.
   1 Acquire all cement for entire project from same source.

B. Fine and Coarse Aggregates: ASTM C 33.
   1 Acquire all aggregates for entire project from same source.

C. Lightweight Aggregate: ASTM C 330.

D. Fly Ash: ASTM C 618, Class C or F.

E. Calcined Pozzolan: ASTM C 618, Class N.

F. Silica Fume: ASTM C 1240, proportioned in accordance with ACI 211.1.

G. Water: Clean and not detrimental to concrete.

2.04 CHEMICAL ADMIXTURES

A. Chemical Admixtures are to be submitted for approval by the Architect or Structural Engineer prior to use and are to be submitted as part of the required design mix.

B. Chemical Admixture Manufacturers:
   1 Euclid Chemical (216) 531-9222 / www.euclidchemical.com..
   2 Grace Construction Products (617) 876-1400 ; www.grace.com .
   3 Substitutions: See Section 01 6000 - Product Requirements.

C. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

D. Air Entrainment Admixture: ASTM C 260.
   1 Acceptable Products:
      a. Euclid Chemical Product AIR MIX 200; www.euclidchemical.com.
      b. Grace Construction Products Product Darex® II AEA; www.grace.com .
      c. Substitutions: See Section 01 6000 - Product Requirements.

E. High Range Water Reducing Admixture: ASTM C 494/C 494M Type F.
   1 Acceptable Products:
      a. Euclid Chemical Product EUCON 1037; www.euclidchemical.com.
      b. Grace Construction Products Product ADVA® 360 ; www.grace.com.

2.05 BONDING AND JOINTING PRODUCTS

A. Latex Bonding Agent: Non-dispersible acrylic latex, complying with ASTM C 1059 Type II.

B. Epoxy Bonding System: Complying with ASTM C 881/C 881M and of Type required for specific application.

C. Reglets: Formed steel sheet, galvanized, with temporary filler to prevent concrete intrusion during placement.
   1 Size: 1/2 inch throat, 1/2 inch deep.

D. Joint Filler: Nonextruding, resilient asphalt impregnated fiberboard, felt, or cork, complying with ASTM D 1751, 1/4 inch thick and 4 inches deep; tongue and groove profile.

E. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with minimum 1 inch diameter holes for conduit or rebars to pass through at 6 inches on center; ribbed steel stakes for setting.
   1 Provide removable plastic cap strip that forms wedge-shaped joint for sealant installation.
   2 Height: To suit slab thickness.

F. Sealant and Primer: As specified in Section 07 9005.

2.06 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
   1 For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.

D. Normal Weight Concrete:
   1 Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: 3,000 psi.
   2 Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
   3 Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
   4 Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
   5 Water-Cement Ratio: Maximum 40 percent by weight.
   6 Total Air Content: 4 percent, determined in accordance with ASTM C 173/C 173M.
   7 Maximum Slump: 4 inches.
   8 Maximum Aggregate Size: 3/4 inch.

2.07 MIXING

A. Transit Mixers: Comply with ASTM C 94/C 94M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Verify that forms are clean and free of rust before applying release agent.

C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

1 Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
2 Use latex bonding agent only for non-load-bearing applications.

E. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

F. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.03 INSTALLING REINFORCEMENT

A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Notify Architect not less than 24 hours prior to commencement of placement operations.

D. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

E. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.

F. Separate slabs on grade from vertical surfaces with joint filler.

G. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

H. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07 9005 for finish joint sealer requirements.

I. Install joint devices in accordance with manufacturer's instructions.

J. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

K. Install joint device anchors for expansion joint assemblies specified in Section 07 9513. Maintain correct position to allow joint cover to be flush with floor and wall finish.

L. Apply sealants in joint devices in accordance with Section 07 9005.

M. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

N. Place concrete continuously between predetermined expansion, control, and construction joints.

O. Do not interrupt successive placement; do not permit cold joints to occur.

P. Place floor slabs in saw cut pattern indicated.

Q. Saw cut joints within 24 hours after placing. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.

R. Screed floors level, maintaining surface flatness of maximum 3/16 inch in 10 ft.

3.05 CONCRETE FINISHING

A. Repair surface defects, immediately after removing formwork.

B. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:

1 Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and terrazzo with full bed setting system.
2 Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 301.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, thin set quarry tile, and thin set ceramic tile.
3 Steel trowel surfaces that will be left exposed, or Polished.
a. Chemical Hardener: After slab has cured, apply water-diluted hardener in three coats per manufacturer's instructions, allowing 24 hours between coats.

C. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

3.06 CURING AND PROTECTION

A. Comply with requirements of ACI 308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
1 Normal concrete: Not less than 7 days.
2 High early strength concrete: Not less than 4 days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. Surfaces Not in Contact with Forms:
1 Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
2 Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water-fog spray or saturated burlap.
3 Final Curing: Begin after initial curing but before surface is dry.
a. Moisture-retaining cover: Seal in place with waterproof tape or adhesive. Do not weigh down.
b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.07 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.

E. Compressive Strength Tests: ASTM C 39/C 39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.

F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C 143/C 143M.

3.08 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.09 SCHEDULE - AS SHOWN ON DRAWINGS.

END OF SECTION

SECTION 03 5400

SELF LEVELING UNDERLAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fluid-applied, self-leveling, portland cement based floor underlayment.
   1 Cementitious type at To be installed at an average of 1 inch in thickness at all existing interior concrete substrates which are scheduled to receive a finish floor material , or coating.

1.02 RELATED REQUIREMENTS

A. Section 01 7000 - Execution and Closeout Requirements.

B. Section 01 2100 - Allowances

C. Section 03 3000 - Cast-in-Place Concrete.

D. Division 9 - Finishes.

1.03 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2020a.

B. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2012.

C. ASTM C348 - Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars; 2020.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2020.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data sheets documenting physical characteristics and product limitations of underlayment materials. Include information on mixing instructions.

C. Show method for protecting gypsum board and other materials subject to damage/degradation from contact with underlayment installation.

D. Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Instructions.

1.05 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the work of this section, and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

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

B. Keep dry and protect from direct sun exposure, freezing, and ambient temperature greater than 105 degrees F.

1.07 MOCK-UP

A. Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1 Prepare mock-up in location designated by Architect.
   2 Area: min. 10 ft x 10 ft.
   3 Do not proceed with underlayment work until workmanship of mock-up has been approved by Architect.

B. Mock-up may not remain as part of the Work.

1.08 PRE-INSTALLATION MEETING

A. Convene a minimum of one week before starting work of this section, but not before construction and approval of mock-up and all related submittals.

1.09 FIELD CONDITIONS

A. Do not install underlayment until floor penetrations and peripheral work are complete.

B. Maintain minimum ambient temperatures of 50 degrees F 24 hours before, during and 72 hours after installation of underlayment.

C. During the curing process, ventilate spaces to remove excess moisture.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Cementitious Underlayment:
   1 ARDEX Engineered Cements; ARDEX K 15® Premium Self Leveling Underlayment: www.ardexamericas.com.
   2 Custom® Building Products; LevelLite® Self-Leveling Underlayment: www.custombuildingproducts.com.
   3 ProSpec, an Oldcastle brand; Level Set 200: www.prospec.com.
   4 USG; USG Durock® Brand UltraCap® Self-Leveling Underlayment is ideal : www.usg.com.
   5 Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Cast Underlayments, General:
   1 Comply with applicable code for combustibility or flame spread requirements.

B. Cementitious Underlayment: Blended cement mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling underlayment with the following properties:
   1 Compressive Strength: Minimum _____ pounds per square inch after 28 days, tested per ASTM C109/C109M.
   2 Flexural Strength: Minimum 1000 psi after 28 days, tested per ASTM C348.
   3 Density: 125 pounds per cubic foot, nominal.
   4 Final Set Time: 1-1/2 to 2 hours, maximum.
   5 Thickness: Capable of thicknesses from feather edge to maximum 3-1/2 inch.
   6 Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E84.

C. Aggregate: Dry, well graded, washed silica aggregate, approximately 1/8 inch in size and acceptable to underlayment manufacturer.

D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to underlayment mix materials.

E. Primer: Manufacturer's recommended type.

F. Joint and Crack Filler: Latex based filler, as recommended by manufacturer.

2.03 MIXING

A. Site mix materials in accordance with manufacturer's instructions.

B. See Note in part 3 regarding the dispoosal of excess material and cleaning of equipment.

C. Add aggregate for areas where thickness will exceed 1/2 inch. Mix underlayment and water for at least two minutes before adding aggregate, and continue mixing to assure that aggregate has been thoroughly coated.

D. Mix to self-leveling consistency without over-watering.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate.

3.02 PREPARATION

A. Concrete: Mechanically prepare steel troweled concrete to create a textured surface necessary to achieve the best bond; acceptable methods include bead blasting and scarifying. Do not use acid etching.

B. Remove substrate surface irregularities. Fill voids and deck joints with filler. Finish smooth.

C. Vacuum clean surfaces.

D. Prime substrate in accordance with manufacturer's instructions. Allow to dry. Protect adjacent gypsum board and other materials subject to damage/degradation from contact with primer installation.

E. Close floor openings.

F. Protect gypsum board and other materials subject to damage/degradation from contact with underlayment installation.

3.03 APPLICATION

A. Install underlayment in accordance with manufacturer's instructions.

B. Pump or pour material onto substrate. Do not retemper or add water.
   1 Pump, move, and screed while the material is still highly flowable.
   2 Do not create cold joints.
   3 Wear spiked shoes while working in the wet material to avoid leaving marks.

C. Place to indicated thickness, with top surface level to 1/8 inch in 10 ft.

D. Place to thickness as indicated, including sloping as noted on Drawings.

E. For final thickness over 1-1/2 inches, place underlayment in layers. Allow initial layer to harden to the point where the material has lost its evaporative moisture. Immediately prime and begin application of the subsequent layer within 24 hours, or the minimum allowed by manufacturer.
   1 Provide Manufacturer's recommended reinforcement material, or additional aggregate

F. Place after partition installation, protect gypsum board during installation.

G. Where additional aggregate has been used in the mix, add a top layer of neat mix (without aggregate), if needed to level and smooth the surface.

H. If a fine, feathered edge is desired, steel trowel the edge after initial set, but before it is completely hard.

3.04 CURING

A. Once underlayment starts to set, prohibit foot traffic until final set has been reached.

B. Air cure in accordance with manufacturer's instructions.

3.05 APPLICATION TOLERANCE

A. Top Surface: Level to 1/8 inch in 10 ft.

3.06 FIELD QUALITY CONTROL

A. An independent testing agency will perform field inspection and testing, as specified in Section 01 4000 - Quality Requirements.

B. Placed Material: Agency will inspect and test for compliance with specification requirements.

C. **NOTE : Excess material shall not be disposed of into sinks, tubs, or in any manner which could cause it to enter a sanitary drain system. Likewise, cleaning of tools, buckets, equipment or any implements used for installation of the material shall not occur using any water source adjacent to, or which empties into any part of a sanitary drainage system.**

3.07 PROTECTION

A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.

B. Do not permit traffic over unprotected floor underlayment surfaces.

C. SCHEDULE (See Drawings)

END OF SECTION

SECTION 04 0100

MASONRY CLEANING AND RESTORATION

PART 1 GENERAL

1.01 NOTE: CONTRACTOR OWNER SHALL PERFORM INITIAL, PRIMARY CLEANING OF THE EXISTING MASONRY SURFACES, BUT SHALL PERFORM NO REPAIRS OR RESTORATION. CONTRACTOR'S MASONRY SUBCONTRACTOR, OR RESTORATION CLEANING SUBCONTRACTOR, SHALL PERFORM ANY FINAL, OR SPECIALTY CLEANING, SUCH AS DEEP MINERAL STAINING, PAINT REMOVAL, ETC. WHICH MAY EXIST AFTER THE INITIAL CLEANING AND FINAL RE-CLEANING OF RESTORED AND REPAIRED AREAS, PRIOR TO THE APPLICATION OF A WEATHER SEAL COATING.

1.02 SECTION INCLUDES

A. Low pressure Water, Chemical, and , or Detergent cleaning of existing and newly installed Brick and Concrete Masonry surfaces as directed by the Architect and as indicated on the Drawings. including, but not limited to the following conditions:

B. Repair and Restoration of exterior brick masonry shall include, but not be limited to the following conditions:
   1 Cracked Units
   2 Loose Units
   3 Spalled Units
   4 Open Mortar head and bed joints
   5 Deteriorated Mortar Joints
   6 Missing or Clogged Weeps
   7 Plant and Algae Growth
   8 Efflorescence
   9 Stains
   10 Water Penetration
   11 Control Jointing (Lack of Control Joints)

C. Repair, cleaning and refinishing of damaged and deteriorated Cast Stone Masonry and any Cast in Place Architectural Concrete.

D. NOTE: Blast cleaning, of brick unit masonry, glass block, or Architectural concrete masonry surfaces is not permitted in any form (high pressure water, steam, or dry blast media) for any reason.

E. Replacement of broken, damaged, deteriorated and missing brick Masonry units.

F. Repointing mortar joints.

1.03 RELATED REQUIREMENTS

A. Section 047 200 - Cast Stone.

B. Section 04 2000 - Unit Masonry Assemblies: New Brick, Mortar and Grout.

1.04 PRICE AND PAYMENT PROCEDURES

A. See Section 01 2200 - Unit Prices and Quantity Allowances for additional unit price requirements for Masonry Restoration, if any.

1.05 REFERENCE STANDARDS

A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2016.

B. ACI 530.1/ASCE 6/TMS 602 - Specification for Masonry Structures; American Concrete Institute International; 2008.

C. IMIAWC (CW) - Recommended Practices & Guide Specifications for Cold Weather Masonry Construction; International Masonry Industry All-Weather Council; 1993.

D. IMIAWC (HW) - Recommended Practices & Guide Specifications for Hot Weather Masonry Construction; International Masonry Industry All-Weather Council; current edition.

E. The Brick Industry Association: TECHNICAL NOTES on Brick Construction:
   1 Tech Note # 7 Water Penetration Resistance - Design and Detailing - Barrier Walls.
   2 Tech Note # 8 Mortars for Brick work.

3 Tech Note # 20 Cleaning Brickwork
4 Tech Note # 46: Maintenance of Brick Masonry.

1.06 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a minimum of 7 calendar days prior to commencing the work of this section, but not before all required selections have been made, submittals approved and sample panel(s) and Mockup have been constructed and approved.
1 Require attendance of parties directly affecting work of this section, or affectd by the work of this section.
2 Review conditions of application, procedures, and coordination with related work.

B. Scheduling:
1 Perform cleaning of masonry as permitted by the Owner 7 am - 6 pm only.

1.07 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on cleaning compounds.

C. Samples: Submit four samples of precast concrete, cast stone, and face brick units to illustrate matching color, texture and extremes of color range.

D. Manufacturer's Instructions: For cleaning materials and procedures, as well as any conditions requiring special attention.

1.08 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
1 Maintain one copy of each document at project site.

B. Masonry Restorer: Company specializing in masonry restoration of both brick and Architectural concrete employing skilled masons and supervisors having a minimum of 15 years of documented experience not necessarily with the same masonry contracting company.

1.09 MOCK-UP

A. Clean, restore and repoint an existing masonry wall area with a minimum size of 8 feet long by 12 feet high; include complete repointing of mortar in mocked-up area and include window opening instances of mortar.

B. Provide cleaning demonstration initially on sample panels as directed.

C. Perform final cleaning demonstration on completed mock-up of exterior wall construction as shown on the Drawings and.referenced in Section 01 4310 - Quality Assurance Mockup Requirements.
1 Clean an area 8 ft long by 12 ft high of existing masonry to determine extent and effects of masonry cleaner on the masonry assemblies.
2 Repeat, using different cleaning methods and products until acceptable.
a. Repeat, using same, or alternate cleaning methods for up to three different panels.

D. Acceptable panel and procedures employed will become the standard for work of this section.

1.10 PRE-INSTALLATION MEETING

A. Convene a minimum of 48 hours prior to commencing work of this section.

B. Require attendance of parties directly affecting work of this section, or impacted by the Work of this section including but not limited to:
1 General Contractor Project Manager and Superintendent
2 Masonry Restoration Subcontractor
3 Material manufactuerer's technical field representatives.
4 Owner Representatives
5 Architect.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry cleaning materials neatly stacked and tied on pallets. Store clear of ground with adequate waterproof covering.

1.12 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

1.13 PROJECT CONDITIONS

A. Perform any repointing before cleaning masonry surfaces.

B. Perform cleaning to exterior masonry between the hours of at times designated by the Owner's Project Manager..

C. Do not allow cleaning runoff to drain into sanitary or storm sewers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Restoration and Cleaning Chemical Schedule: Basis of Design per Category as follows:

1 **Exterior Cleaning** : To be used on Brick Masonry, Decorative Precast Concrete and Cast Stone;

a. **General Cleaner: EaCo Chem Inc Product: OneRestore® www.eacochem.com**

b. **Light-to-moderate Iron and Copper Stain Removal**: Sure Klean® Light Duty Concrete Cleaner

c. **Heavy- to-severe Iron Stain Removal**: PROSOCO®Sure Klean® Heavy Duty Concrete Cleaner or Sure Klean® Custom Masonry Cleaner.

d. **Heavy Copper Stain Removal**: Sure Klean® ReNew OR Sure Klean® 515 Copper Stain Remover (Part A and B)

e. **Biological Growth Removal**: Enviro Klean® ReKlaim

2 **Exterior Cleaning/Paint Stripping**:

a. **Paint removal: 3 Coats, or less**: Enviro Klean® SafStrip

b. **Paint removal: Multiple coats**: Sure Klean® Heavy Duty Paint Stripper

3 **Surface prep and Cleaning of Architectural Concrete and Cast Stone to receive new waterproof finish coat:**

a. EaCo Chem Inc Product: OneRestore® www.eacochem.com

B. Other Acceptable Manufacturers

1 Diedrich Technologies, Inc: www.diedrichtechnologies.com.

2 PROSOCO®; Product Enviro Klean® 2010 All Surface Cleaner : www.prosoco.com.

3 Substitutions: See Section 01 6000 - Product Requirements.

2.02 CLEANING MATERIALS

A. Cleaning Agent: Detergent type.

2.03 MORTAR MATERIALS

A. Conform to requirements of Section 04 2000.

2.04 MASONRY MATERIALS

A. Brick: Section 04 2000 - Unit Masonry Assemblies.

B. Cast Stone : Section 04 7200 - Cast Stone..

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces to be cleaned are ready for work of this section.

3.02 PREPARATION

A. Protect surrounding elements from damage due to cleaning activities.

B. Carefully remove and store removable items located in areas to be restored, including fixtures, fittings, finish hardware, and accessories; reinstall upon completion.

C. Separate areas to be protected from restoration areas using means adequate to prevent damage.

D. Cover any existing landscaping to be protected with tarpaulins or similar covers.

E. Mask immediately adjacent surfaces with material that will withstand cleaning and restoration procedures.

F. Close off adjacent openings with weatherproof closures.

G. When using cleaning methods that involve water or other liquids, install drainage devices to prevent runoff over adjacent surfaces unless those surfaces are impervious to damage from runoff.

H. Do not allow cleaning runoff to drain into sanitary or storm sewers.

3.03 REBUILDING

A. Cut out damaged and deteriorated masonry with care in a manner to prevent damage to any adjacent remaining materials.
   1 Remove brick masonry by "toothing" back to sound material, and not cutting material to remain in the wall.
   2 Remove additional loose or unsound adjoining masonry and mortar as directed which occurs from preceeding demolition activities.

B. Support structure as necessary in advance of cutting out units.

C. Cut away remaining loose or unsound adjoining masonry to provide firm and solid bearing for new work.

D. Build in new units following procedures for new work specified in other section(s).

E. Mortar : Colored and proportioned to match existing work.

F. Install built in masonry work to match and align with existing, with joints and coursing true and level, faces plumb and in line. Build in all openings, accessories and fittings.

G. All new brick and mortar shall match existing when viewed from 20 feet for 5 seconds. Non-matching construction shall be rebuilt or stained to match.

3.04 REPOINTING

A. Perform any required repointing and allow mortar to cure prior to cleaning masonry surfaces.

B. Cut out loose or disintegrated mortar in joints to minimum 5/8 - 3/4 inch depth or until sound mortar is reached.

C. Use power tools only after test cuts determine no damage to masonry units will result.

D. Do not damage masonry units.

E. When cutting is complete, remove dust and loose material by brushing.

F. Premoisten joint and apply mortar. Pack tightly in maximum 1/4 inch layers. Form a smooth, compact tooled joint to match existing.

G. Moist cure for 72 hours.

H. All pointing mortar shall match existing when viewed from 20 feet for 5 seconds. Non-matching construction shall be rebuilt or stained to match.

3.05 CLEANING EXISTING MASONRY

A. Owner will clean building prior to bid. Most staining will be removed by owner. The cleaning scope of work for this project will be limited to isolated, deep organic and metallic staining. Contractor is responsible for inspecting the building prior to bid and adjusting bid accordingly.

B. Low Pressure hot water cleaning: Apply 500 psi maximum pressure to a test area of each type masonry surfaces at designated locations, maintaining uniform depth and surface texture throughout.

C. Cleaning Detergent, or mild chemical: Spray clean masonry surfaces at designated locations with cleaning agent in accordance with the manufacturer's instructions. Saturate entire masonry surface with clean water and flush loose mortar and dirt.

3.06 CLEANING NEW MASONRY

A. Verify mortar is fully set and cured.

B. Prior to prewetting, clean surfaces and remove large particles with wood scrapers, brass or stiff nylon wire brushes.

C. Pre-wet finished masonry surfaces prior to application of cleaning agent solution. Scrub surfaces thoroughly using stiff brush. Thoroughly rinse and wash off cleaning solution, dirt and mortar crumbs using clean, low pressure ($\leq$ 600 psi) cold water.

D. Protect area below cleaning operation and keep masonry soaked with water and flushed free of acid and dissolved mortar continuously for duration of cleaning.

E. Before solution dries, rinse and remove remaining solution and dissolved mortar, using clean, low pressure water spray .

3.07 RESTORATION CLEANING

A. Clean surfaces and remove large particles with wood scrapers or non-ferrous wire brush.

B. Spray coat each different type masonry with specified restoration cleaner, mixed into solution in accordance with manufacturer's instructions.

C. Provide a second application if required to match mock-up area.

D. Allow sufficient time for solution to remain on masonry and agitate with soft fiber brush or sponge.

E. Rinse from the bottom up with potable water applied at 400 psi and at a rate of 4 gal/min.

3.08 AGING

A. Rub in new masonry work to match, as close as possible, adjacent original work.
   1 Use carbon black in small amounts, rubbing in well with burlap rags.

B. After each application, dust off surplus and wash down with low pressure hose. Allow surface to dry before proceeding with succeeding applications.

C. Continue process until acceptance.

3.09 CLEANING

A. Immediately remove stains, efflorescence, or other excess pointing or cleaning material resulting from the work of this section.

B. Remove excess mortar, smears, and droppings as work proceeds and upon completion.

C. Clean surrounding surfaces with approved cleaning materials.

3.10 SCHEDULES SEE DRAWINGS

END OF SECTION

SECTION 04 2000
UNIT MASONRY ASSEMBLIES
PART 1 GENERAL
1.01 SECTION INCLUDES

A. Clay facing brick.

B. Mortar and grout.

C. Reinforcement and anchorage.

D. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 04 0100 - Masonry Cleaning and Restoration.

B. Section 06 1000 - Rough Carpentry: Nailing strips built into masonry.

C. Section 07 2500 - Weather Barriers: Water-resistive barriers applied to exterior face of backing sheathing or unit masonry substrate.

D. Section 07 2700 - Air Barriers: Air barriers applied to exterior face of backing sheathing or unit masonry substrate.
1 Section 07 6200 - Sheet Metal Flashing and Trim: Exposed masonry flashings.

E. Section 07 8400 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.

F. Section 07 9200 - Joint Sealants: Sealing material transitions, control and expansion joints.

1.03 REFERENCE STANDARDS

A. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 2008.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2020.

D. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.

F. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

G. ASTM C91/C91M - Standard Specification for Masonry Cement; 2018.

H. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units; 2020.

I. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.

J. ASTM C150/C150M - Standard Specification for Portland Cement; 2020.

K. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.

L. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019.

M. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2018.

N.

O. ASTM C1634 - Standard Specification for Concrete Facing Brick; 2017.

P. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015.

Q. BIA - Brick Industry Association - Technical Notes on Brick Construction.

R. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene the preinstallation meeting one week before starting work of this section; require attendance by all relevant installers of work affected by masonry or which affects the installation of the masonry. Dependent upon sequencing of the Work the following may require attendance including:
   1 General Contractor
   2 Masonry subcontractor.
   3 Waterproofing / Caulking and Sealant subcontractor

B. Do not schedule a preinstallation meeting before all submittals, samples and mock-up have been completed and approved.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

1.06 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type and size of the following:
   1 Masonry units.
      a. For exposed brick, include test report for efflorescence according to ASTM C 67.
         1) Test reports for face brick must be specific to the specified product. The testing must accurately represent the brick that will be used in the project.
   2 Cementitious materials. Include brand, type, and name of manufacturer.
   3 Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
   4 Grout mixes. Include description of type and proportions of ingredients.

1.07 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
   1 Maintain one copy of each document on project site.

B. Installer Qualifications: Company specializing in performing work of the type specified and employing skilled Trades people with at least 15 years of documented experience.

C. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

D. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

E. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

B. Do not permit metal banding to contact brick.

PART 2 PRODUCTS

2.01 BRICK UNITS

A. Manufacturers: Any new, or replacement brick shall match the existing brick in size, color and texture.

B. Facing Brick: ASTM C216, Type FBS Smooth, Grade SW.
   1 Actual size: To match the original brick excactly and as follows:
   2 Compressive strength: As indicated on drawings, measured in accordance with ASTM C67/C67M.

C. Building (Common) Brick: ASTM C62, Grade SW; solid units.
   1 Compressive strength: As indicated on drawings, measured in accordance with ASTM C67/C67M.

D. Salvaged Brick to be re-used.
   1 See General Notes on Drawiings for Face Brick reclaimed and salvaged from demolition and adequate to be reused on this project.

2.02 MORTAR AND GROUT MATERIALS

A. Mortar Cement : Type N for typical above grade, interior applications, Type S for load bearing and below grade applications
   1 All masonry mortar cement shall be obtained from one of the listed manufacturers
   2 Acceptable Manufacturers:
      a. Cemex
      b. Citadel
      c. Holcim
      d. La Farge
      e. Substitutions: See Section 01 6000 - Product Requirements.

B. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
   1 Not more than 0.60 percent alkali.
   2 Hydrated Lime: ASTM C207, Type S.
   3 Mortar Aggregate: ASTM C144.
   4 Grout Aggregate: ASTM C404.

C. Water: Clean and potable.

D. Packaged Dry Material for Mortar for Unit Masonry is preferred: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C387/C387M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
   1 Type: Type N.
   2 Color: Standard gray or white as required to produce correct color.

2.03 REINFORCEMENT AND ANCHORAGE

A. Residential Wall Ties: Corrugated formed sheet metal, 7/8 inch wide by 0.05 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B, sized to extend at least 1-1/2 inches into the veneer with at least 5/8 inch of mortar coverage from masonry face.

2.04 FLASHINGS (CONCEALED)

A. Provide .040 Elvoloy Kee, non-asphalt, self-adhesive membrane .

B. Approved Manufactuerers:
   1 Advanced Building Products, Inc: Strip-N-Flash® : www.advancedbuildingproducts.com
   2 Hohmann & Barnard, Inc.; Flex-Flash® Flashing
   3 Tremco Roofing: TremPly® KEE Flashing :www.tremco.com

C. Metal Flashing Materials: Prefinished, Galvanized Steel, as specified in Section 07 6200.

D. Flashing Sealant/Adhesives: Silicone, or silyl-terminated polyether/polyurethane or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.

E. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.

2.05 ACCESSORIES

A. Sealant/Adhesives: Silicone, or silyl-terminated polyether/polyurethane providing control Joint and material transition closure.

B. Joint Backer Rod: Closed cell polyurethane; oversized 50 percent to joint width; self expanding; + 1/2 inch of the joint space wide by maximum lengths available.
   1 Manufacturers:
      a. Hohmann & Barnard, Inc: www.h-b.com/sle.
      b. WIRE-BOND: www.wirebond.com/#sle.

C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials. See Section 04 0100.

2.06 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
   1 Exterior, non-loadbearing masonry: Type N.

B. New Mortar for Old Brick: Proportion by volume only; no more than 20 percent of the total volume of Portland cement and lime combined to be Portland cement.
   1 Sand: Match original mortar as closely as possible in color, size, and texture, without use of other additives.
   2 Do not use modern additives unless permitted in writing by Architect.
   3 Repointing Mortar: Use proportions from 1 part lime to 2 parts sand with no Portland cement, up to 2 parts Portland cement to 3 parts lime to 6 parts sand.
   4 White Portland Cement: Use for repointing mortar where Portland cement is permitted.
   5 Use mortar within 30 minutes after final mixing; do not add more water after the initial mix is prepared.

C. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

D. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.

E. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Brick Units:
   1 Bond: Match Existing.
   2 Mortar Joints: Concave / Vee shape tooled, or weathered as shown on drawings.

3.05 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

D. Remove excess mortar and mortar smears as work progresses.

E. Remove excess mortar with water repellent admixture promptly. Do not use acids, sand, other blasting media or high pressure water methods.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Maintain consistent 3/8 inch minimum 7/16 inch maximum width open perimeter at window and door units for full sealant joint.

H. Perform job site cutting of masonry units with powered cutting tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

I. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.06 EFFLORESCENCE PREVENTION / CAVITY PROTECTION

A. All masonry unit cubes (pallets)s shall be stored out of the weather.

B. Mortar shall be proportioned and mixed as specified, mortar shall not be retempered , and shall be discarded for freshly mixed material

C. Top course of unfinished masonry walls shall be covered at the end of each working day to keep debris out of the wall.

3.07 WEEPS

A. Install weeps in veneer and cavity walls at 24 inches on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.

3.08 GROUTED COMPONENTS

A. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

B. Place and consolidate grout fill without displacing reinforcing.

C. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.09 CUTTING AND FITTING

A. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

B. Cutting with trowel, or brick hammer is prohibited. Cutting of masonry units to be performed with properly fitted, powered masonry saw.

3.10 CLEANING

A. Remove excess mortar and mortar droppingsa work progresses.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

3.11 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 05 5000

METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel and aluminum items.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.

B. Section 04 2001 - Masonry Veneer: Placement of metal fabrications in masonry.

C. Section 05 3100 - Steel Decking: Bearing plates for metal deck bearing, including anchorage.

D. Section 05 5213 - Pipe and Tube Railings.

E. Section 09 9000 - Paints & Coatings: Paint finish.

1.03 REFERENCE STANDARDS

A. AA DAF-45 - Designation System for Aluminum Finishes; The Aluminum Association, Inc.; 2003.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2018.

D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.

F. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.

G. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings; 2018, with Editorial Revision.

H. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

I. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

J. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

K. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.

L. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2019.

M. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

N. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

O. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata.

P. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

Q. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1 Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

1.05 QUALITY ASSURANCE

A. Design Steel structural items under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Alabama.

B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.

C. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.

F. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

B. Sheet Aluminum: ASTM B209 (ASTM B209M), 5052 alloy, H32 or H22 temper.

C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210/B210M, 6063 alloy, T6 temper.

D. Aluminum-Alloy Bars: ASTM B211/B211M, 6061 alloy, T6 temper.

E. Aluminum-Alloy Sand Castings: ASTM B26/B26M.

F. Aluminum-Alloy Die Castings: ASTM B85/B85M.

G. Bolts, Nuts, and Washers: Stainless steel.

H. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

2.03 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATED ITEMS

A. Bumper Posts and Guard Rails: As detailed; galvanized finish at exterior installations.

B. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.

C. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of masonry and metal framing members; galvanized finish at exterior applications.

D. Lintels: As detailed; galvanized finish at exterior installations.

2.05 FINISHES - STEEL

A. Prime paint steel items.
   1 Exceptions: Galvanize items to be embedded in concrete or masonry, or exposed to exterior weather conditions.
   2 Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Prime Painting: One coat.

E. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.06 FINISHES - ALUMINUM

A. Exterior Aluminum Surfaces: Class I Color Anodized, or pigmented organic coating as selected by Architect from Manufacturer's full range of available finishes .

B. Interior Aluminum Surfaces: high performance organic coating.
   1 Comply with AA DAF-45 for aluminum finishes required.

C. Exterior Aluminum Surfaces: Class I Color Anodized, or pigmented organic coating as selected by Architect from Manufacturer's full range of available finishes including metallics.

D. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick; dark bronze.

E. Pigmented Organic Coating System: AAMA 2603 polyester or acrylic baked enamel finish; color as indicated.

F. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

2.07 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components as indicated on drawings.

D. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Obtain approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 06 1000

ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural dimension lumber framing.

B. Nonstructural dimension lumber framing.

C. Roof Sheathing.

D. Subflooring.

E. Preservative treated wood materials.

F. Fire retardant treated wood materials.

G. Miscellaneous framing and sheathing.

H. Concealed wood blocking, nailers, and supports.

I. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. Section 03 5400 - SELF LEVELING CEMENT BASED UNDERLAYMENT.

B. Section 06 1753 - Shop-Fabricated Wood Trusses.

C. Section 07 3113 - Asphalt Shngles: Waterproof Underlayment

1.03 REFERENCE STANDARDS

A. APA PRP-108 - Performance Standards and Qualification Policy for Structural-Use Panels (Form E445); 2001.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.

D. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2012, with Editorial Revision (2019).

E. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2019.

F. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.

G. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2017).

H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2020.

I. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; 2015.

J. AWPA C9 - Plywood -- Preservative Treatment by Pressure Processes; American Wood Protection Association; 2003.

K. AWPA C20 - Structural Lumber -- Fire Retardant Treatment by Pressure Processes; American Wood-Protection Association; 2003.

L. AWPA C27 - Plywood -- Fire-Retardant Treatment by Pressure Processes; American Wood-Protection Association; 2002.

M. AWPA U1 - Use Category System: User Specification for Treated Wood; 2018.

N. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

O. PS 1 - Structural Plywood; 2009.

P. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; 2010.

Q. PS 20 - American Softwood Lumber Standard; 2020.

R. SPIB (GR) - Grading Rules; 2014.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials and application instructions.

C. Samples: For rough carpentry members that will be exposed to view, submit two samples, _____by_____ inch in size illustrating wood grain, color, and general appearance.

D. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1 Species: Spruce-Pine-Fir (South), Kiln Dried After Treatment (KDAT) unless otherwise indicated.
   2 If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
   3 Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
   4 Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: Kiln-dry or MC15.

D. Dimensional Lumber: (2 by 2 through 2 by 6):
   1 Species: Southern Pine.
   2 Grade: No. 2.

E. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
   1 Machine stress-rated (MSR) as follows:
      a. Fb-single; minimum extreme fiber stress in bending: 1350 psi.
      b. E; minimum modulus of elasticity: 1,300,000 psi.

F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1 Lumber: S4S, No. 1 or Construction Grade.
   2 Boards: Standard or No. 3.

2.03 EXPOSED BOARDS

A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.

B. Moisture Content: Kiln-dry (15 percent maximum).

C. Surfacing: S4S.

D. Species: Douglas Fir.

E. Grade: No. 2, 2 Common, or Construction.

2.04 CONSTRUCTION PANELS

A. Subfloor/Underlayment Combination: PS 2 type, rated Single Floor.

1 Bond Classification: Exterior.
2 Span Rating: 24.
3 Performance Category: 5/8 PERF CAT.
4 Edges: Square.

B. Roof Sheathing
1 Roof Sheathing : APA Structural I Rated Sheathing, Exterior Exposure Class, and as follows:
a. Span Rating: 24/16.
b. Thickness: 3/4 inch, nominal.
2 Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. GP Georgia Pacific: www.gp.com.
b. LP Louisiana Pacific: www. lp.com
c. Weyerhauser :www.weyerhauser.com

2.05 ACCESSORIES

A. Fasteners and Anchors:
1 Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M , no exceptions permitted.

B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
1 For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.

C. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions.
1 For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.

2.06 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
1 Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
2 KDAT Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
1 Manufacturers:
a. Arch Wood Protection, Inc: www.wolmanizedwood.com.
b. Hoover Treated Wood Products, Inc: www.frtw.com.
c. Osmose, Inc: www.osmose.com.
d. Substitutions: See Section 01 6000 - Product Requirements.
2 Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
b. Treat exposed exterior rough carpentry items, including stairways, balconies, and covered walkways
c. Do not use treated wood in direct contact with the ground.

C. Preservative Treatment:
1 Manufacturers:
a. Arch Wood Protection, Inc: www.wolmanizedwood.com.
b. Viance, LLC: www.treatedwood.com.
c. Substitutions: See Section 01 6000 - Product Requirements.

D. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.

1 Kiln dry lumber after treatment (KDAT) to maximum moisture content of 19 percent.
2 Treat lumber in contact with roofing, flashing, or waterproofing.
3 Treat lumber in contact with masonry or concrete.
4 Treat lumber less than 18 inches above grade.
a. Treat lumber in other locations as indicated.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible, without piecing; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

3.03 INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes, AWC (WFCM) Wood Frame Construction Manual, and _____.

E. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.

F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

G. Provide bridging at joists in excess of 8 feet span as detailed. Fit solid blocking at ends of members.

3.04 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required for support and backup.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to authorities having jurisdiction may be used in lieu of solid wood blocking.

C. In walls, provide blocking securely attached to existing substrates as backing and support for windows and doors.

D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

E. In addition, specifically, provide the following non-structural framing and blocking:
1 Cabinets and shelf supports.
2 Wall brackets.
3 Handrails.
4 Grab bars.
5 Towel and bath accessories.
6 Wall-mounted door stops.

3.05 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at each roof opening except where prefabricated curbs are specified and where specifically indicated otherwise; form corners by alternating lapping side members.

3.06 INSTALLATION OF CONSTRUCTION PANELS

A. Subflooring/Underlayment Combination: Glue and nail to framing; staples are not permitted.

B. Subflooring: Glue and nail to framing; staples are not permitted.

C. Underlayment: Secure to subflooring with nails and glue.
   1 Place building felt between floor underlayment and subflooring.

D. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
   1 Screw panels to framing.

E. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.

F. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
   1 At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2 Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3 Install adjacent boards without gaps.
   4 Size and Location: As indicated on drawings.

3.07 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

B. Allow preservative to dry prior to erecting members.

3.08 TOLERANCES

A. Framing Members: 1/8 inch from true position, maximum.

B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

C. Variation from Plane : 3/16 inch in 10 feet maximum, and 3/8 inch in 30 feet maximum.

3.09 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

3.10 CLEANING

A. Waste Disposal: See Section 01 7419 - Construction Waste Management and Disposal.

B. Comply with Owner's applicable regulations.
   1 Do not burn scrap on project site.
   2 Do not burn scraps that have been pressure treated.
   3 Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.

C. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

D. Prevent sawdust and wood shavings from entering the storm drainage system.

3.11 SCHEDULES (COORDINATE WITH THE DRAWINGS IN THE FIELD

END OF SECTION

SECTION 06 2000

FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Wood casings and moldings.

C. Standing and Running Trim

D. Hardware and attachment accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 06 4100 - Architectural Wood Casework: Shop fabricated custom cabinet work.

C. Section 08 1416 - Flush Wood Doors.

D. Section 09 9113 - Exterior Painting: Painting of finish carpentry items.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI A135.4 - American National Standard for Basic Hardboard; 2012.

C. ANSI A135.4 - American National Standard for Basic Hardboard; 2004.

D. ANSI A208.1 - American National Standard for Particleboard; 2016.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2020.

F. AWI (QCP) - Quality Certification Program; Current Edition.

G. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2018).

H. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2017, with Errata (2019).

I. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.

J. AWPA U1 - Use Category System: User Specification for Treated Wood; 2018.

K. BHMA A156.9 - American National Standard for Cabinet Hardware; 2015.

L. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2016.

M. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

N. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; 2015.

O. PS 1 - Structural Plywood; 2009.

P. PS 20 - American Softwood Lumber Standard; 2020.

Q. WDMA I.S. 4 - Industry Specification for Preservative Treatment for Millwork; 2015a.

R. WI (MAN) - Manual of Millwork; Woodwork Institute; 2003.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with installation of associated and adjacent components.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data:

1 Provide data on fire retardant treatment materials and application instructions.

2 Provide instructions for attachment hardware and finish hardware.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
1 Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
2 Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
3 Include certification program label.

D. Samples: Submit two samples of finish plywood, 12 by 12 inches in size illustrating wood grain and specified finish.

E. Samples: Submit two samples of wood handrail 12 inch long.

F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

1.06 QUALITY ASSURANCE

A. Manufacturer qualifications: Company specializing in fabricating the products specified in this section with minimum five10 years of documented experience.
1 Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
2 Accredited participant in the AWI Quality Certification Program prior to the contract award for fabrication, installation and throughout the duration of the project.

B. Quality Standard: Unless otherwise indicated, comply with AWI's Architectural Woodwork Quality Standards* Architectural Woodwork Standards (Edition 2) for indicated grades of interior architectural woodwork, construction, finishes and other requirements.

C. Provide AWI Quality Certification indicating that the woodwork, including installation, complies with requirements of grades specified. For this project, the Contractor, upon award of work of this Section, shall perform the work under this section with the AWI Quality Certification Program (855-345-0991) including documentation as outlined below.
1 Provide labels or certificates indicating that the installed work complies with 1 or 1 requirements for grade or grades specified.
2 Provide designated labels on shop drawings as required by certification program.
3 Provide designated labels on installed products as required by certification program.
4 Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
5 Replace, repair, or rework all work for which certification is refused.

1.07 MANUFACTURERS / FABRICATORS

A. Southern Woodsmith Inc. :www.southernwoodsmith.com.
1 Luttrell Architectural Woodworks, Inc.:www.luttrellwoodworks.com
2 Fabrication Specialists, Inc..:www.fabricationspecialists.com.
3 Malone Design / Fabricatioon: www.thinkmalone.com.
4 Remmert & Company Architectural Millwork: www.remmertcompany.com.
5 Other local or Regional fabricator subject to compliance with criteria and approval of Architect and Owner.

B. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
1 Company with at least one project within the past 5 years with value of woodwork within 20 percent of cost of woodwork for this project.
2 Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
3 Single Source Responsibility: Provide and install this work from single fabricator.

C. Quality Certification:
1 Provide labels or certificates indicating that work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
2 Provide designated labels on shop drawings as required by certification program.
3 Provide designated labels on installed products as required by certification program.

4 Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

D. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum ten years of documented experience.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

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

B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.

C. Interior Woodwork Items:

1 Loose Shelving: Other than residential living units, or as otherwise specified3/4" Birch plywood; prepare for paint finish. Use Heavy Duty brackets and supports not to exceed 36" o.c.

2.02 LUMBER MATERIALS

A. Softwood Lumber: indicated species, plain sawn, maximum moisture content of 6 percent; with vertical grain.

B. Hardwood Lumber: As indicated species, plain sawn, maximum moisture content of 6 percent , of quality suitable for transparent finish.

2.03 SHEET MATERIALS

A. Softwood Plywood, Not Exposed to View: Any face species, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.

B. Hardboard: ANSI A135.4; Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch thick, smooth one side (S1S).

C. Pegboard: Pressed wood fiber with resin binder, standard grade; 1/8 inch thick, with holes spaced at 1 inch on center in both directions.

2.04 PLASTIC LAMINATE MATERIALS AND ACCESSORIES

A. Plastic Laminate: 1, HGS; color as selected by Architect; textured, low gloss finish.

B. Laminate Backing Sheet: NEMA LD 3, BKL; undecorated plastic laminate.

C. Laminate Adhesive: Type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

D. Adhesive: Type recommended by laminate manufacturer to suit application .

2.05 FASTENINGS

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

B. Fasteners: Of size and type to suit application; uncoated finish in concealed locations and stainless steel finish in exposed locations.

C. Concealed Joint Fasteners: Threaded steel.

2.06 ACCESSORIES

A. Lumber for Shimming and Blocking: Softwood lumber of SPF species.

B. Safety Glass: Laminated glass complying with 16 CFR 1201 and ANSI Z97.1; clear; nominally 6 mm thick.

C. Primer: Alkyd primer sealer.

D. Wood Filler: Oil base, tinted to match surface finish color.

2.07 HARDWARE

A. Hardware: Comply with BHMA A156.9.

2.08 WOOD TREATMENT

A. Factory-Treated Lumber: Comply with requirements of AWPA U1 - Use Category System for pressure impregnated wood treatments determined by use categories, expected service conditions, and specific applications.

B. Fire Retardant Treatment (FR-S Type): Chemically treated and pressure impregnated; capable of providing flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.

C. Water Repellent Preservative Treatment by Dipping Method: WDMA I.S. 4, with 0.25 percent retainage.

D. Shop pressure treat wood materials requiring fire rating to concealed wood blocking.

E. Provide identification on fire retardant treated material.

F. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

G. Redry wood after pressure treatment to maximum 6 percent moisture content.

2.09 FABRICATION

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

B. Fit exposed sheet and veneered material edges with 3/8 inch matching hardwood edging. Use one piece for full length only.

C. Cap exposed plastic laminate finish edges with material of same finish and pattern.

D. Shop prepare and identify components for book match grain matching during site erection.

E. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

F. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

G. Apply laminate backing sheet to reverse face of plastic laminate finished surfaces.

2.10 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. Apply wood filler in exposed nail and screw insets.

C. Resand, if necessary, reapply wood filler and sand until surface is smooth and will not "telegraph" fastener heads through final finish.

D. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

E. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:

1 Transparent:
   a. System best suited for application and expected performance.
   b. Stain: As selected by Architect.
   c. Sheen: Satin.

2 Opaque:
   a. System best suited for specified application and expected performance.
   b. Color: As selected by Architect.
   c. Sheen: Satin.

F. Back prime woodwork items to be field finished, prior to installation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION

A. Set and secure materials and components in place, plumb and level.

B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

C. Install trim and mouldings with brads or nails evenly spaced at not more than six inches on center .

D. Install prefinished paneling with full bed contact adhesive applied to substrate.

E. Install hardware in accordance with manufacturer's written instructions.

3.03 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment in accordance with manufacturer's instructions.

B. Brush apply one coats of preservative treatment on wood in contact with cementitious materials. Treat site-sawn cuts.

C. Allow preservative to dry prior to erecting members.

3.04 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

3.05 SCHEDULE SEE DRAWINGS

A. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; prepare for paint finish.

B. Loose Shelving: Birch plywood; prepare for paint finish.

C. Handrails throughout Lobby and Atrium: Red Oak; transparent stain finish.

END OF SECTION

SECTION 07 0150.19

PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal of existing roofing system in preparation for a new roof covering assembly.

B. Temporary roofing protection.

C. Removal and Salvage to Owner of slate roofing shingles.

1.02 RELATED REQUIREMENTS

A. Section 01 2100 - Allowances: Material Salvage and Replacement

B. Section 06100 - Rough Carpentry: Deck Substrate.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 01 2100 - Allowances, for cash allowances affecting this section.

B. See Section 01 2200 - Unit Prices, for additional unit price requirements.

C. Repair / Replace Existing deteriorated Roof Decking :

1 Basis of Payment: Includes repairing existing deck surface and covering with sheet metal.

1.04 REFERENCE STANDARDS

A. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2012, with Editorial Revision (2019).

B. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with affected mechanical and electrical work associated with roof penetrations.

B. Preinstallation Meeting: Convene one week before starting work of this section.

1 Attendees:

C. Schedule work to coincide with commencement of installation of new roofing system.

1.06 QUALITY ASSURANCE

A. Materials Removal Firm Qualifications: Company specializing in performing the work of this section and metal roof panel replacement with minimum 7 years of documented experience.

1.07 FIELD CONDITIONS

A. Do not remove existing roof coverings when weather conditions threaten the integrity of the building contents or intended continued occupancy.

B. Maintain continuous temporary protection prior to and during installation of new roofing system.

PART 2 PRODUCTS

2.01 COMPONENTS

A. Refer to following sections for additional information on components relating to this work:

2.02 MATERIALS

A. Temporary Roofing Protection Materials:

B. Fiber Insulation Board: ASTM C208, Type II, Grade 1 cellulosic fiber insulating board, with natural surface finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing roof surface has been cleared of materials being removed from existing roofing system and ready for next phase of work as required.

3.02 PREPARATION

A. Sweep roof surface clean of loose matter.

B. Remove loose refuse and dispose of properly off-site.

3.03 MATERIAL REMOVAL

A. Remove only existing roofing materials that can be replaced with new materials the same day.

B. Remove deteriorated anddamaged portions of roofing material, perimeter base flashings, flashings around roof protrusions, pitch pans and pockets.

C. Remove damaged insulation and fasteners, cant strips, and blocking.

D. Remove remaining underlay..

3.04 INSTALLATION

3.05 FIELD QUALITY CONTROL

A. Independent agency inspection and testing will be provided under provisions of Section 01 4000.

B. Inspection firm will identify the exact limits to material removal.

C. Testing will identify the condition of existing materials and their reuse, repair or removal.

3.06 PROTECTION

A. Provide temporary protective sheeting over uncovered deck surfaces.

B. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights.

C. Provide for surface drainage from sheeting to existing drainage facilities.

D. Do not permit traffic over unprotected or repaired deck surface.

3.07 SCHEDULES

A. Entire Roofing Area: Remove existing roofing gravel, perimeter flashings, base flashings, counter flashings, vent stack flashings, roofing membrane, insulation, vapor retarder, and _____.

B. Remove roof mounted mechanical equipment, electrical equipment, and _____.

END OF SECTION

SECTION 07 1800

TRAFFIC COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Coatings Schedule Existing pedestrian.
   1 TC - 2: Traffic Coating Scheduled for Pedestrian Surfaces, exterior covered.

1.02 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016.

B. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2017).

C. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser; 2019.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2020.

E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

F. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2019, with Editorial Revision (2020).

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Include product characteristics and limitations. Identify dissolving solvents, fuels, and potential destructive compounds.

C. Samples: Submit two composite samples of cured membrane and substrate, 12 x 12 inch in size, illustrating color, surface texture, and variations.

D. Manufacturer's Installation Instructions: Include special field conditions required to install traffic membrane and potential incompatibilities with adjacent materials.

E. Maintenance Data: Include procedures for stain removal, repairing surface, and cleaning.

F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than 5 years of documented experience.

B. Applicator Qualifications: Company specializing in performing installation of traffic membrane, with minimum 3 years documented experience and approved by manufacturer.

1.05 MOCK-UPS

A. Provide in place mock-up, 10 feet long by 10 feet wide, with membrane system applied to representative substrate.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Maintain storage area at minimum ambient temperature of 55 degrees F.

B. Keep away from fire or open flame.

1.07 FIELD CONDITIONS

A. Do not install materials when temperature is below 50 degrees F or above 90 degrees F.

B. Maintain this temperature range, 24 hours before, during and 72 hours after application.

C. Restrict traffic from area where materials are being installed or are curing.

1.08 WARRANTY

A. See Section 01 7800 - Project Closeout for additional warranty requirements.

B. Correct defective Work within a 7 year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty for against material failure due to manufacturing, or installation..

1 Include coverage for delamination of system from substrate.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 TRAFFIC COATINGS

A. Pedestrian Polyurethane Waterproof Coating System: Fluid applied polyurethane system with base and top coat.

1 Finished Coating Thickness: 48 mils, 0.048 inch, minimum.

2 Color: Gray.

3 Manufacturers:

a. Master Builders Solutions; MasterSeal Traffic 1500: www.master-builders-solutions.com/en-us/#sle.

b. Polycoat Products; Polydeck 150/150SC: www.polycoatusa.com/#sle.

c. Tremco Commercial Sealants & Waterproofing; Vulkem 350NF/351: www.tremcosealants.com/#sle.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate is ready to receive work, surface is clean, dry and free of substances that could adversely effect bond.

B. Do not begin work until concrete substrate has cured at least 28 days and moisture content is 16 percent or less.

C. Test concrete surfaces according to ASTM F710 for acceptable level of alkalinity.

3.02 PREPARATION

A. Clean substrate surface free of foreign matter.

B. Patch concrete substrate with filler to produce surface conducive to bond.

C. Install cant strips securely at intersecting surfaces.

D. Protect adjacent surfaces.

3.03 INSTALLATION

A. Apply system materials in accordance with manufacturer's instructions.

B. Apply surfacing to top coat before set.

C. Apply sealant to junction of horizontal and intersecting surfaces to achieve watertight seal.

3.04 PROTECTION

A. Do not permit traffic over unprotected surfaces.

B. Protect installation until Substantial Completion.

3.05 SCHEDULES SEE DRAWINGS

END OF SECTION

SECTION 07 2100

THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Batt insulation in exterior wall, ceiling, and roof construction.

B. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

C. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies: Installation of acoustic batt insulation.

B. Section 06 1000 - Rough Carpentry: Coordination of batt and blanket insulation installed in wood framed walls, ceilings and roofs.

1.03 REFERENCE STANDARDS

A. ASTM C240 - Standard Test Methods for Testing Cellular Glass Insulation Block; 2019.

B. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation; 2017, with Editorial Revision (2018).

C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2019.

D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).

E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.

F. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2019.

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2020.

H. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

I. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C; 2019a.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on product characteristics and performance criteria.

C. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection required by ABAA QAP.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

F. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

G. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of contractor accreditation and installer certification on project site during and after installation. Present on-site documentation upon request.

1.05 FIELD CONDITIONS

A. Do not install insulation when construction progress, or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Insulation: Batt and Blanket material
   1 CertainTeed.
   2 Owens Corning Building Solutions
   3 Johns Manville

4 Knauf EcoBatt®

2.02 APPLICATIONS

A. Insulation in Wood Framed Walls: Batt insulation with integral vapor retarder.

B. Insulation in Wood Framed Ceiling Structure: Batt, or blanket insulation with integral vapor retarder.

2.03 BATT INSULATION MATERIALS

A. Where batt insulation is indicated, either glass fiber or mineral fiber batt insulation may be used, at Contractor's option.

B. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.

C. Batt Insulation: ASTM C 665; preformed batt; conforming to the following:
1 Material: Mineral wool, or glass fiber.
2 Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
3 Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
4 Combustibility: Non-combustible, when tested in accordance with ASTM E136.
5 Formaldehyde Content: Zero.
6 Thermal Resistance: R -19 at wall cavities; R-30 at roof
7 Thickness: Full thickness in cavity space.
8 Facing: (single) kraft paper at exterior and interior wood stud walls.
9 Facing: (single) Kraft Paper above wood framed ceilings and attic floors.
10 Products:
a. CertainTeed Corporation; Fiberglass Building Insulation: www.certainteed.com.
b. Johns Manville; JM Formaldehyde-free®: www.jm.com.
c. Knauf Insulation EcoBatt®
d. Owens Corning Corporation; EcoTouch® Flame Spread 25 Batt Insulation, unfaced, : www.ocbuildingspec.com/sle.
e. Thermafiber, Inc: www.thermafiber.com.
11 Substitutions: See Section 01 6000 - Product Requirements.

D. Mineral Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; mechanically fastened; unfaced flame spread index of 25 or less when tested in accordance with ASTM E84.
1 Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
2 Products:
a. Johns Manville; MinWool Sound Attenuation Fire Batts: www.jm.com/#sle.
b. Knauf Insulation; EcoBatt Insulation: www.knaufinsulation.com/#sle.
c. ROCKWOOL (ROXUL, Inc); COMFORTBATT: www.rockwool.com/#sle.
d. Thermafiber, Inc; SAFB FF: www.thermafiber.com/#sle.
e. Substitutions: See Section 01 6000 - Product Requirements.

2.04 ACCESSORIES

A. Insulation Fasteners: Impaling clip of galvanized steel with washer retainer, to be adhered and mechanically fastened to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place. Basis of Design at Continuous for Rigid EXP Insulation
1 Products : Thermal-Grip® Impaling Fastener manufactured by Rodenhouse Fastening Systems :www.rodenhouse-inc.com

B. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer, to be adhered to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place. Basis of Design for unfaced batt insulation:
1 Products : Impaling clip of unfinished steel with self locking retainer cap manufactured by Midwest Fasteners Inc. :www.rodenhouse-inc.com

C. Substitutions: See Section 01 6000 - Product Requirements.

D. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application.

E. Wire Mesh: Galvanized steel, hexagonal wire mesh.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT EXTERIOR CAVITY WALLS

3.03 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Install in exterior wall, roof, and ceiling spaces where indicated without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. Install with factory-applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.

F. Staple facing tabs in place at maximum 6 inches6 inches on center.

G. Optional Method: Retain insulation batts in place with spindle fasteners at 12 inches12 inches on center.

H. Tape seal butt ends, lapped tabs, and tears or cuts in membrane.

I. At wood framing, place vapor retarder on warm side of insulation by stapling at 6 inches on center. Lap and seal sheet retarder joints over face of member.

J. Tape seal tears or cuts in vapor retarder.

K. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane; tape seal in place.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

3.05 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 3113

ASPHALT SHINGLE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Asphalt shingle roofing.

B. Flexible sheet membranes for eave protection, underlayment, valley protection, and Rake protection.

C. Associated metal flashings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 6200 - Sheet Metal Flashing and Trim: Gutters and Downspouts; Edge and cap flashings.

B. Section 07 7123 - Manufactured Gutters and Downspouts.

1.03 REFERENCE STANDARDS

A. ASTM D225 - Standard Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules; 2007.

B. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017.

C. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2019.

D. ASTM D3161/D3161M - Standard Test Method for Wind-Resistance of Steep Slope Roofing Products (Fan-Induced Method); 2020.

E. ASTM D3462/D3462M - Standard Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules; 2019.

F. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2018).

G. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2018).

H. ASTM D4869/D4869M - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing; 2016a.

I. ASTM D6380/D6380M - Standard Specification for Asphalt Roll Roofing (Organic Felt); 2003 (Reapproved 2018).

J. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2020a.

K. NRCA (RM) - The NRCA Roofing Manual; 2019.

L. NRCA MS104 - The NRCA Steep Roofing Manual; National Roofing Contractors Association; 2001, Fifth Edition.

M. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

N. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on synthetic slate roofing, including material characteristics, application limitations, and recommendations for installation.

C. Shop Drawings: Keyed and annotated roof plan identifying roof material layout including metal flashings, gutters and downspouts. Indicate specially configured metal flashings, jointing methods and locations, fastening methods and locations, and installation details at eave, rake, step flashing ,saddle flashing, apron flashing, intersection of adjoining roofs and any other project condition. .

1 Locate expansion provision locations in gutter system, eave, rake and valley flashings along with section details of installation and demonstratying constructability.

D. Samples: Submit a single large sample board showing samples of each shingle color indicating color range and finish texture/pattern; for color selection.

E. Manufacturer's Installation Instructions: Indicate installation criteria and procedures.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1 See Section 01 6000 - Product Requirements, for additional provisions.
   2 Extra Shingles: 100 sq ft (1 Square) of each type and color.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating material characteristics.

C. Shop Drawings: Keyed and annotated roof plan identifying roof material layout including metal flashings, gutters and downspouts. Indicate specially configured metal flashings, jointing methods and locations, fastening methods and locations, and installation details at eave, rake, step flashing ,saddle flashing, apron flashing, intersection of adjoining roofs and any other project condition. .
   1 Locate expansion provision locations in gutter system, eave, rake and valley flashings along with section details of installation and demonstratying constructability.

D. Samples: Submit a single large sample board showing samples of each shingle color indicating color range and finish texture/pattern; for color selection.

E. Manufacturer's Installation Instructions: Indicate installation criteria and procedures.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.06 QUALITY ASSURANCE

A. Products are Required to Comply with Fire Resistance Criteria: UL (DIR) listed and labeled.

1.07 WARRANTY

A. Reference Document 00 6330 - General Contractor's Roofing Guarantee (ABC Form C-9) for additional warranty requirements.

B. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

C. Basic Warranty:
   1 30 year shingle warranty without proration until year 21.
   2 15 year non prorated wind speed warranty up to 90 mph as defined by the 3 second gust listed as outlined in ASCE 7.
   3 Warranty shall include labor and material for leak repair as a result of manufacturing defects.
   4 Manufacturer shall be notified in writing within 30 days of a perceived warranty defect.
   5 Roofing system installer shall provide 5 year, edge to edge, NDL watertightness workmandship warranty as per the requirements of the State Building Commission.
      a. State Building Commission Requirements:
      b. The General Contractor's and Roof System Manufacturer / Installer warranties are Amended and where appropriate, Superceded by the Provisions of ABC Form C-9 "General Contractor's Roofing Guarantee".

D. Any and all references to a State's governing of the terms of the Gurantee, or Warranty, other than the State of Alabama shall be excluded from the document(s) and shall substitute in its place a requirement that the laws of the State of Alabama shall govern all such guarantees and warrantees associated with the roofing system.
   1 Roof system under the Roofing Gurantee is described as: "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."

E. System Warranty: Provide manufacturer's system warranty as described in sub paragraph b. above, agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes and as follows:.
   1 Wind up to 90 mph, based on 3 second gust as defined by ASCE-7
   2 Warranty Term: 20 years.

a. For repair and replacement include costs of both material and labor in warranty.

F. Exceptions :
1 Damage due to roof traffic.
2 Damage due to wind of speed less than the warranted 90 mph up to 90 mph.

1.08 MOCK-UP

A. Provide mock-up of 100 sq ft, including underlayment, eave protection membrane, and associated flashings.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.09 FIELD CONDITIONS

A. Do not install shingles or eave protection membrane when surface temperatures are below 45 degrees F.

1.10 EXTRA MATERIALS

A. See Section 01 6000 - Product Requirements, for additional provisions.

B. Provide 300 sq ft of extra shingles of the selected color.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers:Basis of Design
1 GAF; Timberline® UHDSeries: www.gaf.com/sle.

B. Other Acceptable Manufacturers
1 CertainTeed Landmark® Series: www.certainteed.com
2 Owens Corning Corp; Duration Series: www.owenscorning.com.
3 TAMKO Heritage® Series Laminated Asphalt Shingles
4 Substitutions: See Section 01 6000 - Product Requirements.

C. Algae Resistant Asphalt Shingles:

2.02 ASPHALT SHINGLES

A. Asphalt Shingles: Asphalt-coated glass felt, mineral granule surfaced, complying with ASTM D3462/D3462M.
1 Fire Resistance: Class A, complying with ASTM E108.
2 Wind Resistance: Class A, when tested in accordance with 1.
3 Warranted Wind Speed: 90 mph.
4 Algae Resistant.
5 Weight: 320 lb/100 sq ft.
6 Self-sealing type.
7 Style: Laminated overlay, sawtooth.
8 Color: As selected.

2.03 SHEET MATERIALS

A. Water shedding underlayment: Synthetic mechanically fastened, non-asphaltic sheet, intended by manufacturer for mechanically fastened roofing ASTM D 1970; 10 25 mil, or greater minimum total thickness; and smooth, walkable or granule coated top surface.

B. Eave, rake and Valley Protection Membrane: Self adhering sheet, complying with 1, Class S, Type IV, 39.8 lb/100 sq ft.
1 Manufacturers: Basis of Design
a. GAF®WeatherWatch® Leak Barrier .
2 Other Acceptable Manufacturers.
a. GCP Applied Technologies Inc. Tri-Flex® XT
b. Owens Corning®WeatherLock® G Granulated Self-Sealing Waterproofing Barrier.
3 Substitutions: See Section 01 6000 - Product Requirements.

C. Flexible Flashing: High Temperature (260 degrees F) Self-adhering Proprietary polymer-modified asphalt sheet complying with 1; 40 mil total thickness; with strippable treated release paper and smooth top surface.
   1 Manufacturers: Basis of Design
      a. GCP Technologies Ice & Water Shield® HT{GCP Technologies Ice & Water Shield® HT}.

2.04 ROOF SHEATHING

A. Roof Sheathing for installation where indicated on drawings:: APA Structural I Rated Sheathing, Exterior Exposure Class, and as follows:
   1 Span Rating: 24/0.
   2 Thickness: 3/4 inch, nominal.

B. Composite nail base insulated roof sheathing.
   1 Vented, Plywood surfaced, Polyisocyanurate-Foam Sheathing: Rigid, cellular, polyisocyanurate thermal insulation with 3/4" plywood laminated to one top face complying with ASTM C 1289, Type V. Plywood face has a second layer consisting of oriented strand board adhered to it with spacers between.
   2 Polyisocyanurate-Foam Thickness: 4 inches.
   3 Plywood Thickness: 3/4 inch (20 mm)
   4 Oriented-Strand-Board : Not permitted..
   5 Spacers: Wood furring strips or blocks not less than 3/4 inch (19 mm) thick and spaced not more than 12 inches (300 mm) o.c.

C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1 Basis of Design
      a. HunterPanels Cool-Vent Nailbase Insulated Sheathing: www.hunterpanels.com
   2 Other Acceptable Manufacturers
      a. Atlas Roofing Corporation: www.atalsroofing.com.
      b. Cornell Corporation: www.cornell.com.
      c. Dow Chemical Company (The): www.dow.com.
      d. Johns Manville; Berkshire Hathaway Inc.: www.jm.com
      e. Rmax, Inc. - Vented Nailbase 3: www.rmax.com

2.05 ACCESSORIES

A. Fasteners and Anchors:
   1 3/16"
   2 Shank
   3 Diameter
   4 Inulated Nailbase Sheathing SIP WD Fasteners: Manufacturer's , of G90 hot-dipped zinc coated steel, 10 wire gage, 0.1019 inch shank diameter, 3/8 inch head diameter, of sufficient length to penetrate through roof sheathing or 3/4 inch, or full thickness of roof sheathing or 3/4 inch penetration into solid lumber framing.
   5 Fastener Type and Finish: Stainless steel for high humidity and preservative-treated wood locations,

B. Adhesive: Waterproof, air cure type, cartridge dispensed.
   1 LIQUID NAILS® Adhesive Manufactured by PPG Architectural Coatings; PPG Industries; Inc.
   2 TYTAN Subfloor High Yield Adhesive manufactured by SELENA USA, INC: www.selenausa.com

C. Staples: Not permitted.

D. Sealant at weather exposed and semi exposed conditions: Silicone as specified in Section 07 9200 - Joint Sealants

E. Lap Cement: As recommended by manufacturer for use in application of and compatible with underlayment, free of toxic solvents, applied at the limits of the weather laps and not to be exposed..

F. Plastic Cement: 1, asphalt roof cement (concealed locations only).

G. Ridge Vents: Plastic, extruded with vent openings that do not permit direct water or weather entry; flanged to receive shingles.
   1 Provide Shingle manufacturer's matching ridge vent accessory as part of a complete roof system.

2.06 ACCESSORIES

A. Nails: Standard round wire shingle type, of G90 hot-dipped zinc coated steel, 10 wire gage, 0.1019 inch shank diameter, 3/8 inch head diameter, of sufficient length to penetrate through roof sheathing or minimum 3/4 inch into board roof decking.

B. Lap Cement: As recommended by manufacturer for use in application of and compatible with underlayment, free of toxic solvents, applied at the limits of the weather laps and not to be exposed..

C. Ridge Vents: Plastic, extruded with vent openings that do not permit direct water or weather entry; flanged to receive shingles.
   1 Provide Shingle manufacturer's matching ridge vent accessory as part of a complete roof system.

2.07 METAL FLASHINGS

A. Metal Flashings: Provide copper sheet metal eave edge, open valley flashing, dormer flashing, Gable Rakes, and other flashing indicated.
   1 Form flashings to profiles indicated on Drawings and to protect roofing sub materials from physical damage and to shed water.
   2 Form flashings to protect roofing materials from physical damage and shed water.
   3 Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.
   4 Hem exposed edges of flashings minimum 1/4 inch on underside.
   5 Coat concealed surfaces of flashings with waterproof mastic.

B. Sheet Metal: 16 oz. Natural Finish, Copper, as specified in Section 07 6200.

C. Bituminous Paint: Acid and alkali resistant type; black color for concealed applications only..

WOOD TREATMENT

3.01 FIRE RETARDANT TREATMENT:

A. Manufacturers:
   1 Hoover Treated Wood Products, Inc : www.frtw.com.
   2 Osmose, Inc : www.osmose.com.
   3 Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

4.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

B. Verify that decking material is of specified thickness to accept shingle fasteners and is installed and fastened adequately as required by shingle manufacurer to provide specified warrant..

C. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.

D. Verify roof openings are correctly framed.

4.02 PREPARATION

A. Seal roof deck joints wider than 1/16 inch as recommended by shingle manufacturer.

B. At areas where eave protection membrane is to be adhered to substrate, fill knot holes and surface cracks with latex filler.

C. Broom clean deck surfaces before installing underlayment or eave protection.

D. Install eave edge flashings tight and true with line of fascia boards and cornice edge. Weather lap joints 2 inches and seal with plastic cement. Secure flange in full bed of construction adhesive, or silicone with nails spaced 12 inches on center.

4.03 INSTALLATION - EAVE PROTECTION MEMBRANE

A. Install eave protection membrane over nail base insulated sheathing from eave edge to minimum 3 ft up-slope beyond interior face of exterior wall.

B. Install eave protection membrane in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

4.04 INSTALLATION - UNDERLAYMENT

A. Underlayment: Install underlayment perpendicular to slope of roof, with ends and edges weather lapped minimum 6 inches. Stagger end laps of each consecutive layer. Nail in place. Weather lap minimum 4 inches over eave protection.

B. Weather lap and seal watertight with plastic cement any items projecting through or mounted on roof.

4.05 INSTALLATION - VALLEY PROTECTION

A. Install valley protection in accordance with 1, and as shown on drawings.

B. Install 36 inch wide flexible flashing layer centered in the valley in accordance with manufacturer's instructions and 1 applicable requirements.

C. Install one layer of copper sheet flashing, minimum 24 inches wide, center crimped , centered over open valley and crimped to guide water. Weather lap joints minimum 4 inches wide band of lap cement along each edge of first, press roll roofing into cement, and nail in place minimum 18 inches on center, 1 inch from edges.

4.06 INSTALLATION - METAL FLASHING AND ACCESSORIES

A. Install flashings in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

B. Weather lap joints minimum 2 inches and seal weather tight with plastic cement.

C. Secure in place with nails at _____ inches on center, and conceal fastenings.

D. Items Projecting Through or Mounted on Roofing: Flash and seal weather tight with plastic cement.

4.07 INSTALLATION - SHINGLES

A. Install shingles in accordance with manufacturer's instructions by hand nailing only - Pneumatic nailing is not permitted..
   1 Install starter course strips at eaves and rakes
   2 Fasten strip shingles using 6 nails per strip, or as required by code, whichever is greater.

B. Place shingles in straight coursing pattern with 5 inch weather exposure to produce double thickness over full roof area. Provide double course of shingles, or premanufactured "starter course" at eaves and rakes.

C. Project starter course of shingles 3/4 inch beyond fascia boards.

D. Extend shingles 1/2 inch beyond face of rake edge fascia boards.

E. Extend shingles on one slope across valley and fasten, trim shingles from other slope 2 inches from valley center line to achieve closed cut valley, and concealing valley protection.

F. Extend shingles on both slopes across valley in a weave pattern and fasten, extend shingles a minimum of 12 inches beyond valley center line to achieve woven valley, and concealing valley protection.

G. Cap hips with individual shingles, maintaining 5-inch weather exposure, and place to avoid exposed nails.

H. After installation, place one daub of plastic cement, 1-inch diameter under each individual shingle tab exposed to weather, to prevent lifting.

I. Coordinate installation of roof mounted components or work projecting through roof includiing lightning protection system components.with weather tight placement of suitable stainless steel, or copper counterflashings.

J. Complete installation to provide weather tight service.

4.08 PROTECTION

A. Do not permit traffic over finished roof surface.

END OF SECTION

SECTION 07 7123

MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Factory finished, aluminum Site fabricated, gutters and downspouts.

B. Installation accessories and Supports.

C. Molded Fiberglass Splash blocks

1.02 RELATED REQUIREMENTS

A. Section 07 3113 - Asphalt Shingle Roofing: Sloped roofing system.

B. Section 07411 - Preformed Metal Roof Panels.

C. Section 07 6200 - Sheet Metal Flashing and Trim.

D. Section 09 9113 - Exterior Painting: Field painting of metal surfaces.

1.03 REFERENCE STANDARDS

A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.

D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

E. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).

F. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

G. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

H. ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free; 2007 (Reapproved 2018).

I. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Conform to SMACNA (ASMM) for sizing components for rainfall intensity determined by a storm occurrence of 1 in 10 years.

B. Comply with applicable code for size and method of rain water discharge.

C. Maintain one copy of each document on site.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on prefabricated components.

C. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.

1 Fabricator / installer to Provide accurate detailing and shall have calculated size and placement of roof drainage components including, gutters, drain outlets, downspouts and conductor heads based on area of roof to be drained according to SMACNA (ASSM) Guidelines for rainfall intensity as referenced above.

D. Samples: Submit two samples, 12x12 inches square illustrating component design, finish, color, and configuration.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store system components and material out of the weather, organized to prevent dents, twisting, bending, or abrasion, of parts and finishes and to provide ventilation. Provide for adequate drainage away to drain.

B. Prevent contact with materials that could cause discoloration, staining, or damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. ALUMINUM FABRICATIONS

1 Gutters: K Style (Ogee) Profile, 6 inch minimum as indicated on drawings.

2 Downspouts: Rectangular profile, to match existing.

3 Gutters and Downspouts: Sized for rainfall intensity determined by a storm occurrence of 1 in 10 years in accordance with SMACNA (ASMM).

4 Gutter Downspouts, and Accessories: Manufacturers.

a. ATAS International, Inc; Water Control: www.atas.com/sle.

b. Rain Trade Corporation; Product www.guttersupply.com

c. Rutland Gutter Supply Incorporated: www.perimeter-systems.com.

d. Substitutions: See Section 01 6000 - Product Requirements.

e. Accessories: Profiled to suit downspouts.

1) Anchorage Devices: In accordance with SMACNA (ASMM) requirements.

2) Gutter Supports: Brackets (Hangers).

3) Downspout Supports: Bracket Stand Offs.

f. Downspout Extenders: Same material and finish as downspouts.

2.02 MATERIALS

A. Pre-Finished Aluminum Sheet: ASTM B209 (ASTM B209M); 0.032 inch thick minimum.

1 Finish: Plain, shop pre-coated with PVDF (polyvinylidene fluoride) coating.

2 Color: As selected from manufacturer's standard colors.

B. Primer: Zinc molybdate type.

C. Solder: ASTM B32; Sn50 (50/50) type.

2.03 COMPONENTS

A. Gutters: Profile as indicated.

B. Gutters: K- Style (Ogee) Profile as indicated on Drawings..

C. Conductor Heads: Profile and size as indicated.

D. Downspouts: SMACNA Rectangular profile.

E. Anchors and Supports: Profiled to suit gutters and downspouts.

1 Anchoring Devices: In accordance with SMACNA requirements.

2 Gutter Supports: Brackets.

3 Downspout Supports: Brackets.

F. Fasteners: Same material and finish as gutters and downspouts, with soft neoprene washers.

2.04 ACCESSORIES

A. Splash Blocks: Molded Fiberglass; size and profiles indicated:

2.05 FABRICATION

A. Form gutters, and downspouts of profiles and size indicated.

B. Fabricate with required connection pieces.

C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.

D. Hem exposed edges of metal.

E. Fabricate gutter and downspout accessories; seal watertight.

2.06 FINISHES

A. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system; color as indicated.

B. Primer Coat: Finish concealed side of metal sheets with primer compatible with finish system, as recommended by finish system manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that surfaces are ready to receive work.

3.02 PREPARATION

A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

A. Install gutters, conductor heads, downspouts, and accessories in accordance with manufacturer's instructions.

B. Sheet Metal: Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts and accessories.

C. Slope gutters 1/8" inch per foot, 12.5 percent minimum.

D. Solder metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

E. Set splash blocks under downspouts.

END OF SECTION

SECTION 07 8400

FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping systems.

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

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 7000 - Execution Requirements: Cutting and patching.

C. Section 07 8100 - Applied Fire Protection.

D. Section 09 2116 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS

A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2020.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).

C. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2015 (Reapproved 2019).

D. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems; 2020a.

E. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers; 2020.

F. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus; 2020.

G. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2013 (Reapproved 2017).

H. ITS (DIR) - Directory of Listed Products; current edition.

I. FM 4991 - Approval Standard for Firestop Contractors; 2013.

J. FM (AG) - FM Approval Guide; current edition.

K. SCAQMD 1168 - Adhesive and Sealant Applications; 1989 (Amended 2017).

L. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

M. UL (DIR) - Online Certifications Directory; Current Edition.

N. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Manufacturer's qualification statement.

G. Installer's qualification statement.

1.05 QUALITY ASSURANCE

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

1 Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
2 Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and:
1 Verification of minimum three years documented experience installing work of this type.
2 Verification of at least five satisfactorily completed projects of comparable size and type.
3 Licensed by local authorities having jurisdiction (AHJ).
4 Approved by firestopping manufacturer.

D. Installing Mechanic's Qualifications: Trained by firestopping manufacturer and able to provide evidence thereof.

1.06 MOCK-UP

A. Install one firestopping assembly representative of each fire rating design required on project.
1 Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.
2 Where firestopping is intended to fill a linear opening, install minimum of 1 linear ft.

B. Obtain approval of authorities having jurisdiction (AHJ) before proceeding.

C. If accepted, mock-up will represent minimum standard for this work.

D. If accepted, mock-up may remain as part of this work. Remove and replace mock-ups not accepted.

1.07 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manufacturers:
1 A/D Fire Protection Systems Inc.: www.adfire.com.
2 3M Fire Protection Products: www.3m.com/firestop.
3 Nelson FireStop Products: www.nelsonfirestop.com.
4 Specified Technologies, Inc.: www.stifirestop.com.
5 NOTE: Contractors and sub-contractors to use same manufacturer's systems for all applicable firestopping.

B. Mold and Mildew Resistance: Provide firestoppping materials with mold and mildew resistance rating of zero(0) in accordance with ASTM G21.

C. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

D. Fire Ratings: Refer to drawings for required systems and ratings.

2.02 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Perimeter Fire Containment Firestopping: Use system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of floor assembly.
1 Movement: Provide systems that have been tested to show movement capability as indicated.
2 Temperature Rise: Provide systems that have been tested to show T Rating as indicated.
3 Air Leakage: Provide systems that have been tested to show L Rating as indicated.
4 Where floor assembly is not required to have a fire rating, provide systems that have been tested to show L Rating as indicated.

B. Head-of-Wall (HW) Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of wall assembly.
   1 Movement: Provide systems that have been tested to show movement capability as indicated.

C. Floor-to-Floor (FF), Floor-to-Wall (FW), Head-of-Wall (HW), and Wall-to-Wall (WW) Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
   1 Movement: Provide systems that have been tested to show movement capability as indicated.
   2 Air Leakage: Provide systems that have been tested to show L Rating as indicated.
   3 Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

D. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
   1 Temperature Rise: Provide systems that have been tested to show T Rating as indicated.
   2 Air Leakage: Provide systems that have been tested to show L Rating as indicated.
   3 Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

2.03 FIRESTOPPING SYSTEMS

A. Firestopping:
   1 Fire Ratings: See drawings for required systems and ratings. Contractors and sub-contractors to use same manufacturer's systems for all applicable firestopping.

B. Firestopping Between Edge of Floor Slab and Curtain Wall (without Penetrations): Fiber firestopping with smoke seal coating;UL Design No. _____, T Rating 1 hour, T Rating 2 hour.

2.04 MATERIALS

A. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant; conforming to the following:
   1 Color: red.
   2 Manufacturers:
      a. Nelson Firestop Products; Product CLK Silicone Sealantwww.nelsonfirestop.com.

B. Fiber Firestopping: Mineral fiber insulation used in conjunction with elastomeric surface sealer forming airtight bond to opening; conforming to the following:
   1 Water Absorption: < 1%
   2 Manufacturers:
      a. Thermafiber; Product Safing Insulation; www.thermafiber.com.

C. Firestop Devices - Wrap Type: Mechanical device with incombustible filler and sheet stainless steel jacket, collar, and / or galvanized steel collar, intended to be installed after penetrating item has been installed; conforming to the following:
   1 Manufacturers:
      a. Nelson Firestop Products; Product PCS Pipe Choke Systemwww.nelsonfirestop.com.

D. Firestop Devices - Cast-In Type: Sleeve and sealing material, intended to be cast in concrete floor forms or in concrete on metal deck, not requiring any additional materials to achieve penetration seal.
   1 Manufacturers: Bsis of Design

E. Intumescent Putty: Compound that expands on exposure to surface heat gain; conforming to the following:
   1 Manufacturers:
      a. Nelson Firestop Products; Product FSP Fire Stop Puttywww.nelsonfirestop.com.

F. Reusable Firestopping: Removable intumescent compressible shapes, pillows, or blocks specifically tested in removable configuration; conforming to the following:
   1 Manufacturers:

a. 3M Fire Protection Products Products Fire Barrier Pillow

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by Owner's Independent Testing Agency.

C. Do not cover installed firestopping until inspected by authorities having jurisdiction.

D. Install labeling required by code.

3.04 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.05 PROTECTION

A. Clean adjacent surfaces of firestopping materials.

B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 07 9200

JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Pressurized Spray Foam Sealant

D. Joint backings and accessories.

E. Owner-provided field quality control.

F. Manufacturer-provided field quality control.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.

B. Section 07 1300 - Sheet Waterproofing: Sealing cracks and joints in waterproofing substrate surfaces using materials specified in this section.

C. Section 07 2500 - Weather Barriers: Sealants required in conjunction with water-resistive barriers.

D. Section 07 8400 - Firestopping: Firestopping sealants.

E. Section 07 9100 - Preformed Joint Seals: Precompressed foam, gaskets, and strip seals.

F. Section 08 7100 - Door Hardware: Setting exterior door thresholds in sealant.

G. Section 08 8000 - Glazing: Glazing sealants and accessories.

H. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.

I. Section 09 2216 - Non-Structural Metal Framing: Sealing between framing and adjacent construction in acoustical and sound-rated walls and ceilings.

J. Section 09 3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

K. Section 23 3100 - HVAC Ducts and Casings: Duct sealants.

1.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015.

B. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2018.

C. ASTM C834 - Standard Specification for Latex Sealants; 2017.

D. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2018.

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

F. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2016.

G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

H. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2018.

I. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2014.

J. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2018.

K. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2019 (Reapproved 2020).

L. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015, with Editorial Revision (2017).

M. SCAQMD 1168 - Adhesive and Sealant Applications; 1989 (Amended 2017).

N. SWRI (VAL) - SWR Institute Validated Products Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.

1 Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.

2 List of backing materials approved for use with the specific product.

3 Substrates that product is known to satisfactorily adhere to and with which it is compatible.

4 Substrates the product should not be used on.

5 Substrates for which use of primer is required.

6 Substrates for which laboratory adhesion and/or compatibility testing is required.

7 Installation instructions, including precautions, limitations, and recommended backing materials and tools.

8 Sample product warranty.

9 Certification by manufacturer indicating that product complies with specification requirements.

10 SWRI Validation: Provide currently available sealant product validations as listed by SWRI (VAL) for specified sealants.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.

D. Shop Drawings for Joint Sealants: Submit project specific details, project specific joint sealant schedule, floor plans, elevations, ceiling plans and details indicating joint sealant types corresponding to the joint sealant schedule. Submit four weeks prior to Installation Plan submittal.

E. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

F. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.

G. Sustainable Design Documentation: For sealants and primers, submit VOC content and emissions documentation; see Section 01 6116.

H. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

I. Installation Plan: Submit at least four weeks prior to start of installation.

J. Preinstallation Field Adhesion Test Plan: Submit at least two weeks prior to start of installation.

K. Field Quality Control Plan: Submit at least two weeks prior to start of installation.

L. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.

M. Installation Log: Submit filled out log for each length or instance of sealant installed.

N. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.

1.05 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

D. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.

1 Adhesion Testing: In accordance with ASTM C794.
2 Compatibility Testing: In accordance with ASTM C1087.
3 Stain Testing: In accordance with ASTM C1248; required only for stone substrates.
4 Allow sufficient time for testing to avoid delaying the work.
5 Deliver to manufacturer sufficient samples for testing.
6 Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
7 Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

E. Installation Plan: Include schedule of sealed joints, including the following.
1 Joint width indicated in Contract Documents.
2 Joint depth indicated in Contract Documents; to face of backing material at centerline of joint.
3 Method to be used to protect adjacent surfaces from sealant droppings and smears, with acknowledgement that some surfaces cannot be cleaned to like-new condition and therefore prevention is imperative.
4 Approximate date of installation, for evaluation of thermal movement influence.

F. Preinstallation Field Adhesion Test Plan: Include destructive field adhesion testing of one sample of each combination of sealant type and substrate, except interior acrylic latex sealants, and include the following for each tested sample.
1 Identification of testing agency.
2 Name(s) of sealant manufacturers' field representatives who will be observing

G. Owner will employ an independent testing agency to perform the field quality control inspection and testing as referenced in PART 3 of this section and as follows, to prepare and submit the field quality control plan and log, and to provide recommendations of remedies in the case of failure.

H. Field Quality Control Plan:
1 Visual inspection of entire length of sealant joints.
2 Non-destructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
a. For each different sealant and substrate combination, allow for one test every 12 inches in the first 10 linear feet of joint and one test every 24 inches thereafter.
b. If any failures occur in the first 10 linear feet, continue testing at 12 inches intervals at no extra cost to Owner.
3 Destructive field adhesion testing of sealant joints, except interior acrylic latex sealant.
a. For each different sealant and substrate combination, allow for one test every 100 feet in the first 1000 linear feet, and one test per 1000 linear feet thereafter, or once per floor on each elevation.
b. If any failures occur in the first 1000 linear feet, continue testing at frequency of one test per 500 linear feet at no extra cost to Owner.
4 Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

I. Field Adhesion Test Procedures:
1 Allow sealants to fully cure as recommended by manufacturer before testing.
2 Have a copy of the test method document available during tests.
3 Take photographs or make video records of each test, with joint identification provided in the photos/videos; for example, provide small erasable whiteboard positioned next to joint.
4 Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
5 When performing destructive tests, also inspect the opened joint for proper installation characteristics recommended by manufacturer, and report any deficiencies.
6 Deliver the samples removed during destructive tests in separate sealed plastic bags, identified with project, location, test date, and test results, to Owner.
7 If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.

J. Non-Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.
   1 Record results on Field Quality Control Log.
   2 Repair failed joints, having a length of 48 inches, or less.
   3 Repair failed portions of joints having increments of 48 inches or more.

K. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.
   1 Sample: At least 18 inches long.
   2 Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch by that percentage; if adhesion failure occurs before the "1 inch mark" is that distance from the substrate, the test has failed.
   3 If either adhesive or cohesive failure occurs prior to minimum elongation, take necessary measures to correct conditions and re-test; record each modification to products or installation procedures.
   4 Record results on Field Quality Control Log.
   5 Repair failed portions of joints in their entirety..

L. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with ASTM C1521, or other applicable method as recommended by manufacturer.

1.06 WARRANTY

A. See Section 01 7800 - Project Closeout for additional warranty requirements.

B. Correct defective work as follows:after the Date of Substantial Completion:
   1 Exterior Sealants: Twenty (20) Years.
   2 Interior Sealants : Seven (10) Years.

C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
   1 BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
   2 Dow Corning® Corporation: www.dowcorning.com/construction.
   3 DOW Corporation
   4 Tremco Global Sealants: www.tremcosealants.com.
   5 Sherwin-Williams Company: www.sherwin-williams.com.

B. Self leveling Sealants: Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.
   1 BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
   2 Dow; _____: www.dow.com/#sle.
   3 Tremco Global Sealants: www.tremcosealants.com.
   4 Sika Corporation: www.usa-sika.com.
   5 Substitutions: See Section 01 6000 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:
   1 Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
      a. Wall expansion and control joints.
      b. Joints between door, window, and other frames and adjacent construction.
      c. Joints between different exposed materials.
      d. Openings below ledge angles in masonry.

e. Other joints indicated below.

2 Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.

a. Joints between door, window, and other frames and adjacent construction including casings and standing and running trim, including base boards..

b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.

c. Other joints indicated below.

3 Do not seal the following types of joints.

a. Intentional weepholes in masonry.

b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.

c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.

d. Joints where installation of sealant is specified in another section.

e. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use nonsag Low Modulus and Ultra Low Modulus Silicone sealant, Type S-1, S-1a, unless otherwise indicated.

C. Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.

1 Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.

2 Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; clear; Type ____.

3 In Sound-Rated Assemblies: Acrylic emulsion latex sealant.

4 Other interior Floor Joints: Self-leveling polyurethane "traffic-grade" sealant; Type _____.

D. Interior Wet Areas: Bathrooms, restrooms, kitchens, food service areas, and food processing areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.

E. Sound-Rated Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", or "acoustical".

F. Areas Where Tamper-Resistance is Required: As indicated on drawings.

2.03 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products with acceptable levels of volatile organic compound (VOC) content; see Section 01 6116.

B. Colors: As Selected from Manufacturer's full range of available options..

2.04 NONSAG JOINT SEALANTS

A. Type S-1 - Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.

1 Applications: General exterior use M: Metal to metal, MA: Masonry control joints, etc.

2 Movement Capability: Plus and minus ____ percent, minimum.

3 Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.

4 Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.

5 Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.

6 Color: As selected by Architect from Manufacturer's full range of available options..

7 Cure Type: _____.

8 Service Temperature Range: Minus 20 to 180 degrees F.

9 Products: Basis of Design.

a. Dow Corning Corporation; 795 Silicone Building Sealant: www.dowcorning.com/construction.

10 Other Acceptable Products:

a. Tremco® Global Sealants and Waterproofing Product Spectrem® 2 high-performance, single-component, neutral-cure, Spectrem® 2 .

b. Pecora® Corporation Product; 864NST Low Modulus Architectural Silicone Sealant - Class 50: www.pecora.com.
c. Sika® Corporation; Sikasil® WS-290: www.usa-sika.com.
1) Substitutions: See Section 01 6000 - Product Requirements.

B. Type S-1a - Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
1 Applications: Exterior use for joints between dissimilar materials such as between metals and masonry, or other locations requiring greater movement capability. (M A,
2 Movement Capability: Plus and minus 50 percent, minimum.
3 Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
4 Color: custom.
5 Cure Type: Single-component, neutral moisture curing
6 Service Temperature Range: Minus 65 to 180 degrees F.
7 Manufacturers:
a. Dow Corning® Corporation; 790 Silicone Building Sealant: www.dowcorning.com/construction.
b. Sika® Corporation; Sikasil® WS-295: www.usa-sika.com.
c. Sika® Corporation; Sikasil 728NS: www.usa-sika.com.
d. Sikasil® WS-295.

C. Type S-1b - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
1 Color: Clear.
2 Manufacturers:
a. Bsais of Design Product: DOW CORNING® 786 SILICONE MILDEW RESISTANT SEALANT manufactured by Dow Corning Corporation: www.dowcorning.com.
b. Substitutions: See Section 01 6000 - Product Requirements.

D. Type (S-1sg) : Structural Glazing Sealant: Product Dow Corning® 121 Structural Glazing Sealant

E. Type 2a - Silyl-Terminated Polyether (STPE) and Polyurethane (STPU) Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
1 Movement Capability: Plus and minus 35 percent, minimum.
2 Manufacturers:
a. Sherwin-Williams Company; Stampede 100 Low-Modulus Hybrid Urethane Sealant: www.sherwin-williams.com/#sle.
b. Sherwin-Williams Company; Stampede 1H Hybrid Sealant: www.sherwin-williams.com/#sle.
c. Pecora Corporation; DynaFlex SC Polyurethane STPU Security Sealant: www.pecora.com.
d. Sika Corporation; SikaHyflex-150 LM: www.usa-sika.com.
e. Substitutions: See Section 01 6000 - Product Requirements.

F. Type S2aa - Tamper-Resistant, Silyl-Terminated Polyether (STPE) and Polyurethane (STPU) Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
1 Movement Capability: Plus and minus ___ percent, minimum
2 Hardness Range: 25 to 30, Shore A, when tested in accordance with ASTM C661.
3 Color: Match adjacent finished surfaces.
4 Service Temperature Range: Minus 40 to 180 degrees F.
5 Products:
a. MasterSeal® NP 100™
b. Pecora Corporation; DynaFlex SC (Security Sealant): www.pecora.com/#sle.
c. Sika Corporation; SikaHyflex-150 LM: www.usa.sika.com/#sle.
d. Substitutions: See Section 01 6000 - Product Requirements.

G. Type S-2 - Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multicomponent; not expected to withstand continuous water immersion or traffic.
1 Movement Capability: Plus and minus _____ percent, minimum.

2 Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
3 Color: Color selected, or paint to Match adjacent finished surfaces.
4 Service Temperature Range: Minus 40 to 180 degrees F.
5 Manufacturers:
a. BASF Corporation Product MasterSeal NP 1: www.master-builders-solutions.basf..com
b. Pecora Corporation; DynaTrol II: www.pecora.com/#sle.
c. Sika Corporation; Sikaflex-1a: www.usa.sika.com/#sle.
d. Tremco Global Sealants Product Dymonic® 100: www.trmco.com

H. Type AC-1 - Acoustical Sealant: Acrylic-Urethane Sealant: Water-based; ASTM C920, Grade NS, Uses M and A; single component; paintable; not expected to withstand continuous water immersion or traffic.
1 Movement Capability: Plus and minus 12-1/2 percent, minimum.
2 Color: White.
3 Service Temperature Range: Minus 40 to 180 degrees F.

I. Basis of Design Product: SHEETROCK® Brand Acoustic Sealant manufactured by United States Gypsum Company: www.usg.com.

J. Other Acceptable Manufacturers:
1 Franklin International, Inc; Titebond UA 920 Sealant: www.titebond.com.
2 Sherwin-Williams Company; Shermax Urethanized Elastomeric Sealant: www.sherwin-williams.com.
3 Substitutions: See Section 01 6000 - Product Requirements.

K. Type ___ - Pressurized Spray Foam Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
1 Movement Capability: Plus and minus 12-1/2 percent, minimum.
2 Color: White.
3 Service Temperature Range: Minus 40 to 180 degrees F.

L. Basis of Design Manufacturer:
1 Dow® Chemical Company Product "Great Stuff®" Insulating Polyurethane Sealant.
2 Franklin International, Inc; Titebond UA 920 Sealant: www.titebond.com/#sle.

2.05 SELF-LEVELING SEALANTS

A. Type TS-1 - Self-Leveling Silicone Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
1 Movement Capability: Plus 100 percent, minus 50 percent, minimum.
2 Hardness Range: 0 to 15, Shore A, when tested in accordance with ASTM C661.
3 Color: Color as selected.
4 Service Temperature Range: Minus 40 to 180 degrees F.
5 Manufacturers:
a. Dow Corning® 890-SL SILICONE JOINT SEALANT
b. Sika Corporation; Sikasil 728SL: www.usa.sika.com/#sle.
c. Substitutions: See Section 01 6000 - Product Requirements.

B. Type TS-2 - Indoor Use Only, Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .
1 Movement Capability: Plus and minus 25 percent, minimum.
2 Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
3 Color: To be selected by Architect from manufacturer's full range.
4 Manufacturers: Basis of Design
a. Master® Builders Solutions Product MasterSeal SL 1® Self-Leveling Sealant: www.basf.com.
5 Other Acceptable Manufacturers
a. Pecora Corporation; ____: www.pecora.com/#sle.

b. Sika Corporation; Sikaflex-1c SL: www.usa.sika.com/#sle.

C. Type TS-3 - Self-Leveling Polyurethane Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade P, Uses M and A; single or multicomponent; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
1 Movement Capability: Plus and minus 25 percent, minimum.
2 Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
3 Color: To be selected by Architect from manufacturer's full range.
4 Service Temperature Range: Minus 40 to 180 degrees F.
5 Manufacturers: Basis of Design
a. Sika Corporation; Sikaflex-2c SL: www.usa.sika.com/#sle.
6 Other Acceptable Manufacturers
a. BASF Master® Builders Solutions; Product SL 2®.
b. Tremco® Commercial Sealants and Waterproofing; ProductDymeric® 240: www.tremcosealants.com.
c. Substitutions: See Section 01 6000 - Product Requirements.

2.06 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
1 Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type C - Closed Cell Polyethylene.
2 Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type C - Closed Cell Polyethylene.
3 Open Cell: 40 to 50 percent larger in diameter than joint width.
4 Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
5 Manufacturers:
a. Industrial Thermo Polymers Limited; Product TUNDRA® FOAM : www.tundrafoam.com
b. Bay Companies Inc. Product Mile High Foam® open cell backer rod: www.bayindustries.com
c. C.R. Laurence Co., Inc. Product CRL Open Cell Backer Rod: http://www.crlaurence.com/.
d. Substitutions: See Section 01 6000 - Product Requirements.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

D. Preinstallation Adhesion Testing: Install a sample for each test location indicated in the test plan.
1 Test each sample as specified in PART 1 under QUALITY ASSURANCE article.
2 Notify Architect of date and time that tests will be performed, at least seven days in advance.
3 Arrange for sealant manufacturer's technical representative to be present during tests.
4 Record each test on Preinstallation Adhesion Test Log as indicated.
5 If any sample fails, review products and installation procedures, consult manufacturer, or take whatever other measures are necessary to ensure adhesion; re-test in a different location; if unable to obtain satisfactory adhesion, report to Architect.
6 After completion of tests, remove remaining sample material and prepare joint for new sealant installation.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

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

B. Perform installation in accordance with ASTM C1193.

C. Perform acoustical sealant application work in accordance with ASTM C919.

D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

E. Install bond breaker backing tape where backer rod cannot be used.

F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

I. Concrete Floor Joint Filler: Tool flush prior to full cure,

3.04 FIELD QUALITY CONTROL

A. Owner will employ an independent testing agency to perform field quality control inspection and testing as specified in PART 1 under QUALITY ASSURANCE article.

B. Non-Destructive Adhesion Testing: If there are any failures in first 100 linear feet, notify Architect immediately.

C. Destructive Adhesion Testing: If there are any failures in first 1000 linear feet, notify Architect immediately.

D. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

E. Repair destructive test location damage immediately after evaluation and recording of results.

3.05 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

END OF SECTION

SECTION 07 9200

JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes sealants for the following:
   1 Interior joints in vertical surfaces and horizontal non-traffic surfaces.
   2 Vertical joints on exposed surfaces of walls.
   3 Perimeter joints between interior wall surfaces and frames of interior doors.
   4 Wall and hard ceiling penetrations.
   5 Joints between miscellaneous assemblies and walls and hard ceilings.
   6 See Division 8 Section for glazing gaskets.

1.03 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

C. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI's Sealant Validation Program.

D. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
   1 Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.

E. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.

1.04 QUALITY ASSURANCE

A. Sealant Compatibility and Adhesion Testing: Use sealant manufacturer's standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
   1 Regardless of specification requirements for sealants, verify compatibility of each sealant with its respective substrates. Provide only materials known to be fully compatible with actual conditions of service. Advise Project Officer of any recommended revisions to specifications resulting from this requirement.

B. Sealant Matrix: Use Sealant Matrix developed by the National Institutes of Health (NIH) attached to end of this specification section to determine appropriate sealant for each use. Advise the University if any deviations from Sealant Matrix are recommended due to incompatibility of substrate or other professional judgement concern.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.

2.02 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

2.03 ELASTOMERIC JOINT SEALANTS

A. Interior Joints: Paintable, siliconized latex sealant complying with performance requirements of ASTM C834:
   1 Available products include but are not limited to:
      a. Tremco, Tremflex 834 Siliconized Acrylic Latex Sealant.

b. Silicones Unlimited, SU3000 Siliconized Latex Caulk.
c. AllPro Corporation, PRO 40 Siliconized Latex Sealant.

2 Joint Movement: Minimum +/- 10% of manufacturers recommended minimum joint width.

3 Color (Painted Applications): White, do not paint sealant until thoroughly inspected and accepted.

B. Color (Non-Painted Applications): Clear.

2.04 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Retain or revise first paragraph below. Tubing is used as temporary seal and secondary water barrier. Verify acceptability of tubing for sealants selected. See Evaluations.

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, non-absorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.05 MISCELLANEOUS MATERIALS

A. Generally retain first paragraph below unless it is known that priming of substrates is not required with sealants specified. Purpose of primers is to improve adhesion of sealant to substrate.

B. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

C. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.

D. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.

1 Remove foreign material from joint substrates that could interfere with adhesion of joint sealant.

2 Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

3 Remove laitance and form-release agents from concrete.

4 Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues could interfere with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Delete first paragraph below if not required.

D. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

E. Sealant Installation: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

F. Install sealant backings to support sealants during application and at position required to produce optimum sealant movement capability.
   1 Do not leave gaps between ends of sealant backings.
   2 Do not stretch, twist, puncture, or tear sealant backings.
   3 Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

G. Retain first paragraph below for sealants installed in moving joints without sealant backings.

H. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and back of joints.

I. Place sealants so they directly contact and fully wet joint substrates.
   1 Completely fill recesses provided for each joint configuration.
   2 Produce uniform, cross-sectional shapes and depths that allow optimum sealant movement capability.

J. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint.
   1 Remove excess sealants from surfaces adjacent to joint.
   2 Use tooling agents that are approved by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3 Joint Configuration: Concave joint configuration per Figure 5A in ASTM C 1193, unless
   4 otherwise indicated.

K. Clean excess sealants or sealant smears adjacent to joints as installation progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.02 PART 4 - SEALANT SCHEDULE

A. Provide sealant at all joints listed in the ABSL-2 column of the attached NIH Sealant Table.

END OF SECTION

SECTION 07 9220

WEATHERSEAL JOINT SEALANT REHABILITATION AND REPLACEMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Joint backings and accessories.

C. Owner-provided field quality control.

D. Manufacturer-provided field quality control.

1.02 SUMMARY

A. This Section Includes and is based upon the following assumption:

B. One hundred percent (100%) of the exterior sealant joints in the building exhibit varying modes of failure and/or deterioration, therefore the general condition of the sealant based on its age and visual condition is considered to have passed the end of its service life and the best, most economic option is to entirely remove and restore all building joint seals and related materials as directed by the Architect.

1 Removal, substrate preparation and replacement of failed and aged exterior elastomeric weatherproofing sealant materials.

1.03 RELATED SECTIONS:

A. Section 07 9200 - Joint Sealants" for requirements for new joint sealant applications into prepared existing locations.

1.04 REFERENCE STANDARDS

A. ASTM International (ASTM): www.astm.org :

1 ASTM C 661 - Standard Test Method for Indentation Hardness of Elastomeric Type Sealants by Means of a Durometer.

2 ASTM C 719 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants under Cyclic Movement (Hockman Cycle).

3 ASTM C 920 - Specification for Elastomeric Joint Sealants.

4 ASTM C 1135 - Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants.

5 ASTM C 1184 - Standard Specification for Structural Silicone Sealants.

6 ASTM C 1193 - Standard Guide for Use of Joint Sealants.

7 ASTM C 1248 - Test Method for Staining of Porous Substrate by Joint Sealants.

8 ASTM C 1330 - Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

9 ASTM D 2240 - Standard Test Method for Rubber Property - Durometer Hardness.

10 ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension.

B. Sealant, Waterproofing, and Restoration Institute (SWRI): www.swrionline.org.

1 SWRI Validation Program.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate installation of joint sealants with cleaning of joint sealant substrates and other operations that may impact installation or finished joint sealant work.

B. Preinstallation Conference: Conduct conference at Project Site.

1.06 ACTION SUBMITTALS

A. Product Data: For each type of joint sealant product specified, including:

1 Preparation instructions and recommendations.

2 Standard drawings illustrating manufacturer's recommended sealant joint profiles and dimensions applicable to Project.

B. Joint Sealant Schedule: Indicate joint sealant location, joint sealant type, manufacturer and product name, and color, for each application. Utilize joint sealant designations included in this Section.

C. Samples for Color Selection: For each joint sealant type.

D. Samples for Verification: For each exterior joint sealant product, for each color selected.

E. Maintain one copy of each referenced document covering installation requirements on site.

F. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

G. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

H. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
   1 Adhesion Testing: In accordance with 1.
   2 Compatibility Testing: In accordance with 1.
   3 Stain Testing: In accordance with 1; required only for stone substrates.
   4 Allow sufficient time for testing to avoid delaying the work.
   5 Deliver to manufacturer sufficient samples for testing.
   6 Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
   7 Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

I. Installation Plan: Include schedule of sealed joints, including the following.
   1 Joint width indicated in contract documents and / or required by as built conditions.
   2 Joint depth indicated estimated by existing width of existing joints and the required depth to face of backing material at centerline of joint.
   3 Method to be used to protect adjacent surfaces from sealant droppings and smears, with acknowledgement that some surfaces cannot be cleaned to like-new condition and therefore prevention is imperative.
   4 Approximate date of installation, for evaluation of thermal movement influence.
   5 Installation Log Form: Include the following data fields, with known information filled out.
      a. Unique identification of each length or instance of sealant installed.
      b. Location on project.
      c. Substrates.
      d. Sealant used.
      e. Stated movement capability of sealant.
      f. Primer to be used, or indicate as "No primer" used.
      g. Size and actual backing material used.
      h. Date of installation.
      i. Name of installer.
      j. Actual joint width; provide space to indicate maximum and minimum width.
      k. Actual joint depth to face of backing material at centerline of joint.
      l. Air temperature.

J. Preinstallation Field Adhesion Test Plan: Include destructive field adhesion testing of one sample of each combination of sealant type and substrate, except interior acrylic latex sealants, and include the following for each tested sample.
   1 Identification of testing agency.
   2 Name(s) of sealant manufacturers' field representatives who will be observing
   3 Preinstallation Field Adhesion Test Log Form: Include the following data fields, with known information filled out.
      a. Substrate; if more than one type of substrate is involved in a single joint, provide two entries on form, for testing each sealant substrate side separately.
      b. Test date.
      c. Location on project.
      d. Sealant used.
      e. Stated movement capability of sealant.
      f. Test method used.

g. Date of installation of field sample to be tested.
h. Date of test.
i. Copy of test method documents.
j. Age of sealant upon date of testing.
k. Test results, modeled after the sample form in the test method document.
l. Indicate use of photographic record of test.

1.07 QUALITY ASSURANCE

A. Owner will employ an independent testing agency to perform the field quality control inspection and testing as referenced in PART 3 of this section and as follows, to prepare and submit the field quality control plan and log, and to provide recommendations of remedies in the case of failure.
   1 Contractor shall cooperate with testing agency and repair failures discovered and destructive test location damage.

B. Field Quality Control Plan:
   1 Visual inspection of entire length of sealant joints.
   2 Non-destructive field adhesion testing of sealant joints, except interior acrylic latex sealants.
      a. For each different sealant and substrate combination, allow for one test every 12 inches in the first 10 linear feet of joint and one test every 72 inches thereafter.
      b. If any failures occur in the first 10 linear feet, continue testing at 12 inch intervals at no extra cost to Owner.
   3 Field testing agency's qualifications.
   4 Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

C. Field Adhesion Test Procedures:
   1 Allow sealants to fully cure as recommended by manufacturer before testing.
   2 Have a copy of the test method document available during tests.
   3 Take photographs or make video records of each test, with joint identification provided in the photos/videos; for example, provide small erasable whiteboard positioned next to joint.
   4 Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
   5 When performing destructive tests, also inspect the opened joint for proper installation characteristics recommended by manufacturer, and report any deficiencies.
   6 Deliver the samples removed during destructive tests in separate sealed plastic bags, identified with project, location, test date, and test results, to Owner.
   7 If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.

D. Non-Destructive Field Adhesion Test: Test for adhesion in accordance with 1, using Nondestructive Spot Method.
   1 Record results on Field Quality Control Log.
   2 Repair failed joints, having a length of 48 inches, or less.
   3 Repair failed portions of joints having increments of 48 inches or more.

E. Destructive Field Adhesion Test: Test for adhesion in accordance with 1, using Destructive Tail Procedure.
   1 Sample: At least 18 inch long.
   2 Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch by that percentage; if adhesion failure occurs before the "1 inch mark" is that distance from the substrate, the test has failed.
   3 If either adhesive or cohesive failure occurs prior to minimum elongation, take necessary measures to correct conditions and re-test; record each modification to products or installation procedures.
   4 Record results on Field Quality Control Log.

5 Repair failed portions of joints in their entirety..

F. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with 1, or other applicable method as recommended by manufacturer.

1.08 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified applicator.

B. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

C. Preconstruction compatibility and adhesion test reports.

D. Preconstruction field-adhesion test reports.

E. Field quality control adhesion test reports.

F. Warranty: Sample of unexecuted manufacturer and installer special warranties.

1.09 QUALITY ASSURANCE

A. Installer Qualifications: Experienced Installer equipped and trained for application of joint sealants required for this Project with record of successful completion of projects of similar scope.

B. Single Source Responsibility: Provide exterior joint sealants by a single manufacturer responsible for testing of Project substrates to verify compatibility and adhesion of joint sealants.

C. Preconstruction Compatibility, Staining, and Adhesion Testing: Submit [four] samples of material that will be in contact with or affect joint sealants. Test sealants with substrate materials using manufacturer's standard test method to determine requirements for joint preparation, including priming. Test sealants with related materials to verify compatibility.

D. Preconstruction Field-Adhesion Testing: Prior to installing joint sealants, field test adhesion to joint substrates using ASTM C 1193 Method A or method recommended by manufacturer. Verify adhesion is adequate. Modify joint preparation recommendations for failed joints and re-test. Submit written report to Architect.

E. Mockups: Provide joint sealant application within mockups required in other sections identical to specified joint sealants and installation methods.

1.10 VERIFICATION OF FIELD CONDITIONS

A. Contractor and Installer shall be aware that exisiting joint sealant, backer materials and adjacent surfaces may be found to contain hazardous materials such as asbestos or PCBs.

B. Owner shall verify that Hazardous Materials Testing has been done and indicates that materials to be removed or rehabilitated do not contain hazardous materials.

1 If suspected hazardous materials are encountered, do not disturb materials, and immediately notify Architect and Owner.

a. Contractor shall obtain and Owner shall pay for additional testing in order to determine the presence of undiscovered hazardous material.

1.11 WARRANTY

A. Special Installer's Warranty: Original statement on Installer's letterhead in which Installer agrees to repair or replace joint sealants that demonstrate deterioration or failure within warranty period specified shall includes inadequate substrate and joint preparation.

1 Warranty Period: Four years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants to repair or replace those that demonstrate deterioration or failure under normal use within warranty period specified.

1 Warranty Period for Silicone Sealants: 20 years date of Substantial Completion.

C. Warranty Conditions: The above Special Warranty provisions exclude deterioration or failure of joint sealants in normal use due to structural movement resulting in stresses on joint sealants exceeding sealant manufacturer's written specifications, mechanical damage, or normal accumulation of dirt or other contaminants.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Gunnable and Pourable Sealants - Basis of Design:
   1 The Dow Chemical Company DOWSIL® Contractors Weatherproofing Sealant: www.dowcorning.com.

B. Gunnable and Pourable Sealants - Other Acceptable Manufacurers
   1 BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
   2 Tremco Global Sealants: www.tremcosealants.com.
   3 Sika Corporation: www.usa-sika.com.

C. Silicone Sealants: Purpose and application as indicated: Basis of Design Product:
   1 DOWSIL® ; Product 790 Silicone Building Sealant; General Purpose: Color : CUSTOM www.dowcorning.com.
   2 DOWSIL® ; Product 756 SMS Building Sealant; Mold and Mildew Resistant:Color : CUSTOM :www.dowcorning.com.
   3 DOWSIL® ; Product 791 Silicone Weatherproofing Sealant; Glazing applications, Curtainwall components, building facade:Color : CUSTOM www.dowcorning.com.
   4 DOWSIL® Product 795 Silicone Building Sealant: Structural and non-structural glazing, structural attachment for panel systems and above-grade weathersealing joints most common constructions materials:Color : CUSTOM www.dowcorning.com.
   5 DOWSIL® Product 758 Silicone Weather Barrier Sealant: Above-grade weathersealing joints with compatible with construction materials, including peel-and-stick window flashings, building wraps, polyolefins, and PVCs :Color : As selected from Manufacturer's strandard colors: www.dowcorning.com

D. Silicone Sealants: Purpose and application as indicated: Other Acceptable Manufacurers Subject to Compliance With Requirements:
   1 BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
   2 Tremco Commercial Sealants and Waterproofing; www.tremcosealants.com.
   3 Sika Corporation: www.usa-sika.com.
   4 Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants and accessory materials that are compatible with one another, with joint substrates, and with materials in close proximity under use conditions, as demonstrated by sealant manufacturer by testing and related experience.

B. Joint Sealant Standard: Comply with ASTM C 920 and other specified requirements for each liquid-applied joint sealant.

C. Stain Test Characteristics: Where sealants are required to be nonstaining, provide sealants tested per ASTM C 1248 as non-staining on porous joint substrates indicated for Project.

D. Provide: ASTM C 920 Joint Sealant Use Types, Grades, Classes, and Uses that are used in reference specifications below are as follows:

E. Type S: Single component: ultra-low modulus, neutral-cure, silicone rubber

F. Type S: Single component, medium-modulus, neutral-cure silicone sealant

G. Grade NS: Non-sag

H. Class XX: Movement capability, percent

I. Class XX/YY: Movement capability, percent, expansion/contraction

J. Substrate Use G: Glass

K. Substrate Use M: Mortars

L. Substrate Use A: Aluminum

M. Substrate Use O: Other

2.03 ACCESSORIES

A. Joint Substrate Cleaners and Primers: Use only substrate preparation and primer materials which are recommended or provided by sealant manufacturer for application.

B. Cylindrical Sealant Backing: ASTM C 1330, Type B non-absorbent, bi-cellular material with surface skin, or Type O open-cell polyurethane, as recommended by sealant manufacturer for application.

C. Bond Breaker Tape: Polymer tape compatible with joint sealant materials and recommended by sealant manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examination of Existing Joint Sealants: Examine existing joint sealants and indicate extent of joint sealant replacement and rehabilitation on shop drawings. Examine joints for compliance with requirements for joint configuration, installation tolerances, condition of joint substrate, and other conditions affecting joint-sealant performance.

B. Preinstallation Testing: Perform preinstallation adhesion tests in accordance with manufacturer's instructions and with ASTM C 1193, Method A. Verify substrate preparation and priming result in adhesion of sealants meeting sealant manufacturer's published performance data.

1 If adhesion does not comply with published data, modify preparation and priming in accordance with sealant manufacturer's written instructions and retest.

C. Submit report indicating conditions that cannot be corrected to comply with joint sealant manufacturer's recommendations as part of the specified joint replacement or rehabilitation. Proceed with work once non-complying conditions are corrected.

3.02 PREPARATION

A. Removal of Failed Joint Sealant Materials: Cut out and completely remove joint materials and associated backing materials as indicated on drawingsand required by existing field conditions as well as those identified during pre-installation conference].

B. Surface Cleaning of Joint Substrates: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1 Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2 Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods in addition to solvent cleaning to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Remove laitance and form-release agents from concrete.

3 Clean porous and nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

3.03 APPLICATION

A. Masking: Mask adjacent surfaces to prevent staining or damage by contact with sealant or primer.

B. Joint Priming: Prime joint substrates when recommended by sealant manufacturer or when indicated by preconstruction testing or experience. Apply recommended primer using sealant manufacturer's recommended application techniques.

C. Joint Backing: Select joint backing materials recommended by sealant manufacturer to be compatible with sealant material. Install backing material at depth required to produce profile of joint sealant allowing optimal sealant movement.

1 Install bond breaker tape over substrates when sealant backings are not used.

D. Sealant Application: Install sealants using methods recommended by sealant manufacturer, in depths between 1/4 and 1/2 inch (6.4 and 12.7 mm) unless otherwise recommended for application. Apply in continuous operation from

bottom to top of joint vertically and horizontally in a single direction. Apply using adequate pressure to fill and seal joint width.

1 Tool sealants immediately with appropriately shaped tool to force sealants against joint backing and joint substrates, eliminating voids and ensuring full contact.

2 Using tooling agents approved by sealant manufacturer for application.

E. Note: Depending on substrate, primers may or may not be required to promote sealant adhesion. Testing should be conducted to determine optimum adhesion and if primer is required. Contact Sealant Manufacturer for primer recommendations.

F. Primer: Apply primer to substrates determined by manufacturer's recommended adhesion test to require primer. Apply in accordance with manufacturer's instructions.

G. Sealant: Apply bead of silicone sealant on each side of joint and 1/4 inch (6 mm) inside of applied masking tape, with minimum bonding area of 3/8 inch (9 mm), and minimum bead size as follows:

1 Rough substrate: 0.25 inch (6 mm).

2 Smooth substrate: 0.125 inch (3 mm).

H. Silicone Seal: Within 10 minutes of sealant application, press silicone extrusion into wet sealant. Apply consistent pressure with roller to ensure uniform contact.

I. Complete horizontal joints prior to vertical joints. Lap vertical seal over seal on horizontal joint.

3.04 CLEANING

A. Cleaning: Remove excess sealant using materials and methods approved by sealant manufacturer that will not damage joint substrate materials.

1 Remove masking tape immediately after tooling joint without disturbing seal.

2 Remove excess sealant from nonporous surfaces while still uncured.

3.05 FIELD QUALITY CONTROL

A. [Retain] [Owner may retain] testing agency to perform the following tests:

1 Verification that substrate preparation meets requirements.

2 Testing and certification that joint sealant materials comply with requirements.

3 Testing of application for compliance with adhesion requirements.

B. Field-Adhesion Testing: Perform adhesion tests in accordance with manufacturer's instructions and with ASTM C 1193, Method A.

1 Perform [5] tests for the first [1000 feet (300 m)] of joint length for each kind of sealant and joint substrate, and one test for each [1000 feet (300 m)] of joint length thereafter or 1 test per each floor per building elevation, minimum.

2 For sealant applied between dissimilar materials, test both sides of joint.

C. Remove sealants failing adhesion test, clean substrates, reapply sealants, and re-test. Test adjacent sealants to failed sealants.

D. Submit report of field adhesion testing indicating tests, locations, dates, results, and remedial actions taken.

3.06 EXTERIOR JOINT-SEALANT SCHEDULE

A. Joint Sealant: Single-component neutral-curing non-staining silicone JS# 1 :DOW CORNING® 790_.

1 Joint-Sealant Color:Match Architect's custom color.

2 Exterior joints in metal panel cladding systems.

3 Exterior movement joints in concrete unit masonry, or movement joints in CIP Concrete.

B. Joint Sealant: Single-component neutral-curing non-staining silicone JS# 2, 2a: DOW CORNING ®790 or 795__.

1 Joint-Sealant Color: Match Architect's custom color.

2 Exterior movement joints in brick, stone or concrete masonry.

C. Joint Sealant: Single-component neutral-curing non-staining silicone JS#3, 3a, or 3b: DOW CORNING® 790, 756, or 795_.

1 Joint-Sealant Color: As selected by Architect from manufacturer's full range Match Architect's custom color.

2 Exterior joints at stain, or mold and mildew sensitive materials, Stone Masonry, EIFS, or Stucco within exterior insulation finish systems.

D. Joint Sealant: Single-component neutral-curing non-staining silicone JS# 4:_DOW CORNING® 756_.
   1 Joint-Sealant Color: Match Architect's custom color.
   2 Exterior concealed watertight joints in cladding systems.

E. Joint Sealant: Single-component neutral-curing silicone JS#_5_DOW CORNING® 791.
   1 Exterior joints between different materials listed above.
   2 Joint-Sealant Color: As selected by Architect from manufacturer's full range
   3 olor:

F. Joint Sealant: Single-component neutral-curing non-staining silicone JS#6,6a, 6b DOW CORNING® 790, 756, or 795_.
   1 Joint-Sealant Joint-Sealant Color: As selected by Architect from manufacturer's full range.
   2 Multiple colors required to match several conditions.
   3 Exterior perimeter joints at frames of doors, windows, storefront frames, curtain wall frames, and louvers.

G. Joint Sealant: Single-component neutral-curing non-staining silicone JS#7, 7a_DOW CORNING® 795, or 756_.
   1 Joint-Sealant Color: As selected by Architect from manufacturer's full range .
   2 Multiple colors required to match several conditions.
   3 Aluminum Storefront Framing and Curtain Wall Joints, Glazing, and Structural Glazing: .
   4 All other exterior non-traffic joints.

H. Joint Sealant: Single-component neutral-curing silicone JS# 8_DOW CORNING® 790_.
   1 Exterior horizontal traffic and traffic isolation joints [: Refer to Division 32 Section: Concrete Paving Joint Sealants].
   2 Joint-Sealant Color: As selected by Architect from manufacturer's full range

END OF SECTION

SECTION 08 1115

INSULATED STEEL ENTRY DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire rated 5 panel steel doors and frames at unit entrance doors.

B. Accessories, including glazing.

1.02 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware.

B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.

C. Section 09 9000 - Painting and Coating: Field painting.

1.03 REFERENCE STANDARDS

A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.

B. ANSI A250.3 - Test Procedure and Acceptance Criteria for Factory-Applied Finish Painted Steel Surfaces for Steel Doors and Frames; 2007 (R2011).

C. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.

D. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998 (R2011).

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.

F. ASTM C236 - Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box; 1989 (Reapproved 1993).

G. ASTM C1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2011.

H. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.

I. DHI A115 Series - Specifications for Steel Doors and Frame Preparation for Hardware; Door and Hardware Institute; 2000 (ANSI/DHI A115 Series).

J. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.

K. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2007.

L. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2013.

M. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association; 2012.

N. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

O. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

P. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

Q. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.

D. Samples: Submit two samples of metal, 2 x 2 inches in size showing factory finishes, colors, and surface texture.

E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Maintain at the project site a copy of all reference standards dealing with installation.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store in accordance with NAAMM HMMA 840.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Insulated, pre-hung Steel Doors : Basis of Design:
   1 Taylor Doors ; Product Duradoor Steel Entry Doors; www.taylordoor.com
   2 Therma Tru Corporation; Product Premium Steel Serieswww.thermatru.com.

B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS AND FRAMES

A. Requirements for All Doors and Frames:
   1 Accessibility: Comply with ANSI/ICC A117.1.
   2 Door Top Closures: Flush with top of faces and edges.
   3 Door Edge Profile: Beveled on both edges.
   4 Door Texture: Smooth faces.
   5 Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
   6 Galvanizing at exterior locations: All components hot-dipped zinc-iron alloy-coated (galvannealed), manufacturer's standard coating thickness.
   7 Style and Finish: 6 Panel, raised panel, factory primed for field finish.
      a. Color: As scheduled.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 STEEL DOORS

A. Exterior Doors :
   1 Grade: ANSI A250.8 Level 3, physical performance Level A, Model 3, stile and rail.
   2 Core: Polyurethane.
   3 Top Closures for Outswinging Doors: Flush with top of faces and edges.
   4 Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
   5 Texture: Smooth faces.
   6 Insulating Value: U-value of 0.50, when tested in accordance with ASTM C1363 or ASTM C236.
   7 Weatherstripping: Integral, recessed into door edge or frame.

2.04 STEEL FRAMES

A. General:
   1 Comply with the requirements of grade specified for corresponding door.
      a. ANSI A250.8 Level 1 Doors: 16 gage frames.

2 Finish: Same as for door.

B. Exterior Door Frames: Face welded, seamless with joints filled.
1 Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
2 Finish: Factory primed, for field finishing.

2.05 ACCESSORY MATERIALS

A. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

B. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

2.06 FINISH MATERIALS

A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.

B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

B. Coat inside of other frames with bituminous coating to a thickness of 1/16 inch.

3.03 INSTALLATION

A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.

B. Coordinate frame anchor placement with wall construction.

C. Coordinate installation of hardware.

D. Coordinate installation of glazing.

E. Touch up damaged factory finishes.

3.04 TOLERANCES

A. Clearances Between Door and Frame: As specified in ANSI A250.8.

B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE - SEE DRAWINGS

END OF SECTION

SECTION 08 1416

FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush configuration; non-rated.

1.02 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

B. Section 08 1115 - Insulated Steel Entry Doors

1.03 REFERENCE STANDARDS

A. ANSI A135.4 - American National Standard for Basic Hardboard; 2012.

B. ASTM E413 - Classification for Rating Sound Insulation; 2016.

C. ASTM E1408 - Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems; 1991 (Reapproved 2000).

D. ICC (IBC) - International Building Code; 2012.

E. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.

F. NFC

G. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2019.

H. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2017.

I. UBC Std 7-2, Part II - Test Standard for Smoke- and Draft-control Assemblies; International Conference of Building Officials; 1997.

J. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

K. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

L. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

M. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

N. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Samples: Submit two samples of door construction, 12 by 12 inches in size cut from top corner of door.

D. Shop Drawings: Illustrate comprehensively door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria., identify cutouts for glazing and louvers.

E. Manufacturer's Installation Instructions: Indicate special installation instructions.

F. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 10 years ofdocumented experience.

1 Company with at least one project within past five years with value of woodwork within at least 20 percent of cost of woodwork for this project.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging, and inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

1.07 WARRANTY

A. See Section 01 7800 - Project Closeout for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the wall assembly.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS FLUSH WOOD DOORS

A. Wood Veneer Faced Doors:Basis of Design
   1 Masonite Architectural; Product Cendura Standard Painted: www.architectural.masonite.com/.

B. Other Acceptable Manufacturers
   1 Haley Brothers; Standard Flush Hollow Core Door: www.haleybros.com/#sle.
   2 Weyerhauser Co.
   3 Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS

A. Doors: See drawings for locations and additional requirements.
   1 Quality Level: Economy Grade, light duty performance, in accordance with WDMA I.S.1-A and with AWI/AWMAC/WI Architectural Woodwork Standards..
   2 Wood Veneer Faced Doors: Hollow Core unless otherwise indicated.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1 Provide hollow core doors at each location.

2.03 DOOR FACINGS

A. Veneer Facing for Transparent Finish: Select Lauan Mahogany, Grade A Veneer, plain sliced,, with random match (mismatched) between leaves of veneer, random match of spliced veneer leaves assembled on door or panel face, book and balanced matched.
   1 Vertical Edges: Any option allowed by quality standard for grade.

2.04 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:

C. Provide solid blocks at lock edge for hardware reinforcement.
   1 Provide solid blocking for other throughbolted hardware.

D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

F. Provide edge clearances in accordance with the quality standard specified.

2.05 FINISHES - WOOD VENEER DOORS

A. Field finish doors in accordance with approved sample.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

B. Use machine tools to cut or drill for hardware.

C. Coordinate installation of doors with installation of frames and hardware.

D. Coordinate installation of glazing.

E. Install door louvers plumb and level.

3.03 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.

B. Comply with specified quality standard for telegraphing, warp, and squareness.

C. Maximum Vertical Distortion (Bow): 1/8 inch measured with straight edge or taut string, top to bottom, over an imaginary 36 by 84 inches surface area.

D. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taut string, edge to edge, over an imaginary 36 by 84 inches surface area.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

3.05 SCHEDULE - SEE DRAWINGS

END OF SECTION

SECTION 08 3100

ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall mounted access units.

B. Ceiling mounted access units.

C. Access door and frame units, fire-rated and non-fire-rated, in wall and ceiling locations.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast in Place Concrete: Openings in concrete.

B. Section 04 2000 - Unit Masonry Assemblies: Openings in masonry.

C. Section 09 2116 Gypsum Board Assemblies: Access in partitions.

D. Section 09 2116 Gypsum Board Assemblies: Access in ceilings.

E. Section 08 7100 - Door Hardware: Mortise cylinder and core hardware.

F. Division 22 and 23 Sections : Plumbinig and HVAC components requiring access.

G. Section 23 3300 - Air Duct Accessories: Access doors in ductwork.

H. Division 26 Sections: Electrical components requiring access.

1.03 REFERENCE STANDARDS

A. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2019.

B. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2017.

C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

D. FM (AG) - FM Approval Guide; current edition.

E. ITS (DIR) - Directory of Listed Products; current edition.

F. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work based on access function, i.e., hand hole, personnel access, visusal inspection, etc.

C. Shop Drawings: Indicate exact position and installation detailing of each access door and/or panel unit.

D. Samples: Submit complete access units, 12 by 12 and 24 by 24 inches in size illustrating frame configuration and construction, panel construction and metal.

E. Manufacturer's Installation Instructions: Indicate installation requirements.

F. Project Record Documents: Record actual locations of each access unit.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 15 years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least 7-1/2 years documented experience and approved by manufacturer.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES

A. Wall-Mounted Units with Return Air Grille:

1 Material: Stainless Steel, type 316.

2 Size: 12 by 12 inch, unless otherwise functionally required for adequate access to components.
3 Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
4 In All Wall Types: Surface mounted face frame and door surface flush with frame surface.
5 In Gypsum Board: Drywall bead frame with door surface flush with ceiling surface.
6 Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.

B. Wall-Mounted Units in Wet Areas:
1 Material: Stainless Steel type 316.
2 Size: 12 by 12 inch, unless otherwise functionally required for adequate access to components.
3 Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
4 In Gypsum Board: Drywall bead frame with door surface flush with ceiling surface.
5 Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.

C. Fire-Rated Wall-Mounted Units:
1 Wall Fire-Rating: As indicated on drawings.
2 Material: Stainless Steel type 316.
3 Size: 12 by 12 inch, unless otherwise functionally required for adequate access to components.
4 Door/Panel: Insulated double-surface panel, with tool-operated spring or cam lock and no handle.

D. Ceiling-Mounted Units with Return Air Grille:
1 Material: Stainless Steel type 316.
2 Size - Lay-In Grid Ceilings: To match module of ceiling grid.
3 Size in Other Ceilings: 12 by 12 inch, unless otherwise indicated, or required for adequate access to component.
4 Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

E. Fire-Rated Ceiling-Mounted Units:
1 Ceiling Fire-Rating: As indicated on drawings.
2 Material: Stainless Steel type 316.
3 Size: 12 by 12 inch, unless otherwise indicated or required for adequate access to component.
4 Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

2.02 MANUFACTURERS

A. Wall and Ceiling Access Doors:
1 Milcor by Commercial Products Group of Hart & Cooley, Inc: www.milcorinc.com.
2 Babcock-Davis: www.babcockdavis.com.
3 J.L. Industries
4 Substitutions: See Section 01 6000 - Product Requirements.

2.03 ACCESS DOORS AND PANELS

A. All Units: Factory fabricated, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies units are to be installed in.

B. Units in Fire Rated Assemblies: Fire rating equivalent to the fire rated assembly in which they are to be installed.
1 Provide products listed and labeled by UL or ITS (Warnock Hersey) as suitable for the purpose specified and indicated.
2 Provide certificate of compliance from authority having jurisdiction indicating approval of fire rated doors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION

SECTION 08 7100

DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for wood and Insulated metal doors.

B. Hardware for fire-rated doors.

C. Access Control hardware. (Cipher Locks)

D. Thresholds.

E. Weatherstripping, seals and door gaskets.

1.02 RELATED REQUIREMENTS

A. Section 08 1115 - Insulated Steel Entry Doors

B. Section 08 1416 - Flush Wood Doors.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.

C. BHMA A156.1 - American National Standard for Butts and Hinges; 2016.

D. BHMA A156.2 - American National Standard for Bored and Preassembled Locks & Latches; 2017.

E. BHMA A156.3 - American National Standard for Exit Devices; 2014.

F. BHMA A156.4 - American National Standard for Door Controls - Closers; 2013.

G. BHMA A156.5 - American National Standard for Cylinders and Input Devices for Locks; 2014.

H. BHMA A156.6 - American National Standard for Architectural Door Trim; 2015.

I. BHMA A156.7 - American National Standard for Template Hinge Dimensions; 2016.

J. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; 2015.

K. BHMA A156.12 - American National Standard for Interconnected Locks; 2013.

L. BHMA A156.13 - American National Standard for Mortise Locks & Latches Series 1000; 2017.

M. BHMA A156.14 - American National Standard for Sliding and Folding Door Hardware; 2013.

N. BHMA A156.15 - American National Standard for Release Devices - Closer Holder, Electromagnetic and Electromechanical; 2015.

O. BHMA A156.16 - American National Standard for Auxiliary Hardware; 2018.

P. BHMA A156.17 - American National Standard for Self Closing Hinges & Pivots; 2014.

Q. BHMA A156.18 - American National Standard for Materials and Finishes; 2016.

R. BHMA A156.20 - American National Standard for Strap and Tee Hinges, and Hasps; 2017.

S. BHMA A156.21 - American National Standard for Thresholds; 2014.

T. BHMA A156.22 - American National Standard for Door Gasketing and Edge Seal Systems Sponsor; 2017.

U. BHMA A156.23 - American National Standard for Electromagnetic Locks; 2017.

V. BHMA A156.31 - American National Standard for Electric Strikes and Frame Mounted Actuators; 2013.

W. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2016.

X. BHMA A156.115W - American National Standard for Hardware Preparation in Wood Doors with Wood or Steel Frames; 2006.

Y. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; 2004.

Z. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; 1993; also in WDHS-1/WDHS-5 Series, 1996.

AA. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

AB. ITS (DIR) - Directory of Listed Products; current edition.

AC. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2019.

AD. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

AE. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware will be installed upon.

B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

C. Convey Owner's keying requirements to manufacturers.

D. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; require attendance by all affected installers.

E. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.

C. Shop Drawings:
   1 Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts, electrical characteristics and connection requirements .
   2 Submit manufacturer's parts lists and templates.

D. Samples: Prior to preparation of hardware schedule:
   1 Submit 1 sample of hinge, latchset, lockset, and closer illustrating style, color, and finish.
   2 Samples will be returned to supplier.

E. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.

F. Keying Schedule: Submit for approval of Owner.

G. Samples: Provide the following prior to preparation of hardware schedule;
   1 Submit one (1) sample of hinge, latchset, lockset, and closer illustrating style, color, and finish.
   2 Samples will be returned to supplier.

H. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

I. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.

J. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
   1 Submit manufacturer's parts lists and templates.
   2 Bitting List: List of combinations as furnished.

K. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

L. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

M. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
   1 See Section 01 6000 - Product Requirements, for additional provisions.

2 Extra Lock Cylinders: One for each master keyed group.
3 Tools: One set of all special wrenches or tools applicable to each different or special hardware component, whether supplied by the hardware component manufacturer or not.

1.06 QUALITY ASSURANCE

A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

C. Hardware Supplier Qualifications: Company specializing in supplying the type of products specified in this section with at least three years documented experience.

D. Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

B. Hardware should be marked by hardware set and door number prior to delivery.

C. Delivery: Hardware to be delivered by supplier – no direct shipments are permitted.

D. Storage: Provide a secure storage that includes shelving adequate for hardware.

1.08 WARRANTY

A. See Section 01 7800 - Project Closeout, for additional warranty requirements.

B. Provide five year warranty for door closers and Automatic Flushbolts.

C. Extra Materials: Provide 1 lockset of each function (L9010, L9050, L9070, L9080) with appropriate trim. (4 required)

D. 3 each tools for adjustment of doors closers and exit devices.

E. 2 copies of approved finish hardware schedule which also reflects keying schedule.

F. 2 copies of installation instruction for closers, locksets and exit devices.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Allegion Brands, Ives, LCN, Schlage, Steelcraft, or Von Duprin: www.allegion.com/us/#sle.

B. Assa Abloy Brands, Corbin Russwin, Curries, McKinney, Norton, Sargent, or Yale: www.assaabloydss.com/#sle.

C. Best Access Systems, division of Stanley Security Solutions: www.bestaccess.com/#sle.

D. DORMA USA, Inc: www.dorma.com/#sle.

E. Hager Companies: www.hagerco.com/#sle.

F. Trimco Hardware: www.trimcohardware.com/#sle.

G. Substitutions: See Section 01 6000 - Product Requirements.

2.02 GENERAL REQUIREMENTS

A. Provide door hardware specified, or as required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.

B. Provide items of a single type of the same model by the same manufacturer.

C. Provide products that comply with the following:
1 Applicable provisions of federal, state, and local codes.
2 ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
3 Applicable provisions of NFPA 101, Life Safety Code.
4 Fire-Rated Doors: NFPA 80.

5 Hardware on Fire-Rated Doors, Except Hinges: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.
6 Auxiliary Hardware: BHMA A156.16.
7 Straps, Tee Hinges and Hasps: BHMA A156.20.
8 Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.
9 Hardware Preparation for Wood Doors with Wood or Steel Frames: BHMA A156.115W.
10 Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
11 Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

D. Function: Lock and latch function numbers and descriptions of manufactures series as listed in hardware schedule.

E. Electrically Operated and/or Controlled Hardware: Provide all power supplies, power transfer hinges, relays, and interfaces required for proper operation; provide wiring between hardware and control components and to building power connection.

F. Finishes: Provide door hardware of the same finish unless otherwise indicated.
1 Primary Finish: Satin Stainless Steel US 26D.
2 Secondary Finish: Satin chrome plated over nickel on brass or bronze, 626 (approx US26D).
a. Use secondary finish in kitchens, bathrooms, and other spaces containing chrome or stainless steel finished appliances, fittings, and equipment; provide primary finish on one side of door and secondary finish on other side if necessary.
3 Finish Definitions: BHMA A156.18.
4 Exceptions:
a. Where base metal is specified to be different, provide finish that is an appearance equivalent according to BHMA A156.18.
b. Hinges for Fire-Rated Doors: Steel base metal with painted finish.
c. Door Closer Covers and Arms: Color to be selected by Architect from manufacturer's standard colors.
d. Aluminum Surface Trim and Gasket Housings: Anodized to match door, not to match other hardware.
e. Hardware for Aluminum Storefront Doors: Finished to match door, except hand contact surfaces to be satin stainless steel.

G. Fasteners:
1 Mineral Core Wood Doors: Sex bolts.
2 Concrete and Masonry Substrates: Stainless steel machine screws and lead expansion shields.

2.03 LOCKS AND LATCHES

A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
1 Hardware Sets indicate locking functions required for each door.
2 If no hardware set is indicated for a swinging door provide an office lockset.
3 Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
4 Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.
5 In door sections, where a lock cylinder referenced to this Section is specified, furnish and install a mortise lock cylinder keyed to the building keying system.

B. Lock Cylinders: Manufacturer’s standard tumbler type, six-pin standard core.
1 Provide cams and/or tailpieces as required for locking devices required.

C. Keying: Key to existing Masterkey System.
1 Include construction keying.
2 When providing keying information, comply with DHI Handbook "Keying systems and nomenclature".

D. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".
1 Roller Latches:

2.04 HINGES

A. Hinges:

B. Hinges: Provide hinges on every swinging door.
   1 Provide five-knuckle full mortise butt hinges unless otherwise indicated.
   2 Provide ball-bearing hinges at all doors having closers.
   3 Provide hinges in the quantities indicated required by door height and weight.
   4 Provide non-removable pins on exterior outswinging doors.
   5 Where electrified hardware is mounted in door leaf, provide power transfer hinges.

C. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7; standard weight, unless otherwise indicated.
   1 Provide hinge width required to clear surrounding trim.

D. Quantity of Hinges Per Door:
   1 Doors up to 60 inches High: Two hinges.
   2 Doors From 60 inches High up to 90 inches High: Three hinges.
   3 Doors 90 inches High up to 120 inches High: Four hinges.
   4 Doors over 120 inches High: One additional hinge per each additional 30 inches in height.
   5 Dutch Doors: Two hinges each leaf.

E. Manufacturers - Hinges:
   1 Assa Abloy Brands; McKinney: www.assaabloydss.com/#sle.
   2 The width of hinges shall be sufficient to clear trim. Furnish three hinges for doors up to 7'-6" high. Supply one additional hinge for every 2-1/2 feet or fraction thereof.

F. Other Acceptable Manufacturers
   1 Bommer Industries, Inc: www.bommer.com.
   2 C. R. Laurence Company, Inc: www.crl-arch.com.
   3 Hager Companies: www.hagerco.com.
   4 Substitutions: See Section 01 6000 - Product Requirements.

2.05 PUSH/PULLS

A. Push/Pulls:

B. Push/Pulls: Comply with BHMA A156.6.
   1 Provide push and pull on doors not specified to have lockset, latchset, exit device, or auxiliary lock.
   2 On solid doors, provide matching push plate and pull plate on opposite faces.
   3 On glazed storefront doors, provide matching push/pull bars on both faces.

C. Manufacturers - Push/Pulls:
   1 Assa Abloy Brands, McKinney: www.assaabloydss.com/#sle.
   2 C. R. Laurence Company, Inc: www.crl-arch.com.

D. Push Plates/ Pulls:
   1 C. R. Laurence Company, Inc: www.crl-arch.com.
   2 Hager .

E. Other Acceptable Manufacturers
   1 Hager Companies: www.hagerco.com/#sle.
   2 Hiawatha, Inc, division of Activar Construction Products Group, Inc: www.activarcpg.com/hiawatha.
   3 Trimco Hardware: www.trimcohardware.com.

2.06 CYLINDRICAL LOCKSETS

A. Locking Functions: As defined in BHMA A156.2, and as follows.
   1 Passage: No locking, always free entry and exit.
   2 Privacy: F76, emergency tool unlocks.
   3 Office: F82 Grade 1, key not required to lock, unlocks upon exit.
   4 Classroom: F84, key required to lock.

5 Intruder Classroom: F110, keyed both sides.
6 Communicating: F80 or F113.
7 Hotel: F93.
8 Always-Locked: F86, key required to lock, may not be left unlocked.
9 Two-Key Entry: F88, outside locked by key from both sides, free egress
10 Store Door: F91, locked by key from both sides, not an emergency exit (must be unlocked during occupied hours).
11 Exit Only: F89, may not be left unlocked.

B. Manufacturers - Cylindrical Locksets:
1 Assa Abloy Brands, Corbin Russwin, Sargent, or Yale: www.assaabloydss.com/#sle.
2 Best Access Systems, division of Stanley Security Solutions: www.bestaccess.com/#sle.
3 Hager Companies: www.hagerco.com.
4 Schlage, an Allegion brand: www.allegion.com/us.

2.07 INTERCONNECTED LOCKSETS

2.08 AUXILIARY LOCKS (DEADBOLTS)

A. Locking Functions: As defined in BHMA A156.5, and as follows:
1 Deadbolt, Classroom: E017.
2 Public Entry/Exit ("Nightlatch"): E023, D012
3 Deadbolt, Unoccupied: E015 or F17, deadbolt by key outside and turn inside.

B. Manufacturers - Auxiliary Locks (Deadbolts): Same as other locks.

2.09 CLOSERS

A. Closers:

B. Closers: Complying with BHMA A156.4.
1 Provide surface-mounted, door-mounted closers unless otherwise indicated.
2 Provide a door closer on every exterior door.
3 Provide a door closer on every fire- and smoke-rated door. Spring hinges are not an acceptable self-closing device unless specifically so indicated.
4 On pairs of swinging doors, if an overlapping astragal is present, provide coordinator to ensure the leaves close in proper order.
5 At corridors, locate door-mounted closer on room side of door.
6 At outswinging exterior doors, mount closer in inside of door.

C. Manufacturers - Surface Mounted Closers:
1 Assa Abloy Brands, Corbin Russwin, Norton, Rixson, Sargent, or Yale: www.assaabloydss.com/#sle.
2 Other Acceptable Manufacturers
a. DORMA USA, Inc; 7400 Series, 8600 Series, 8900 Series, and TS93: www.dorma.com/#sle.
3 LCN, an Allegion brand; _____: www.allegion.com/us/#sle.LCN, an Allegion brand; _____: www.allegion.com/us/#sle.LCN, an Allegion brand; _____: www.allegion.com/us/#sle.

2.10 STOPS AND HOLDERS

A. Stops: Complying with BHMA A156.8; provide a stop for every swinging door, unless otherwise indicated.
1 Provide wall stops, unless otherwise indicated.
2 If wall stops are not practical, due to configuration of room or furnishings, provide overhead stop.
3 Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop unless specifically so stated.

B. Manufacturers - Wall and Floor Stops/Holders:
1 Assa Abloy Brands, McKinney: www.assaabloydss.com/#sle.
2 C. R. Laurence Company, Inc: www.crl-arch.com.
3 Trimco., Inc: www.trimcohardware.com/#sle.
4 Substitutions: See Section 01 6000 - Product Requirements.

2.11 GASKETING AND THRESHOLDS

A. Thresholds / Weatherstripping and Gasketing: .

B. Gaskets: Complying with BHMA A156.22.
   1 On each door in smoke partition, provide smoke gaskets; top, sides, and meeting stile of pairs. If fire/smoke partitions are not indicated on drawings, provide smoke gaskets on each door identified as a "smoke door" and 20-minute rated fire doors.
   2 On each exterior door, provide weatherstripping gaskets, unless otherwise indicated; top, sides, and meeting stiles of pairs.
      a. Where exterior door is also required to have fire or smoke rating, provide gaskets functioning as both smoke and weather seals.
   3 On each exterior door, provide door bottom sweep, unless otherwise indicated.

C. Thresholds: Complying with BHMA A156.21.
   1 At each exterior door, provide a threshold unless otherwise indicated.
   2 Field cut threshold to frame for tight fit.

2.12 PROTECTION PLATES AND ARCHITECTURAL TRIM

A. Protection Plates:

B. Protection Plates:
   1 Kickplate: Provide on push side of every door with closer, except aluminum storefront and glass entry doors.

C. Drip Guard: Provide projecting drip guard over all exterior doors unless they are under a projecting roof or canopy.

D. Manufacturers - Protection Plates and Architectural Trim:
   1 Rockwood Manufacturing Company, an Assa Abloy brand: www.rockwoodmfg.com/#sle.
   2 Hager Companies.: www.hager.com
   3 Hiawatha, Inc: www.hiawathainc.com.
   4 IVES Hardware: www.iveshardware.com
   5 Trimco: www.trimcohardware.com/#sle.

2.13 GENERAL REQUIREMENTS FOR DOOR HARDWARE PRODUCTS

A. Provide products that comply with the following:
   1 Applicable provisions of Federal, State, and local codes.
   2 ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
   3 Applicable provisions of NFPA 101, Life Safety Code.
   4 Fire-Rated Doors: NFPA 80.
   5 All Hardware on Fire-Rated Doors : Listed and classified by UL as suitable for the purpose specified and indicated.
   6 Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
   7 Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

B. Finishes: Identified in schedule at end of section and as follows.
   1 Continuous Hinges628
   2 Butts (Interior)652
   3 Flush Bolts626
   4 Locksets626
   5 Closers689
   6 Exit Devices626
   7 Exit Trim626
   8 SilencersGray
   9 Cylinders626
   10 Wall Stops630

11 Floor Stops626
12 Kickplates / Mopplates630
13 Wall Magnets628
14 Overhead Stops652
15 Hospital Push/Pulls626

2.14 KEYING

A. Door Locks: Great grand master keyed, and as follows.
   1 Include construction keying.
   2 Key to existing Falcon Great Grand Masterkey keying system.
B. Supply keys in the following quantities:
   1 4 construction keys.
   2 2 change keys for each lock.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.
B. Verify that electric power is available to power operated devices and of the correct characteristics.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.
B. Use templates provided by hardware item manufacturer.
C. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.
D. Mounting heights for hardware from finished floor to center line of hardware item. As indicated in the following list; unless noted otherwise in Door Hardware Sets Schedule or on the drawings.
   1 For steel doors and frames: Comply with DHI (LOCS) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames".
   2 For Wood Doors: Comply with DHI WDHS.3 "Recommended Locations for Architectural Hardware for Flush Wood Doors".
E. Set exterior door thresholds with full-width bead of elastomeric sealant on each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.03 FIELD QUALITY CONTROL

A. Provide an Architectural Hardware Consultant to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.04 ADJUSTING

A. Adjust work under provisions of Section 01 7000 - Execution Requirements.
B. Adjust hardware for smooth operation.

3.05 PROTECTION

A. Protect finished Work under provisions of Section 01 7000 - Execution Requirements.
B. Do not permit adjacent work to damage hardware or finish.

3.06 DOOR SCHEDULE SEE DRAWINGS.

END OF SECTION

SECTION 08 8000

GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Float Glass

B. Safety Glass

C. Insulating glass.

D. Glazing compounds.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealants for other than glazing purposes.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015.

C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2015).

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

F. ASTM C1036 - Standard Specification for Flat Glass; 2016.

G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.

H. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2014.

I. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

J. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2015.

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2020.

L. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).

M. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.

N. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2017.

O. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.

P. ASTM F1233 - Standard Test Method for Security Glazing Materials And Systems; 2008 (Reapproved 2019).

Q. GANA (GM) - GANA Glazing Manual; 2008.

R. GANA (SM) - GANA Sealant Manual; 2008.

S. GANA (LGRM) - Laminated Glazing Reference Manual; 2009.

T. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

U. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (2016).

V. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2017.

W. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2014, with Errata (2017).

X. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2017.

Y. UL 752 - Standard for Bullet-Resisting Equipment; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting related work of this section; require attendance by each affected trade.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data on insulating, float and safety Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

D. Samples: Submit two samples 12 by 12 inches in size for each type of glass to be used.

E. Certificates: Certify that products meet or exceed specified requirements.

F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1 See Section 01 6000 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods. Maintain one copy on site.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum 15 years documented experience.

1.07 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for additional requirements.

1.08 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 40 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.09 WARRANTY

A. See Section 01 7800 - Project Closeout for additional warranty requirements.

B. Insulating Glass Units: Provide a ten (10) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

C. Laminated Glass: Provide a ten (10) year manufacturer warranty to include coverage for delamination, including replacement of failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Glass Fabricators:
   1 Trulite Glass & Aluminum Solutions, LLC: www.trulite.com.
   2 Viracon, Inc: www.viracon.com.

B. Float Glass Manufacturers: Basis of Design
   1 Vitro Architectural Glass (formerly PPG Industries, Inc.) Products: www.ppgideascapes.com.
      a. Clear Float: Solarban® 70 XL solar control low-e Glass by PPG®
      b. Tinted: None

C. Other Acceptable Float Glass Manufacturers
   1 AGC Glass Company North America, Inc: www.us.agc.com.

2 Cardinal Glass Industries: www.cardinalcorp.com.
3 Guardian Industries Corp: www.sunguardglass.com.

D. Laminated Glass Manufacturers:
1 Guardian Industries Corp: www.sunguardglass.com.
2 Cardinal Glass Industries: www.cardinalcorp.com.
3 Viracon, Architectural Glass segment of Apogee Enterprises, Inc: www.viracon.com.
4 Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
1 Design Pressure: Calculated in accordance with ASCE 7.
2 Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
3 Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
4 Glass thicknesses listed are minimum.

2.03 GLASS MATERIALS

A. Clear Float Glass: Provide float glass based glazing unless noted otherwise.
1 Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
2 Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
3 Kind FT - Fully Tempered Type: Complies with ASTM C1048.
4 Impact Resistant Safety Glass: Complies with ANSI Z97.1 - Class B, or 16 CFR 1201 - Category I criteria.
5 Thicknesses: 6 mm (0.25 inch) minimum and as indicated. Provide greater thickness as required for exterior glazing wind load design, or interior structural glazing applications.

B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
1 Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category I impact test requirements.
2 Polyvinyl Butyral (PVB) Interlayer: 0.030 inch thick, minimum.

2.04 GLASS MATERIALS

A. Clear Float Glass (Type G-1): Clear, annealed.
1 Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
2 Comply with ASTM C 1048.
3 6 mm minimum thick.

B. Safety Glass (Type SG-1): Clear; fully tempered.
1 Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select) and ASTM C 1048.
2 Comply with 16 CFR 1201 test requirements for Category II.
3 Where glazing is to be installed in fire-rated partition, provide glazing that is also fire-protection rated in accordance with applicable code.
4 6 mm minimum thick.
5 Provide this type of glazing in the locations required by code.

C. Safety Glass Type [SG-2]:Laminated Glass: Clear Float glass laminated in accordance with ASTM C1172.
1 Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
2 Plastic Interlayer: 0.060 inch thick, minimum.
3 Where fully tempered is specified or required, provide glass that has been tempered by the tong-less horizontal method.

D. Low E Glass (Type G-5): Float type, heat strengthened, tempered where required, clear.
1 Coating on inner surface.

2 Visible light transmittance of 64 percent, visible light transmittance of 12 percent, U-Value - winter of .28, U-Value - summer of .26, shading coefficient of 0.32, solar heat gain coefficient of .27, light to solar gain of 2.37. Basis of design/performance is PPG Solarban 70XL.
3 Comply with ASTM C 1036, Type I, transparent flat, Quality Q3 (glazing select).
4 6 mm minimum thick.

2.05 INSULATING GLASS UNITS

A. Manufacturers:
1 Glass: Any of the manufacturers specified for float glass.

B. Basis of Design Manufacturer.
1 PPG Industries, Inc: www.ppgideascapes.com.

C. Other Acceptable Manufacturers
1 Cardinal Glass Industries; _____: www.cardinalcorp.com/#sle.
2 Guardian Glass, LLC; _____: www.guardianglass.com/#sle.
3 Substitutions: See Section 01 6000 - Product Requirements.

D. Insulating Glass Units: Types as indicated.
1 Durability: Certified by an independent testing agency to comply with ASTM E2190.
2 Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
3 Metal Edge Spacers: Stainless steel, bent and soldered corners.
4 Spacer Color: Brushed Stainless.
5 Edge Seal:
6 Color: Grey.
7 Purge interpane space with dry air, hermetically sealed.

E. Type IGU-1A - Insulating Glass Units: Vision glass, double glazed.
1 Applications: Exterior glazing unless otherwise indicated.
2 Space between lites filled with air.
3 Outboard Lite: Annealed float glass, 1/4 inch thick, minimum, low E coated..
a. Tint: Clear.
b. Coating: Low-E (passive type), on #2 surface.
4 Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
a. Tint: Clear.

F. Total Thickness: 1 inch.
1 Thermal Transmittance (U-Value), Winter - Center of Glass: 0.29, nominal.
2 Thermal Transmittance (U-Value), Summer - Center of Glass: 0.27, nominal.
3 Visible Light Transmittance (VLT): 42 percent, nominal.
4 Solar Heat Gain Coefficient (SHGC): 0.23 percent, nominal.
5 Shading Coefficient 0.27
6 Outdoor Visible Light Transmittance: 64%

2.06 GLAZING COMPOUNDS

A. Type GC-1 - Glazing Putty: Polymer modified latex recommended by manufacturer for outdoor use, knife grade consistency; gray color.

B. Type GC-2 - Butyl Sealant: Single component; ASTM C920, Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.

C. Type GC-5 - Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

2.07 ACCESSORIES

A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
   1 Width: As required for application.
   2 Thickness: As required for application.
   3 Spacer Rod Diameter: As required for application.
   4 Manufacturers:
      a. Pecora Corporation: www.pecora.com/#sle.
      b. Tremco Global Sealants: www.tremcosealants.com/#sle.
      c. Substitutions: See Section 01 6000 - Product Requirements.

D. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

E. Glazing Clips: Manufacturer's standard type.

F. Smoke Removal Window/Glazing Unit Markings: Adhesive backed markings affixed to manually operable or fixed windows of high-rise buildings to identify units intended for post-fire smoke removal in compliance with ICC (IBC) and local building officials.

2.08 SOURCE QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that the minimum required face and edge clearances are being provided.

C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

D. Verify that sealing between joints of glass framing members has been completed effectively.

E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.

B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.

D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.

E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.

B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 INSTALLATION - WET GLAZING METHOD (SEALANT AND SEALANT)

A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.

B. Place setting blocks at 1/4 points and install glazing pane or unit.

C. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch intervals, 1/4 inch below sight line.

D. Fill gaps between glazing and stops with Silicone type sealant to depth of bite on glazing, but not more than 3/8 inch below sight line to ensure full contact with glazing and continue the air and vapor seal.

E. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.06 INSTALLATION - WET/DRY GLAZING METHOD (PREFORMED TAPE AND SEALANT)

A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.

B. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with butyl sealant.

C. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.

D. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

E. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.

F. Install removable stops, with spacer strips inserted between glazing and applied stops 1/4 inch below sight lines.
   1 Place glazing tape on glazing pane of unit with tape flush with sight line.

G. Fill gap between glazing and stop with Silicone type sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.

H. Apply cap bead of Silicone type sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.07 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

C. Monitor and report installation procedures and unacceptable conditions.

3.08 CLEANING

A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

B. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

C. Remove nonpermanent labels immediately after glazing installation is complete.

D. Clean glass and adjacent surfaces after sealants are fully cured.

E. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.09 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

3.10 SCHEDULES SEE DRAWINGS

END OF SECTION

SECTION 09 2116

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Cold Formed Metal channel ceiling framing.

C. Shaft wall system.

D. Fire rated area separation walls.

E. Acoustic insulation.

F. Gypsum wallboard.

G. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: wood blocking for support of wall mounted components .

B. Section 09 9610 - High Performance Coatings - Specialty

1.03 REFERENCE STANDARDS

A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2018).

B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2018.

C. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2016).

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.

E. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017.

F. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board; 2004 (Reapproved 2020).

G. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2018.

H. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.

I. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

J. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2019b.

K. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2018.

L. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2019.

M. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2017.

N. ASTM C1288 - Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets; 2017.

O. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2019.

P. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

Q. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.

R. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2020.

S. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).

T. ASTM E413 - Classification for Rating Sound Insulation; 2016.

U. GA-214 - Recommended Levels of Gypsum Board Finish; Gypsum Association; 2007.

V. GA-216 - Application and Finishing of Gypsum Panel Products; 2016.

W. GA-224 - Installation of Predecorated Gypsum Board; Gypsum Association; 2008.

X. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2016.

Y. GA-600 - Fire Resistance Design Manual; 2015.

Z. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

AA. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers; 2016.

AB. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.

1.04 SYSTEM DESCRIPTION

A. Acoustic Attenuation for Interior Gypsum Board Ceilings : STC of 60 minimum calculated in accordance with ASTM E 413, based on tests conducted in accordance with ASTM E 90.

B. Shaft Wall: Configure and install components as required to achieve the following performance levels:
   1 Air Pressure Within Shaft: Intermittent loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
   2 Acoustic Attenuation: STC of 50-54 calculated in accordance with ASTM E 413, based on tests conducted in accordance with ASTM E 90.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

E. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

F. Samples: Submit two samples of gypsum board finished with simulated plaster application, 12 by 12 inches in size, illustrating finish color and texture.

1.06 QUALITY ASSURANCE

A. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.
   1 Maintain one copy of standards at project site.

B. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 10 years of experience.

1.07 REGULATORY REQUIREMENTS

A. Conform to applicable code for fire rated assemblies as indicated on drawings.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

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

B. Shaft Walls at HVAC Shafts: Provide completed assemblies with the following characteristics:
   1 Air Pressure Within Shaft: Sustained loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
   2 Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

2.02 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:

1 Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
2 Dietrich Metal Framing: www.dietrichindustries.com.
3 Marino: www.marinoware.com.
4 The Steel Network, Inc: www.SteelNetwork.com.
5 Substitutions: See Section 01 6000 - Product Requirements.

B. Non-structural Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
1 Exception: The minimum metal thickness and section properties requirements of ASTM C645 are waived provided steel of 40 ksi minimum yield strength is used, the metal is continuously dimpled, the effective thickness is at least twice the base metal thickness, and maximum stud heights are determined by testing in accordance with ASTM E72 using assemblies specified by ASTM C754.
2 Studs: C-shaped with knurled or embossed faces.
3 Runners: U shaped, sized to match studs.
4 Ceiling Channels: C-shaped.
5 Furring Members: Hat-shaped sections, minimum depth of 7/8 inch.
6 Resilient Furring Channels: Single or double leg configuration; 1/2 inch channel depth.
a. Products:

C. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.
1 Products:
a. Same manufacturer as other framing materials.

D. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws, and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
1 Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100.
2 Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot-dipped galvanized coating.
3 Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.
4 Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.

E. Preformed Top Track Firestop Seal:
1 Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
1 American Gypsum Company: www.americangypsum.com.
2 CertainTeed Corporation: www.certainteed.com.
3 Continental Building Products: www.continental-bp.com.
4 Georgia-Pacific Gypsum: www.gpgypsum.com.
5 National Gypsum Company: www.nationalgypsum.com.
6 USG Corporation: www.usg.com.

B. Backing Board For Wet Areas: One of the following products:
1 Application: Surfaces behind tile in wet areas including ceilings.
2 Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3 Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
a. Standard Type: Thickness 5/8 inch.
b. Products:

C. Backing Board For Non Wet Areas: One of the following products:

1 Application: Surfaces behind tile in non wet areas including ceilings.
2 Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3 Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
a. Standard Type: Thickness 5/8 inch.
b. Products:
1) Georgia-Pacific Gypsum; DensArmor Plus.
2) National Gypsum Company; Gold Bond eXP Tile Backer.

D. Gypsum Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
1 Application: Ceilings with high performance coatings.
2 Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3 Type: Regular, in locations indicated.
4 Regular Board Thickness: 5/8 inch.
5 Edges: Tapered.
6 Products:
a. American Gypsum Company; M-Bloc: www.americangypsum.com/#sle.
b. Georgia-Pacific Gypsum; ToughRock Mold-Guard Gypsum Board: www.gpgypsum.com/#sle.
c. Georgia-Pacific Gypsum; DensArmor Plus: www.gpgypsum.com/#sle.
d. Substitutions: See Section 01 6000 - Product Requirements.

E. Gypsum Wallboard: ASTM C 1396/C 1396M. Sizes to minimize joints in place; ends square cut.
1 Regular Type:
a. Application: Use for vertical surfaces, unless otherwise indicated.
b. Thickness: 5/8 inch, as indicated.
c. Edges: Tapered.
2 Ceiling Board: Special sag-resistant type.
a. Application: Ceilings, unless otherwise indicated.
b. Thickness: 5/8 inch.
c. Edges: Tapered.

F. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396M; ends square cut.
1 Application: Ceilings for high performance coatings{Ceilings for high performance coatings}.
2 Core Type: Regular, as indicated.
3 Thickness: 5/8 inch, as indicated.
4 Edges: Tapered.

G. Shaftwall and Coreboard: Type X; 1 inch thick by 24 inches wide, beveled long edges, ends square cut.
1 Glass Mat Faced Type: Glass mat shaftliner gypsum panel or glass mat coreboard gypsum panel as defined in ASTM C1658/C1658M.
2 Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3 Products:
a. Georgia-Pacific Gypsum LLC; DensGlass Ultra Shaftliner.

2.04 FIBERGLASS REINFORCED BOARD MATERIALS

2.05 GYPSUM WALLBOARD ACCESSORIES

A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: _____ inch.

B. Acoustic Insulation: ASTM C 665; preformed glass fiber, friction fit type, unfaced. Thickness: Full depth of framing. .

C. Acoustic Sealant: See Section 07 9200 - Joint Sealants

D. Finishing Accessories: ASTM C1047, rolled zinc or rigid plastic, unless noted otherwise.
1 Types: As detailed or required for finished appearance.
2 Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.

3 Products:
a. Same manufacturer as framing materials.

E. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.

F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

G. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 SHAFT WALL INSTALLATION

A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
1 Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 16 inches on center.
2 Install studs at spacing required to meet performance requirements.

B. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.

3.03 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
1 Level ceiling system to a tolerance of 1/1200.
2 Laterally brace entire suspension system.
3 Install bracing as required at exterior locations to resist wind uplift.

C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

D. Blocking: Install light gage, mechanically fastened steel channel blocking for support of:
1 Framed openings.
2 Provide 6 inch, 16 gage, steel runner notched to bypass steel studs and secure with two 3/8" pan head screws at each stud.

3.04 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
1 Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.05 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
1 Exception: Tapered edges to receive joint treatment at right angles to framing.

C. Provide 1/2" gap between bottom of gypsum board and floor at all partitions to ceilng transitions for seaklant joint.

D. Glass Mat Faced Gypsum Board: Install in strict accordance with manufacturer's instructions.

E. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of nonrated double-layer assemblies, which may be installed by means of adhesive lamination.

3.06 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: as indicated.

1 Extend partition control joints to the ceiling structure centered on top of the frame and extend through a bulkhead/soffit condition.
2 Control joints in ceilings should be located to intersect column penetrations, light fixtures, and air diffusers that can impose stresses on the ceiling.
3 Place control joints consistent with lines of building spaces and as follows:
a. Not more than 30 feet apart on walls and ceilings over 50 feet long.
b. At exterior soffits, not more than 20 feet apart in both directions.
c. Where a partition, furring or column fireproofing abuts a structural element (except for a floor) or dissimilar wall or ceiling
d. Where a ceiling or soffit abuts a structural elements, dissimilar wall or partition, or other vertical penetration
e. Where construction changes within the plane of the partition or ceiling
f. Where a partition or furring run exceeds 30 feet
g. Where ceiling dimensions exceed 50 feet in either direction with perimeter relief, or 30 feet without relief
h. Where exterior soffits and ceilings exceed 30 feet in either direction
i. Where wings of L, U, and T shaped ceiling areas are joined

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.07 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
1 Level 5: ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
2 Level 4: ceilings to receive HP coating finish unless otherwise indicated.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
1 Feather coats of joint compound so that camber is maximum 1/32 inch.
2 Taping, filling, and sanding are not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
3 Taping, filling, and sanding are not required at base layer of double-layer applications.

D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

E. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.08 TOLERANCES

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

3.09 FINISH LEVEL SCHEDULE

A. Level 2: Fire rated partitions above finished ceilings concealed from view.

B. Level 2: Utility areas and areas behind cabinetry.

C. Level 3: Walls scheduled to receive textured wall finish.

D. Level 4: Walls and ceilings scheduled to receive flat or eggshell paint finish.

E. Level 5: Walls and ceilings scheduled to receive semi-gloss or gloss paint finish, or high performance coating..

END OF SECTION

SECTION 09 9000

PAINTS AND COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints, stains, varnishes, and other coatings.

C. Surfaces to be finished are indicated in this section and on the Drawings.

1.02 RELATED REQUIREMENTS

A. Section 05 5000 - Metal Fabrications: Shop-primed items.

B. Section 05 5100 - Metal Stairs: Shop-primed items.

1.03 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.

C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

1.04 SUBMITTALS

A. Product Data: Provide complete list of all products to be used, with the following information for each:
   1 Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2 Cross-reference to specified paint system(s) product is to be used in; include description of each system (copy of relevant MPI Manual page is acceptable).

B. Samples: Submit three paper "drop" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1 Where sheen is specified, submit samples in only that sheen.
   2 Where sheen is not specified, submit each color in each sheen available.

1.05 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the work of this section with minimum 10 years documented experience.

B. Maintain one copy of relevant portions of MPI Architectural Painting Specification Manual on project site at all times.

C. Material Safety Data Sheets: At project site maintain file of MSDS sheets for each product used; become familiar with and follow manufacturer's stated application and safety requirements.

1.06 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Paints and Coatings: Any manufacturer listed in MPI Approved Products List (at www.paintinfo.com) under applicable MPI product reference number, unless otherwise indicated.

B. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

C. Provide all paint and coating products from the same manufacturer to the greatest extent possible.

D. In the event that a single manufacturer cannot provide all specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
   1 Substitution of MPI-approved products by a different manufacturer is preferred over substitution of unapproved products by the same manufacturer.
   2 Substitution of a different system using MPI-approved products by the same manufacturer will be considered.

E. Paints: Acceptable manufacturers are limited to the following:
   1 Duron, Inc: www.duron.com.
   2 Glidden Professional: www.gliddenprofessional.com.
   3 PPG Architectural Finishes, Inc: www.ppgaf.com.

F. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS - GENERAL

A. Volatile Organic Compound (VOC) Content:
   1 Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   2 Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

B. Paints and Coatings: Provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI Categories, except as otherwise indicated.
   1 Provide ready mixed paints and coatings, except field-catalyzed coatings.
   2 Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.03 PAINT SYSTEMS

A. Provide Premium Grade systems (2 top coats) as defined in MPI Architectural Painting Specification Manual, except as otherwise indicated.

B. Where a specified paint system does not have a Premium Grade, provide Custom Grade system.

C. Where a specified paint system does not have a Custom Grade, provide Premium Grade system.

D. Where sheen is not specified or more than one sheen is specified, sheen will be selected later by Architect from the manufacturer's full line.

E. Provide colors as scheduled on Drawings.

2.04 INTERIOR PAINT SYSTEMS

A. Concrete Masonry Unit Vertical Surfaces:
   1 Applications include but are not limited to walls.
   2 INT 3.1A Latex: Latex Primer Sealer MPI #3, Latex MPI #43, 44, 52, 53, 54 or 114.
   3 : INT 3.1C High Performance Architectural Latex: Latex Primer Seal MPI #3, HIPAC Latex MPI #138, 139, 140 or 141.

PART 3 EXECUTION

3.01 SCOPE -- SURFACES TO BE FINISHED

A. Paint all exposed surfaces except where indicated not to be painted or to remain natural; the term "exposed" includes areas visible through permanent and built-in fixtures when they are in place.

B. Paint the surfaces described in PART 2, indicated on the Drawings, and as follows:
   1 If a surface, material, or item is not specifically mentioned, paint in the same manner as similar surfaces, materials, or items, regardless of whether colors are indicated or not.
   2 Paint surfaces behind movable equipment and furnishings the same as similar exposed surfaces.
   3 Paint surfaces to be concealed behind permanently installed fixtures, equipment, and furnishings, using primer only, prior to installation of the permanent item.

4 Paint back sides of access panels and removable and hinged covers to match exposed surfaces.
5 Finish top, bottom, and side edges of exterior doors the same as exposed faces.
6 Paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment occurring in finished areas to match background surfaces, unless otherwise indicated.
7 Paint equipment, piping, conduit, and exposed duct work in utility areas in colors according to the color coding scheme indicated.
a. Refer to Section 22 0553 and Section for schedule of color coding of equipment, duct work, piping, and conduit.
8 Paint all mechanical and electrical equipment, including that which is factory-finished, exposed to weather or to view on the roof and outdoors.
9 Paint shop-primed mechanical and electrical items occurring in finished areas.
10 Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
11 Paint interior surfaces of air ducts and convector and baseboard heating cabinets with flat, nonspecular black paint where visible through registers, grilles, or louvers.
12 Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.
13 Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

C. Do Not Paint or Finish the Following Items:
1 Items fully factory-finished unless specifically noted; factory-primed items are not considered factory-finished.
2 Items indicated to receive other finish.
3 Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
4 Polished and brushed stainless steel items.
5 Acoustical materials.
6 Concealed piping, ductwork, and conduit.

3.02 EXAMINATION

A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials; report incompatible primer conditions and submit recommended changes for Architect's approval.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
1 Plaster and Gypsum Board: 12 percent.
2 Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
3 Interior Wood: 15 percent, measured in accordance with ASTM D4442.
4 Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
5 Concrete Floors: 8 percent.

E. Measure the ph factor of concrete, masonry, and mortar before starting any finishing process, using the method specified in MPI Architectural Painting Manual.
1 Report results in writing to Architect before starting work.
2 If results of test indicates need for remedial action, provide written description of remedial action. If a different primer or paint systems is required, state the total cost of the change. Do not proceed with remedial action or change without receiving written authorization from Architect.

3.03 PREPARATION

A. Prepare surfaces as specified in MPI Architectural Painting Specification Manual and as follows for the applicable surface and coating; if multiple preparation treatments are specified, use as many as necessary for best results; where the Manual references external standards for preparation (e.g. SSPC standards), prepare as specified in those standards; comply with coating manufacturer's specific preparation methods or treatments, if any.

B. Coordinate painting work with cleaning and preparation work so that dust and other contaminants do not fall on newly painted, wet surfaces.

C. Surface Appurtenances: Prior to preparing surfaces or finishing, remove electrical plates, hardware, light fixtures, light fixture trim, escutcheons, machined surfaces, fittings, and similar items already installed that are not to be painted.
   1 If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before preparation and finishing.
   2 After completing painting in each space or area, reinstall items removed using workers skilled in the trades involved.

D. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.

E. Marks: Seal with shellac those which may bleed through surface finishes.

F. Impervious Surfaces: Remove mildew by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Concrete, Cement Plaster and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
   1 Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
   2 Use abrasive blast-cleaning methods if recommended by paint manufacturer.
   3 Determine alkalinity and moisture content of surfaces by performing appropriate tests as specified in MPI Manual. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture is present.
   4 Etch concrete as specified in MPI Manual.

H. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

I. Plaster Surfaces to be Painted: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

J. Asphalt, Creosote, or Bituminous Surfaces to be Painted: Remove foreign particles to permit adhesion of finishing materials. Apply latex based sealer or primer.

K. Insulated Coverings to be Painted: Remove dirt, grease, and oil from canvas and cotton.

L. Concrete Floors to be Painted: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

M. Aluminum Surfaces to be Painted: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
   1 Test coat anodized treatments with primer as recommended by anodized treatment manufacturer; if manufacturer can not be reasonably found, test per industry standards.

N. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
   1 Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical or chemical methods as recommended as best practice by primer manufacturer.

O. Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

1 Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.

P. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

Q. Interior Wood Items to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

R. Interior Wood Items to Receive Transparent Finish: Sand wood to obtain a uniform appearance before immediately starting work. Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

S. Exterior Wood to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

T. Exterior Wood to Receive Transparent Finish: Remove dust, grit, and foreign matter; seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes with tinted exterior calking compound after sealer has been applied. Prime concealed surfaces.

U. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces (6) with clear sealer.

V. Metal Doors to be Painted: Prime metal door top, sides and bottom edge surfaces (6).

3.04 APPLICATION

A. Apply products in accordance with manufacturer's instructions and as specified or recommended by MPI Manual, using the preparation, products, sheens, textures, and colors as indicated.
1 Provide completed work matching approved samples for color, texture, and coverage.
2 Remove, refinish, or repaint work not complying with requirements.

B. Do not apply finishes over dirt, rust, scale, grease, moisture, scuffed surfaces, or other conditions detrimental to formation of a durable coating film; do not apply finishes to surfaces that are not dry.

C. Use applicators and methods best suited for substrate and type of material being applied and according to manufacturer's instructions.
1 Brush Application: Use brushes best suited for the type of material applied; use brush of appropriate size for the surface or item being painted; produce results free of visible brush marks.
2 Roller Application: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
3 Spray Application: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
4 Where application method is listed in the MPI Manual for the paint system that application method is required; otherwise any application method recommended by manufacturer for material used and objects to be painted is acceptable.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate; provide total dry film thickness of entire system as recommended by manufacturer.
1 Number of coats and film thickness required are the same regardless of application method.
2 If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.
3 Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.

E. Apply finish to completely cover surfaces with uniform appearance without brush marks, runs, sags, laps, ropiness, holidays, spotting, cloudiness, or other surface imperfections.

1 Before applying finish coats, apply a prime coat of material recommended by manufacturer, unless the surface has been prime coated by others; where evidence of suction spots or unsealed areas in first coat appear, recoat primed and sealed surfaces to ensure finish coat with no burn through or other defects due to insufficient sealing.
2 Apply first coat to surface that has been cleaned, pretreated, or otherwise prepared as soon as practical after preparation and before subsequent surface deterioration.
3 Do not apply succeeding coats until the previous coat has cured as recommended by manufacturer.
4 Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat will not cause the undercoat to lift or lose adhesion.
5 If manufacturer's instructions recommend sanding to produce a smooth, even surface, sand between coats.
6 Before applying next coat vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
7 Pigmented (Opaque) Finishes: Provide smooth, opaque surface of uniform finish, color, appearance, and coverage.
8 Stippled Finish: Roll and redistribute paint to even, fine texture; leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections; back roll final coat to achieve a uniform surface.

F. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.

B. Owner will provide field inspection.

3.06 CLEANING AND PROTECTION

A. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from site.

C. Protect other work, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting as approved by Architect.

D. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

E. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in MPI Manual.

3.07 SCHEDULE - COLORS (SEE DRAWINGS

END OF SECTION

SECTION 10 1400

SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Directories

B. Installation of Room and Door Signs furnished and installed by the Contractor.

C. Interior directional and informational signs.

1.02 RELATED REQUIREMENTS

A. Section 01 1300 - Project Management and Coordination

B. Section 01 1700 - Execution Requirements.

1.03 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.

B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

D. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines; 2002.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
   1 When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
   2 When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
   3 Submit for approval by Owner through Architect prior to fabrication.

D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

F. Verification Samples: Submit samples showing colors specified.

G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1 Curved Sign Media Suction Cups: One for each 100 signs; for removing media.

1.05 QUALITY ASSURANCE

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

1.07 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Flat Signs:
   1 APCO Signs: www.apcosigns.com
   2 Best Sign Systems, Inc: www.bestsigns.com/#sle.
   3 Mohawk Sign Systems, Inc: www.mohawksign.com/#sle.
   4 Seton Identification Products: www.seton.com/aec/#sle.
   5 Substitutions: See Section 01 6000 - Product Requirements.

2.02 SIGNAGE APPLICATIONS

A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 _____, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
   1 Sign Type: Flat signs with engraved panel media as specified.
   2 Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
   3 Character Height: 1-1/2 inch, or as required to comply with Campus Standard.
   4 Sign Height: 3 inches, or as required to comply with Campus Standard.
   5 Office Doors: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section for replaceable occupant name.
   6 Assembly and Meeting Rooms: Identify with the room names and numbers shown on the drawings; in addition, provide "window" section with sliding "In Use/Vacant" indicator.
   7 Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
   8 Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.

C. Interior Directional and Informational Signs:
   1 Sign Type: Same as room and door signs.

D. Emergency Evacuation Maps:
   1 Allow for one map per elevator lobby.
   2 Map content to be provided by Owner.
   3 Use clear plastic panel silk-screened on reverse, in brushed aluminum frame, screw-mounted.

2.03 SIGN TYPES

A. Flat Signs: Signage media without frame.
   1 Edges: Square.
   2 Corners: Square.
   3 Wall Mounting of One-Sided Signs: Tape adhesive.
   4 Suspended Mounting: Stainless steel suspension cables, cable clamps, and ceiling fastener suitable for attachment to ceiling construction indicated.

B. Radius / Curved Signs: One-piece, curved extruded aluminum media holder securing flat, flexible sign media by curved lip on two sides; other two sides closed by end caps; concealed mounting attachment.
   1 Sizes: As indicated on drawings.
   2 Finish: Natural (clear) anodized.
   3 Sign Orientation: Curved in horizontal section.
   4 Wall Mounting of One-Sided Signs: Mechanical anchorage, with predrilled holes, and set in clear silicone sealant.
   5 Suspended Mounting: Stainless steel suspension cables, cable clamps, and ceiling fastener suitable for attachment to ceiling construction indicated.

C. Color and Font: Unless otherwise indicated:
   1 Character Font: Helvetica, Arial, or other sans serif font.
   2 Character Case: Upper case only.
   3 Background Color: Clear.
   4 Character Color: Contrasting color.

2.04 TACTILE SIGNAGE MEDIA

A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
   1 Total Thickness: 1/16 inch.

2.05 NON-TACTILE SIGNAGE MEDIA

A. Silk Screened Plastic Panels: Letters and graphics silk screened onto reverse side of plastic surface:
   1 Sign Color: Color as selected.
   2 Total Thickness: 1/8 inch.

2.06 ACCESSORIES

A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.

B. Exposed Screws: Stainless steel.

C. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Locate signs where indicated on attached schedule and as required by ADA Standards:

D. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

END OF SECTION

SECTION 10 4400

FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher cabinets.

C. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

B. Section 09 9123 - Interior Painting: Field paint finish.

C. Section 21 1200 - Fire-Suppression Standpipes: Cabinet enclosure for extinguishers.

1.03 REFERENCE STANDARDS

A. NFPA 10 - Standard for Portable Fire Extinguishers; 2017, with Errata (2018).

B. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.

C. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.05 FIELD CONDITIONS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguishers:

1 Amerex Corporation: www.amerex-fire.com

2 Kidde, a unit of United Technologies Corp: www.kidde.com/#sle.

3 Pyro-Chem, a Tyco Business: www.pyrochem.com/#sle.

4 Substitutions: See Section 01 6000 - Product Requirements.

B. Fire Extinguisher Cabinets and Accessories:

1 Amerex Corporation; Product #A 441: www.amerex-fire.com

2 JL Industries, Inc: www.jlindustries.com.

3 Larsen's Manufacturing Co: www.larsensmfg.com.

4 Potter-Roemer: www.potterroemer.com.

5 Substitutions: See Section 01 6000 - Product Requirements.

2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.

1 Class: A:B:C type.

2 Size: 10 pound.

3 Finish: Baked polyester powder coat, red color.

4 Temperature range: Minus 40 degrees F to ___ degrees F.

C. Dry Chemical Type Fire Extinguishers: Stainless steel tank, with pressure gage.
   1 Class ABC.
   2 Size 10.
   3 Finish: Baked enamel, Red color.

2.03 FIRE EXTINGUISHER CABINETS

A. Cabinet Configuration: Semi-recessed type.
   1 Size to accommodate accessories.
   2 Trimless type.

B. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinges.

C. Door Glazing: Float glass, clear, 1/8 inch thick, and set in resilient channel glazing gasket.

D. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.

E. Fabrication: Weld, fill, and grind components smooth.

F. Finish of Cabinet Exterior Trim and Door: No.4 - Brushed stainless steel.

G. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES

A. Extinguisher Brackets: Formed steel, chrome-plated.

B. Cabinet Signage: Owner's standard flag type wall sign.

C. Cabinet Graphic: "FIRE EXTINGUISHER"
   1 Red Lettering vertical on glazed panel of cabinet door.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install cabinets plumb and level in wall openings, dimensioned from finished floor to handle of cabinet door in accordance with ADA ABA Accessibility Guidelines, chapter 308.

C. Secure rigidly in place.

D. Place extinguishers in cabinets.

3.03 SCHEDULES SEE LIFE SAFETY PLANS FOR LOCATIONS.

END OF SECTION

SECTION 260500
GENERAL ELECTRICAL WORK

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

A. The accompanying General Conditions shall apply to and form a part of this Section.

1.2 GENERAL REQUIREMENTS

A. Carefully examine General Conditions, other specification Sections, and other drawings (in addition to electrical), in order to be fully acquainted with their effect on electrical work.

B. Do all work in compliance with following applicable codes:

1. National Electrical Code (NEC).
2. National Electrical Safety Code (NESC).
3. National Electrical Manufacturers Association (NEMA).
4. American National Standards Institute (ANSI).
5. Insulated Cable Engineers Association (ICEA).
6. Institute of Electrical and Electronic Engineers (IEEE).
7. American Society for Testing and Materials (ASTM).
8. Joint Industrial Council (JIC).
9. Illumination Engineering Society (IES).
10. Applicable Local Codes.
11. Americans with Disabilities Act (ADA).

C. Do all work in compliance with laws and ordinances and local authorities having jurisdiction and, where applicable, utility companies. Obtain and pay for any and all required permits, inspections, certificates of inspections and approval, and the like, and deliver such certificates to the Architect.

D. Cooperate with other trades and contractors at job. Perform work in such manner and at such times as not to delay work of other trades. Complete all work as soon as the condition of the structure and installation of equipment will permit. Patch, in a satisfactory manner and by the proper craft, any work damaged by electrical work.

E. All equipment (wiring devices, light fixtures, panelboards, disconnect switches, conductors, raceways, boxes, cabinets, circuit breakers, low voltage equipment, auxiliary systems, motors, machines, etc.) used for this project shall be tested by Underwriter's Laboratories, Inc and have “UL” nameplate.

1.3 DEFINITIONS

1. Provide: Furnish all materials, hardware, equipment, labor and services required for the installation of complete and properly working equipment and/or systems as shown on the drawings and described herein.

2. Wire: Furnish all conduit, wiring, materials, hardware, equipment, labor and services required for complete and proper operation and/or control of equipment and/or systems as shown on the drawings and described herein.

3. Install: Furnish all labor.

4. Furnish: Furnish all conduit, wiring, materials, hardware, equipment.

5. Work: A complete and properly working installation of materials for equipment and/or systems as shown on the drawings and described herein.

6. AWG:American Wire Gage.

7. NEC: National Electrical Code - latest edition or the latest edition adopted by the local authorities having jurisdiction where applicable.

8. NFPA: National Fire Protection Association.

9. OSHA: Occupation Safety and Health Administration.

10. UL: Underwriter's Laboratories, Inc.

11. NEMA: National Electrical Manufacturers Association.

12. IEEE: Institute of Electrical and Electronic Engineers.

13. ADA: The Americans with Disabilities Act.

14. Concealed: Rendered inaccessible by the structure or finish of the building.

15. Exposed: On or attached to the surface or behind panels designed to allow access.

16. OFCI: Owner furnish, contractor install.

17. OFOI: Owner furnish, owner install.

18. NIC: Not in contract.

1.4 DRAWINGS

A. The drawings indicate only diagrammatically the extent, general character and approximate location of work. Where work is indicated but with minor details omitted, furnish and install it complete and so as to perform its intended functions. For building details and mechanical equipment follow architectural, structural, and mechanical drawings and fit electrical work thereto.

B. Take finish dimensions at the job site in preference to scale dimensions.

C. Except as above noted, make no changes or deviations from the work as shown or specified except on written order of the Engineer.

D. Obtain from manufacturer's data on all equipment, the dimensions of which may affect electrical work. Use this data to coordinate proper service characteristics, entry locations, etc., and to ensure minimum clearances are maintained.

1.5 QUALIFICATIONS OF CONTRACTOR

A. The electrical contractor shall have had experience of at least the same size and scope as this project, on at least two other projects, within the last 5 years in order to be qualified to bid this project. This qualification shall also apply to his subcontractors.

B. Workmen shall be experienced in their respective trade. Workmanship of installed work shall be first class and will be so judged by the Architect/Engineer. Substandard work shall be removed and replaced.

C. Qualifications stated for the electrical contractor shall also apply to any subcontractors employed by the electrical contractor during the course of this work.

1.6 SITE VISIT

A. The Bidders shall visit the site to thoroughly familiarize themselves with existing conditions prior to submitting their bid. Include cost in bid for any additional work required to satisfy contract documents. No allowances will be made for lack of knowledge of existing conditions.

1.7 ELECTRICAL SERVICE CHARACTERISTICS

A. Existing electrical services shall be as shown on drawings.

1.8 WARRANTY

A. See GENERAL CONDITIONS (one-Year warranty of conformance with drawings and specifications).

B. In addition to the foregoing warranty, Contractor shall and does hereby warrant all materials and equipment furnished under this Division of the Specifications to be free from defects and to function or operate satisfactorily for one year after final acceptance of the work, and that any items not meeting this requirement will be made good by him without cost to owner, provided such defects or failures are not due to abuse, neglect, or lack of reasonable and ordinary maintenance.

PART 2 - PRODUCTS

2.1 APPROVED MATERIALS AND DEVICES

A. Unless otherwise specified, provide only new, standard first grade materials throughout, conforming to standards established by Underwriter's Laboratories, Inc., and so marked and labeled, together with manufacturer's brand or trademark. All equipment subject to approval of Architect/Engineer before installation. All like items shall be of one manufacture.

2.2 ELECTRICAL EQUIPMENT

A. Where shown on the drawings or specified herein, furnish and install electrical equipment.

B. Furnish all materials, hardware, equipment, labor and services required for the installation of complete and properly working installations as shown on the drawings and described herein.

C. References in these specifications to a particular manufacturer or model number shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Equipment by manufacturers other than those specified shall be submitted for review in accord with Section 260501.

D. All equipment shall be installed by qualified workmen who shall have reviewed all manufacturer's data for purposes of coordinating service characteristics, entry locations, mounting requirements, dimensions, etc.

E. The contractor shall cooperate with the Owner, other trades, etc. for coordination of their requirements or the effects of the installed equipment on the overall project.

2.3 AUXILIARY SYSTEMS

A. Where shown on the drawings or specified herein, furnish and install electrical auxiliary systems.

B. Furnish all materials, hardware, equipment, labor and services required for the installation of a complete and properly working systems as shown on the drawings and described herein.

C. References in these specifications to a particular manufacturer or model number shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Equipment by manufacturers other than those specified shall be submitted for review in accord with Section 260501.

D. All systems equipment shall be installed by qualified systems technicians in the employ of the systems contractor, or by qualified workmen in the employ of the Contractor under the supervision of qualified representatives of the manufacturer. "Qualified representatives" shall be factory authorized or certified by the systems equipment manufacturer.

E. The systems technicians and/or contractor shall cooperate with the Owner, other trades, etc. for coordination of their requirements or the effects of the installed systems on the overall project.

PART 3 - EXECUTION

3.1 WORKMANSHIP

A. The work shall be in accordance with the NEC and the rules and regulations of local bodies having jurisdiction.

B. All work shall be executed in a workmanlike manner and shall present a neat and mechanical appearance upon completion.

C. Care shall be exercised that all items are plumb, straight, level.

D. Care shall be exercised so that not less than code clearance is allowed for all panels, switchboards, etc. Do not allow other trades to infringe on this clearance. Minimum code clearance shall be as required by Article 110 of the NEC.

E. Care shall be exercised that no piping, ducts, or equipment foreign to the electrical equipment or architectural appurtenances shall be allowed to be installed in, enter or pass through the exclusively dedicated spaces above, adjacent to and below switchboards and panelboards as set forth in Article 384, paragraph 4, of the NEC.

F. Balance load as equally as practicable on service and all feeders, circuits and panelboard buses.

3.2 ACCEPTANCE TESTING

A. Upon completion of work, the entire wiring system shall be tested, and shall be shown to be in perfect working condition in accordance with the intent of the specifications and drawings. It shall be the responsibility of the Electrical Contractor to have all systems ready for operation and to have an electrician available to operate same in accordance with and under the supervision of the inspection representative of the Architect/Engineer. The electrician shall be available to assist in removal of panelboard fronts, etc., to permit inspection as required.

3.3 TEMPORARY POWER

A. The electrical contractor shall provide temporary electrical wiring for construction if necessary. The temporary service shall be a minimum of 400 amperes, three phase, four wire, 120/240 volts fused at main disconnect. All receptacles on this temporary service shall be protected by ground fault interruptible circuit breakers.

END OF SECTION 260500

SECTION 260501
ELECTRICAL-SCOPE OF WORK

PART 1 - GENERAL

1.1 WORK REQUIRED

A. Removal or relocation of all electrical 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 completed project or any code pertaining thereto.

B. Complete electric lighting systems, power systems and auxiliary systems as shown or herein specified.

C. Furnishing and installation of all electrical items shown on drawings or herein specified, unless shown or specified otherwise.

D. Furnishing and installation of disconnect switches for motors as required and where shown.

E. Connection of all equipment requiring electrical connection, mentioned in this Section or shown on drawings, whether furnished by electrical contractor or others. Coordinate with other sub-contractors and verify required electrical connections for their equipment.

F. Complete raceways, pull wires, outlets and junction boxes for voice data and cable television systems.

H. Addition and alterations to existing fire alarm system as required to meet code.

I. ADA communication features for telephone and doorbell in accessible rooms shown on plans. Provide complete turn key system.

PART 2 - PRODUCTS

2.1 PROPOSED SUBSTITUTES

A. Submit to Architect ten (15) days prior to bid date three (3) copies of any items which are proposed as substitutes for those specified.

2.2 SHOP DRAWINGS AND CATALOG DATA

A. Submit to Architect within fifteen (15) days after award of contract, prior to purchasing, six (6) copies of manufacturer's shop drawings and catalog data for the items listed below.

B. All shop drawings of a specific item or system shall be in one submittal and shall be marked to clearly identify the manufacturer, the intended use of the item, and if not readily apparent, the intended location for installation of the item.

C. Shop drawings of all power equipment shall contain exact details of device placement, phasing and numbering, in form of elevations, for each piece of equipment.

D. Shop drawings submittals shall include:

Load Centers
Safety Switches
Lighting Fixtures
Lighting Control Devices
Wireways
Receptacles
Terminal Cabinets
Cable
Wiring Devices
Equipment Coordination Data Sheets
Ceiling Coordination Data Sheets
As required by individual sections of these Specifications

E. Shop Drawings for the following items may consist of typewritten lists, listing manufacture with description, to be used (one only for each item).

Building Wire
ROMEX Wiring
Conduit: Rigid, I.M.C., E.M.T.
Conduit, PVC
EMT Couplings and Connectors
Wire Connectors

F. Obtain manufacturer's data on all equipment requiring electrical service and review it for purposes of coordinating service characteristics, entry locations, mounting requirements, dimensions, etc. Verify that the electrical service requirements are as shown on the electrical drawings or, if at variance to that shown, indicate the area of nonconformance. Submit one copy of this data with shop drawings, along with a statement of the following:

1. The information contained in the submittal includes data on all equipment within the scope of this project which will require electrical service or coordination with electrical work.

2. The information contained in the submittal has been reviewed by the electrical contractor, with the general contractor's project manager, and that the electrical service requirements will be coordinated with the information obtained from the manufacturer's data.

The statement shall identify the source of the information and shall be signed by the representative of the electrical contractor responsible for obtaining and coordinating the information and the general contractor's project manager.

G. Obtain data on all ceilings and review it for purposes of coordinating mounting requirements, dimensions, recess depth etc., of light fixtures. Verify that the proposed mounting trim and hardware are correct for the ceiling to be utilized and that depth of recessed light fixtures and cable tray will not be in conflict with HVAC equipment, ductwork, structural members, etc. Electrical contractor shall assist the mechanical contractor in preparation of above ceiling coordination drawings in corridors. Coordination drawings shall show duct, cable tray, pipe, recessed light fixtures, etc. Submit one copy of this data with shop drawings, along with a statement of the following:

The information contained in the submittal has been reviewed by the electrical contractor and the general contractor' project manager and the mounting details are correct for the proposed application.

The statement shall identify the source of the information and shall be signed by the representative of the electrical contractor and the general contractor's project manager.

H. None of the above items shall be installed until shop drawings or catalog data has been accepted in writing. Any listed item not submitted even if specified shall be considered not acceptable and shall be removed if directed.

PART 3 - EXECUTION

3.1 MOTORS STARTERS AND CONTROLS

A. Unless otherwise specified or shown, all motors will be furnished and installed under other sections of the specifications.

B. Unless otherwise specified or shown, all individually mounted starters and/or equipment control contactors shall be furnished under other sections of these specifications.

C. Installation of individual mounted starters, equipment control contactors and all power wiring connections to all motors, starters, equipment control contactors and equipment shall be performed under this section of these specifications.

D. Where required by the NEC or local codes, each motor or piece of equipment required to have a disconnecting mean within sight of the motor or equipment shall be so equipped. All such disconnects shall be furnished and installed under this section of these specifications unless provided as part of an equipment package furnished under other sections. This requirement shall apply whether shown on the drawings or not.

E. Where required by the NEC or local codes, each piece of HVAC equipment required to have a 15 ampere, 120 volt, receptacle within sight of the motor or equipment shall be so equipped. All such receptacles shall be furnished and installed under this section of these specifications unless provided as part of an equipment package furnished under other sections. Receptacles shall be equipped with weatherproof covers and Class "A" ground fault protection where located out of doors or subject to moisture and shall be wired to the nearest general convenience outlet circuit. This requirement shall apply whether shown on the drawings or not.

3.2 EXCAVATION, CUTTING, PATCHING

A. Perform all excavating and cutting as required to receive electrical work, and after inspection and approval of work by Architect, do all required backfilling, patching and repairing. Obtain specific approval of Architect before cutting into any structural members.

B. For all such work employ competent workmen, and finish in a neat and workmanlike manner, equal to quality and appearance of adjacent work.

3.3 FIRESTOPPING

A. Wall, floor and smoke/fire barrier penetrations shall be sealed as required to maintain the fire rating of the penetrated barrier.

B. All penetrations shall be sealed utilizing "Fire Barrier" as manufactured by 3M (no exceptions). "Fire Barrier" may be applied in strips or with a caulking gun as required by jobsite conditions. Penetrations which are too large for sealing with "Fire Barrier" alone shall be repaired to match existing and then sealed with "Fire Barrier".

C. Panelboards, equipment enclosures, outlet boxes, etc. installed in fire rated partitions shall be boxed in with wall board or other suitable fire rated material as required to maintain or restore the fire rating of the assembly.

D. Shall comply with National Electrical Code section 300-21, 800-52(b) and 820-52(b).

3.4 ROOF PENETRATION

A. Furnish roof flashings for all equipment installed under this Section that penetrates the roof. Appropriate flashings are specified under Roofing and Sheet Metal Section. Supply these flashings for installation under Roofing and Sheet Metal Section.

3.5 PAINTING

A. Finish painting of any exposed raceways is not included in this Section. (See Painting and Finishing Section).

3.6 IDENTIFICATION

A. Identification nameplates shall be laminated plastic.

B. Each switchboard and panelboard shall be equipped with a nameplate with 1/4" minimum letters.

C. Each individual mounted circuit breaker, switch, starter, contactor and/or any other control or protective device shall be equipped with a nameplate with 1/4" minimum letters. Nameplates on fusible equipment shall state fuse size.

D. Each branch circuit in a switchboard or panelboard shall be identified.

1. Panelboards with covers and directory pockets shall have typewritten directories.

2. Switchboards and panelboards without directories shall have a nameplate with 1/8" minimum letters installed adjacent to each circuit device stating equipment fed and fuse size, if applicable.

E. All nameplates shall have white background with red letters for emergency power and white background with black letters for normal power.

Nameplate for panelboards, disconnect switches, individual mounted circuit breakers shall include equipment designation or load served, voltage, phase and source of feed. Typical nameplate:

LS-313N
120/240V 1PH 4W

F. Each junction box shall be marked to identify the system it serves. The following color coding system shall be spray painted on each box cover:

1. Normal - Galvanized

2. Fire Alarm System - Red

G. Junction boxes containing power circuits shall have associated panel and circuit numbers, for voice data shall have "VD" and for security shall have "SC" printed on the cover.

3.7 STORAGE OF MATERIALS

A. Store all materials to prevent damage from rust, corrosion, physical injury, etc.

B. Keep site clean of accumulation of cartons, trash, debris, etc.

3.8 "AS BUILT" DRAWINGS

A. A set of electrical drawings shall be kept on the job site on which all changes from the contract drawings are recorded, in red, on a day-to-day basis.

3.9 OPERATIONS AND MAINTENANCE INSTRUCTION

A. At the completion of the job, the electrical contractor shall turn over to the Owner:

One (1) set of print marked "as built" reflecting the actual work done.

Three (3) sets of all equipment catalog and maintenance data.

Three (3) sets of shop drawings on all equipment requiring same.

One (1) CD of as built drawings and specification.

Spare lamps

Spare fuses

B. The contractor shall explain and demonstrate all systems to the Owner's representative.

3.10 ACCESS PANELS

A. Access panels for electrical equipment, devices, junction boxes, etc., shall be provided where building finishes do not allow access. This Contractor shall furnish and have installed appropriate access panels except when such panels are specified otherwise in other sections of these specifications, in which case, this Contractor shall coordinate panel locations with the installing Contractor.

END OF SECTION 260501

SECTION 260519
CONDUCTORS

PART 1 - GENERAL

1.1 SCOPE

A. This section outlines the quality and type of conductors to be used in the various systems, locations and conditions.
B. Electrical wiring shall conform to requirements in section 112.1 of 2015 Technical Code of the City of Birmingham. This project is located within the designated fire district.

PART 2 - PRODUCTS

2.1 WIRE AND CABLE 600 VOLT

A. Conductors shall have current carrying capacities as per NEC, #12 minimum except for controls, and fixture wire.

B. Conductors for general use, sized #10 and smaller, shall be solid copper. Conductors #8 and larger, and any size to motors or vibrating equipment shall be stranded copper. Feeder conductors serving panelboards, meter centers and secondary conductors serving switchboards #2 and larger shall be compact aluminum.

C. All conductor insulation shall be 600 volt.

D. Insulation for branch circuits, sized #10 and smaller, shall be color coded type THHN/XHHW.

E. Insulation for feeders, #8 and larger, and for circuits run in wet or dry locations or below grade shall be THHN-THWN.

F. Conductor color codes shall be as set forth below.

G. All branch circuit conductors used in wood studs and wood roof joists inside apartments shall be non-metallic sheathed (ROMEX) type cable. See section 260520 of specifications.

2.2 FIXTURE WIRE

A. Fixture wire shall be Type SF-2 except that type THHN or XHHW may be used in the channel of and flex to fluorescent fixtures.

2.3 CONTROL WIRE

A. Control wire shall be #14, 19 strand, type THHN-THWN, rated 90 degrees C full color range.

2.4 MANUFACTURER

A. Wire and cable shall be manufactured by Rome, Cerro, General, American, Essex, Aetna, Colonial, Encore or Southwire.

2.5 WIRE CONNECTIONS

A. Wire connections, #10 and smaller connections shall be made with insulated wire connectors with steel spring connector threads. Wire connectors shall be "Twister" Wire-Nut series as manufactured by Ideal Industries, Inc. or approved equal.

B. On wire larger than #10, shall be made with approved solderless connectors and covered with Scotch #33 electrical tape so that the insulation is equal to conductor insulation.

C. Connection of stranded conductors, #8 and larger, to bus bars in switchboards, panelboards, equipment enclosures, junction boxes, etc. shall be made with individual lugs, size as required by conductor, bolted to bus bar with full size bolts and nuts with lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION OF WIRE AND CABLE

A. No conductor shall be smaller than #12 except where designated on the drawings or hereinafter specified.

B. Multi-wire lighting branches shall be used as indicated.

C. All joints and splices in wire shall be made with approved solder-less connectors, and covered so that insulation is equal to the conductor insulation.

D. No splices shall be pulled into conduit.

E. Conductors and conduits shall be continuous between outlets.

F. No conductor shall be pulled until conduit is cleaned of all foreign matter.

G. Where installed in panelboards, cabinets, wireways, switches and equipment wire and cable shall be neatly formed and tied.

H. Where conductors are run in parallel, each conductor making up the feeder shall be exactly the same length, the same size, and the same type of conductor with the same insulation. Further, each group of conductors making up a phase or neutral must be bonded at both ends in the same manner.

I. In installing the main service, additional slack conductors shall be provided as required by the electric utility for connection to their equipment.

3.2 OUTLETS AND BRANCH CIRCUITS

A. Outlets shall be connected to branch circuits as indicated on drawings by circuit number adjacent to outlet symbols. No more outlets than are indicated shall be connected to a circuit.

B. All branch and feeder conductors shall have identification tag in all panelboards. Each tag shall have room name and circuit number which is serving.

3.3 WIRE AND CABLE COLOR CODING

A. A color coding system as listed below shall be followed throughout the entire network of branch circuits.

Voltage	120/240
Phase Color	Color
A	Black
B	Red
C	Blue
Neutral White	Gray
Ground	Green

B. Conductors sized #10 AWG and below shall have permanently colored insulation. Conductors sized #8 AWG and above shall be color coded by either permanently colored insulation or by means of colored tape applied to the conductor within 12" of each termination and in each enclosure, junction box, etc.

C. Control Conductors: Shall be color coded by use of color coded "tracers". No control circuit shall have two identical conductors.

END OF SECTION

SECTION 260520
NON-METALLIC SHEATHED CABLES (ROMEX)

PART 1 - GENERAL

1.1 SCOPE

A. This section deals with the materials to be used as non-metallic sheathed cable (ROMEX) and non-metallic service entrance cable (SE).

1.2 WHERE USED

A. Non-metallic sheathed cable (ROMEX) shall be permitted for branch circuits in Dwelling Units, where permitted by local code.

B. Non-Metallic sheathed cable shall not be utilized outside of the interior of dwelling units. Do not use to wire devices in canopies, roof etc.

C. Before installation of ROMEX cable, ensure building envelope is complete and building interior condition is completely dry where installation occurs. Should installed cabling be ordered to be removed and new wiring installed by local AHJ due to installation in wet/moist condition, such shall be done at the expense of the contractor.

PART 2 - PRODUCTS

2.1 NON-METALLIC SHEATHED CABLE (ROMEX)

A. Non-metallic sheathed cable (ROMEX), size #12 and #10 shall be solid with type TW insulation in a non-metallic sheath.

B. Non-metallic sheathed cable (ROMEX), conductors larger than #10 shall be stranded with type TW insulation in a non-metallic sheath.

C. All non-metallic sheathed cables shall be equipped with a separate, code size, grounding conductor which may be bare or green insulated.

2.2 MANUFACTURER

A. Romex cable shall be manufactured by Royal, Rome, Cerro, Carol, Triangle, General, American, Senator, Essex, Diamond or Southwire.

2.3 WIRE CONNECTIONS

A. On wire larger than #10, shall be made with approved solderless connectors and covered with Scotch #33 electrical tape so that the insulation is equal to conductor insulation.

B. Wire connections, #10 and smaller connections shall be made with insulated wire connectors with steel spring connector threads. Wire connectors shall be "Twister" Wire-Nut series as manufactured by Ideal Industries, Inc.

PART 3 - EXECUTION

A. General Use in Dwelling Units, where permitted by local code: #12 and #10 shall be solid with type TW insulation in a non-metallic sheathed cable (ROMEX). Conductors larger than #10 shall be stranded. All non-metallic

sheathed cables shall be equipped with a separate code sized grounding conductor which may be bare or green insulated.

3.1 INSTALLATION OF WIRE AND CABLE

A. No conductor shall be smaller than #12 except where so designated on the drawings or hereinafter specified.

B. All joints and splices in wire shall be made with approved solder-less connectors, and covered so that insulation is equal to the conductor insulation.

C. All splices shall be in approved boxes.

D. Conductors and conduits shall be continuous between outlets or junction boxes.

D. Where installed in panelboards, cabinets, wireways, switches and equipment wire and cable shall be neatly formed and tied.

E. Install only in dry conditions.

3.3 OUTLETS AND BRANCH CIRCUITS

A. Outlets shall be connected to branch circuits as indicated on drawings by circuit number adjacent to outlet symbols. No more outlets than are indicated shall be connected to a circuit.

3.4 WIRE COLOR CODING:

A. A color coding system as listed below shall be followed throughout the entire network of branch circuits.

Voltage	120/240
Phase	Color
A	Black
B	Blue
C	Red
Neutral	White
Ground	Green

B. Conductors sized #10 AWG and below shall have permanently colored insulation.

END OF SECTION

SECTION 260526
GROUNDING

PART 1 - GENERAL

1.1 SCOPE

A. This section deals with the grounding of service equipment, transformers, non-current carrying conductive surfaces of equipment, metal buildings, structures , cable tray, and other equipment.

B. All grounded connections shall be installed in accordance with the National Electrical Code and all local codes and requirements. Such codes shall be considered minimum requirements and installation of the grounding system shall insure freedom from dangerous shock voltage exposure and provide a low impedance ground fault path to permit operation of overcurrent and ground fault protection devices.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Grounding conductors shall be insulated copper unless specifically shown or specified otherwise.

B. Grounding conductors shall be identified by green insulation or by green tape.

C. All buried grounding system wire shall be bare, solid, soft-drawn, annealed, copper sized #2 AWG minimum, or as shown on drawings.

2.2 GROUND RODS

A. Ground rods shall be 5/8 inch by 10 feet, copperweld unless noted otherwise on the drawings.

2.3 CONNECTIONS

A. The connection of a grounding conductor to ground rods or building steel shall be by means of a cadweld.

B. Grounding conductor connections to conduit terminations shall be made with approved ground bushings.

PART 3 - EXECUTION

3.1 MAIN SERVICE GROUND

A. The main service shall have the grounded conductor (neutral) grounded to the grounding electrode system at the supply side of the service disconnecting means by a grounding electrode conductor not smaller than that shown in Table 250-66 of the NEC.

B. The grounded conductor (neutral), the grounding electrode conductor, and the equipment grounding conductor connections shall be made inside the service entrance equipment.

C. The equipment grounding conductor shall be connected to the grounded conductor on the supply side of the service disconnecting means in accordance with Table 250-66 of the NEC for the ampere rating of the service equipment. Where in a service entrance switchboard the equipment grounding conductor shall be connected to a bus bar rated not less than 25 percent of the main bus rating.

3.2 GROUNDING ELECTRODE SYSTEM

A. Shall consist of each of the following electrodes bonded together by the grounding electrode conductors:

1. An underground water main, if metal and in contact with earth for 10 feet or more, at the point of entry into the building.

   A full size copper conductor (same size as service ground conductor) jumper shall be installed around the water meter and any valve, pressure regulator, etc., which is within the building between the bonding point and the point of entry into the building and/or exterior to the building, above or below grade, on the project property.

2. The metal frame of the building.

3. Rebars in slab and footing.

4. Driven Ground Rods: 3-ground rods, spaced a minimum of 20 feet apart in a triangular pattern, shall be driven to 18" below grade and interconnected.

5. Other grounding electrodes if available shall be connected to the grounding electrode system as described in Section 250-50 of N.E.C.

B. An earth impedance tester shall be utilized to determine the actual resistance to ground. The maximum acceptable resistance to ground is 25 OHMS, if this value or less is not obtained, additional ground rods shall be driven and connected in parallel until an instrument reading of less than 25 OHMS is obtained. All test readings shall be recorded and submitted to the Engineer for review.

3.3 CADWELDING

A. Cadwelding shall be performed in strict accordance with the manufacturer's requirements.

B. All personnel performing cadwelding shall have been trained by factory certified representatives and proof of this training shall be presented to the Architect/ Engineer at the time of Cadweld inspection.

C. Cadwelding shall not be performed during conditions of high humidity which inhibit the process from proper bonding. Consult the Manufacturer's instructions for acceptable conditions and do not attempt any Cadwelding during such times as these conditions do not exist.

D. Cadweld molds shall be sized and configured for the specific welding application. Molds which have been field modified for application other than their original purpose will not be utilized under any circumstance. Cadweld "one shot" connections shall not be utilized.

E. In no circumstances will worn out or loose Cadweld molds be utilized. Molds which experience "blow out" during the welding process shall be replaced immediately and any welds made which exhibit evidence of incomplete welding shall be cut off and rewelded.

3.4 SEPARATELY DERIVED SYSTEMS

A. Separately derived systems (dry type transformers with primary and secondary electrically isolated and secondary having a grounded circuit neutral conductor) shall be grounded in accordance with NEC Section 250-30.

B. The grounding electrode shall be the nearest available effectively grounded structural member and the nearest available effectively grounded cold water pipe. Where the cold water bonding point is not the point of entry into the building, a #1/0 copper (min.) jumper shall be installed around any valve, pressure regulator, water meter, etc., which is within the building between the bonding point and the point of entry into the building.

3.5 EQUIPMENT GROUNDING

A. An equipment grounding conductor (sized in accordance with Table 250-122 of the N.E.C. unless shown or specified elsewhere to be larger) shall be installed in the same raceway with all circuit conductors.

B. Equipment grounding conductors shall be bonded at each enclosure and pole base. All equipment grounding conductors shall be connected to a common bus, bonded to the equipment enclosure or pole base.

C. An equipment grounding jumper shall be installed from the receptacle ground terminal to the outlet box where an equipment ground conductor is not installed in the conduit with the circuit conductors.

END OF SECTION 260526

SECTION 260532
RACEWAYS – NON-METALLIC

PART 1 - GENERAL

1.1 SCOPE

A. This section deals with the materials to be used as raceway where shown on the plans or specified as non-metallic conduit.

1.2 WHERE USED

A. Non-metallic conduit shall be used for auxiliary system service entrance, feeders and power service where below grade. Non-metallic conduit shall, however, convert to rigid metal conduit prior to leaving concrete in areas where conduit would be exposed. Conduit adapters shall be used for transitions. All elbows shall be rigid metal conduit.

PART 2 - PRODUCTS

2.1 COMPOSITION

A. Conduits and fittings shall be constructed of polyvinyl chloride compounds in accordance with the applicable requirements of UL, NEMA and the NEC.

2.2 SCHEDULE 40, RIGID PVC:

A. Shall be U.L. listed for use with 90 degrees C. rated conductors and in conformity with Article 347 of the NEC.

2.3 FITTINGS

A. All couplings, adapter, bells, reducers, etc., shall be of the same material and by the same manufacturer as conduit.

2.4 CEMENT

A. Solvent cement shall be as recommended by the manufacturer.

2.5 MANUFACTURER

A. The conduit manufacturer shall have had a minimum of 5 years experience in the manufacture of the products. Non-metallic conduit shall be as manufactured by Carlon, Queen City, Cantex or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All elbows, bends, etc., shall be either factory bends or made with an approved heat bender.

B. All cuts shall be made with an approved saw and ends deburred.

C. All joints shall be made as follows:

Clean the outside of the conduit to depth of the socket, and the inside of socket with an approved cleaner. Apply solvent cement to the interior of the socket and exterior of conduit, making sure to coat all surfaces to be joined. Insert conduit into the socket and rotate 1/4 to 1/2 turn and allow to dry.

D. No P.V.C. conduit shall be run exposed.

3.2 DUCT TYPE

A. Non-metallic conduit shall be Schedule 40 unless specifically noted otherwise.

3.3 CONCRETE ENCASEMENT

A. All non-metallic conduits installed below roads, driveways, parking areas or other areas subject to heavy traffic shall be concrete encased.

B. Non-metallic conduits shall be concrete encased where indicated on plans.

C. Concrete encasement shall be 3 inch minimum around all conduits.

3.4 GROUNDING

A. Where non-metallic conduit is to be installed as permitted in Section 1.02 an insulated ground wire shall be installed. Ground wire shall be "Code" sized as per NEC unless shown larger on the plans. Conduit shall be increased where required to meet Code fill requirements.

END OF SECTION 260532

SECTION 260533
RACEWAYS - METAL

PART 1 - GENERAL

1.1 SCOPE

A. This section deals with the materials to be used as metal raceways, connections, and supports.

PART 2 - PRODUCTS

A. Conduit: Rigid and IMC shall be galvanized outside and inside by hot dipping. EMT shall be Electro-Galvanized. Conduit shall be as manufactured by Republic, Wheatland, Triangle, Pittsburgh Standard, Youngstown, or Allied.

B. Sealtight flexible metal conduit shall consist of flexible galvanized steel tubing with a liquidtight jacket of PVC. All flexible conduit shall have a copper bonding conductor wound into conduit body.

C. Couplings and connectors on rigid and IMC shall be standard threaded type, galvanized outside and inside by hot dipping. Clamp type and threadless are not acceptable. Couplings and connectors, for rigid and IMC shall be as manufactured by Raco or Appleton.

D. EMT connectors shall be steel, set screw unless required by code to be compression type, equipped with insulating throats. Connectors couplings shall be O-Z/Gedney 7000ST or 7000RST series, T & B 5123 - 5623 series, Midwest Electric series 1650, or equal series of Raco. Cast metal couplings will not be approved for any location.

E. EMT couplings shall be steel, set screw unless required by code to be compression type. Couplings shall be O-Z/Gedney 6000S or 6000RS series, T & B 5120 - 5620 series, Midwest Electric series 660, or equal series of Raco. Cast metal connectors will not be approved for any location.

F. Connectors raintight: Meyers or approved equal.

G. Bushings on rigid and IMC shall be threaded malleable iron with integral noncombustible insulator. Rigid and IMC bushings shall be O-Z/Gedney "IBC" series, T & B BIM series, Midwest Electric series 1031 - 1043 or equal by Penn Union. Grounding bushings shall be O-Z/Gedney "IBC-L" series, T & B 3870 - 3999 series, Midwest Electric GLL series or equal by Penn Union.

H. Watertight Flex Connectors: O-Z/Gedney, Raco, or Midwest Electric with insulating throat.

I. Conduit clamps and supports shall be as manufactured by T & B, Midwest Electric, or O-Z/Gedney.

J. Conduit fittings shall be manufactured by Pyle-National, Appleton, Crouse-Hinds, or Russellstoll.

K. Finished metal raceway shall be Wiremold 4000G series.

L. Finished metal raceway shall be Wiremold 2000V series.

M. Finished none metallic raceway shall be Wiremold 2900 series.

N. Finished none metallic raceway shall be Wiremold 2800 series.

PART 3 - EXECUTION

3.1 CONDUIT, TYPE OF INSTALLATION

A. EMT conduit with set screw shall be used for all branch circuits, power feeders, auxiliary, signaling and controls circuits in none hazardous dry locations. EMT may be used exposed where not subject to physical damage. EMT with compression fitting may be used in damp locations. Otherwise use rigid or intermediate hot dipped galvanized inside and out steel, threaded for screwed fitting only conduits unless specified on the drawings otherwise.

B. Contractor may use MC cable in lieu of EMT where permitted by NEC, IBC and local code

3.2 INSTALLATION OF CONDUIT EMT, IMC, RIGID

A. Conduits shall be sized in accordance with the latest National Electrical Code.

B. Follow methods which are appropriate and approved for the location and conditions involved. Where not otherwise shown, specified, or approved in a particular case, run all wiring concealed.

C. Where rigid and/or IMC conduits enter boxes they shall be secured in place by approved locknuts and bushing.

D. Where EMT enters boxes they shall be secured in place with approved insulating fittings.

E. Conduit ends shall be plugged during construction.

F. The use of running threads is absolutely prohibited. All conduit shall be jointed with approved conduit couplings. All couplings on IMC and rigid conduit shall be threaded.

G. 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 crossing is unavoidable, then conduit shall be kept at least 3" from the covering of the pipe crossed.

H. Before installing raceways for motors and fixed appliances, check location of motor and appliances connections to locate and arrange raceways appropriately. Provide flexible conduit connections to all motors and/or any equipment which has moving or vibrating parts. Flexible conduit shall generally not exceed 24" in length and shall in all cases be equipped with a ground wire, bonded at both ends. Sealtight flexible conduit shall be used in all areas exposed to moisture.

I. Exposed conduit runs shall be run parallel and/or right angles to building walls and/or partitions.

J. Fasten conduit securely in place by means of approved conduit clamps, hangers, supports and fastenings. Arrangement and methods of fastening all conduits shall be subject to Architect/Engineer's direction and approval. Galvanized wire may be used only on concealed conduit. Use only approved clamps on exposed conduit.

K. All conduits shall be supported within 3 feet of each coupling, fitting, outlet box, junction box, cabinet or equipment enclosure Conduit supports shall be independent of ducts, plumbing piping, ceiling supports, etc. Conduits shall not be supported by junction boxes, pull boxes, fixtures, etc.

L. Multiple conduit runs shall be supported by trapeze hangers, run tight against the ceiling.

M. All conduit connections to sheet metal cabinets or enclosures subject to the elements shall terminate by use of raintight hubs.

N. All exposed conduit threads, metal supports, etc., exposed to the elements or exterior of building shall be painted with rust preventive paint.

O. A 100 pound test nylon pull cord shall be installed in each empty conduit.

P. Apply two coats of asphaltum paint to all underground metallic conduit. Carefully retouch any breaks in paint and allow to dry before covering with earth. Leave exposed until after Architect/ Engineer's inspection. Pittsburgh Standard Rob-Kote may be used in lieu of painting.

Q. No conduit with an external diameter larger than 1/3 the thickness of the slab, shall be placed in the slab and conduits in the slab shall not be spaced closer than 3 diameters on center.

R. No conduit shall be run in slag or fill under the ground floor slab. Where running in the slab is not permissible, conduits shall be run in trenches, 18" minimum, below grade and backfilled.

S. Any conduit stubbed out for future shall be capped and marked with a 2" minimum red metal tag which identifies conduit origin. Conduits stubbed up above grade or roof shall be tagged on the conduit. Conduits stubbed out below grade shall be tagged on nearest building wall, curb, etc., directly over the conduit run.

T. Conduit in riser shafts shall be supported at each floor level by approved "U" clamp hangers.

U. Where conduit crosses a structural expansion joint an approved conduit expansion fitting will be installed.

V. Where hazardous locations must be entered or penetrated, rigid steel conduit, explosion proof junction boxes, fittings and hardware shall be installed in accordance with Articles 500 through 503 and other pertinent sections of the NEC, applicable Standards or Sections of NFPA and any other codes or regulations as required by the local Authority having jurisdiction. Explosion proof seal-off fittings shall be the first exposed fittings on both ends of any conduit penetration of a hazardous area. Seal-off fittings shall be installed in strict accordance with the manufacturer's instructions and shall be packed and sealed with the manufacturer's recommended sealing compound(s), as required to obtain full Code compliance.

END OF SECTION

SECTION 260534

OUTLET AND JUNCTION BOXES

PART 1 - GENERAL

1.1 SCOPE

A. This section outlines the quality, type and installation of outlet and junction boxes for general and special use.

PART 2 - PRODUCTS

2.1 WALL OUTLET BOXES

A. Shall be standard type, with knockouts, made of hot dipped galvanized steel, Steel City, Raco, Appleton, or Bowers.

B. Ceiling outlet boxes shall be 4" octagon 1-1/2" deep or larger as required due to number of wires.

C. Boxes shall be provided with approved 3/8" fixture studs when required to support stem mounted light fixtures.

D. Except when located in exposed concrete block, switch and receptacle boxes shall be 4" square with trim ring for single gang installation. Appropriate gang boxes shall be used for mounting ganged switches.

E. When installed in exposed concrete block, switch and receptacle boxes shall be square type designed for exposed block installation.

F. When installed exposed in finished area switch, receptacle telephone and data. Etc., outlet boxes shall be Wiremold 2100 series.

G. When installed exposed in finished area receptacle, telephone and data shall be installed at base in finished metal raceway Wiremold 4000 series.

2.2 CAST METAL DEVICE BOXES

A. General

1. Rugged continuous and seamless cast construction to prevent entry of dirt, dust, and moisture.

B. For sealing boxes installed recessed

1. Where device boxes are recessed mounted, the box to the adjacent wall, ceiling, or floor surface shall be sealed. Once wiring is installed, the wiring shall be surrounded by a one inch barrier of silicone caulking around the conductors within the device box hub. Gasketed device cover plates shall be used, with an additional continuous bead of silicone caulk between the device plate and the adjacent wall, ceiling, or floor surface.

C. For sealing boxes installed exposed

1. Where device boxes and conduits are surface mounted, and where the device box meets the wall, ceiling, or floor surface, a continuous bead of silicone caulk shall be provided.

2.3 PULL AND JUNCTION BOXES

A. General

1. NEMA type and size as required by area or as shown, complete with matching cover. Where necessary, gaskets shall be used to prevent entrance of moisture.

2.4 FLOOR OUTLETS

A. See drawings.

2.5 JUNCTION BOXES

A. Sheet metal junction boxes, through 4-11/16", shall be standard type of hot dipped galvanized steel, with knockouts, Steel City, Raco, Appleton, Bowers or approved equal.

B. Cast metal junction boxes, through 4-11/16", shall be type FS, FD, JB, GS, or SEH as required for application.

C. Sheet metal junction boxes larger than 4-11/16" shall be NEMA 1, Code gauge steel, flush or surface mounted as indicated and shall be Hoffman or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION OF WALL OUTLET BOXES

A. Outlet boxes shall be securely fastened to structural members and shall not be supported by dry wall, gypsum board, plaster, etc. The device or plate installed in conjunction with the outlet box shall not be used for support.

B. Surface fixture outlet boxes shall be set so edge of cover comes flush with finished surface.

C. There shall be no more knockouts opened in any outlet box than are actually required.

D. Boxes shall be sealed during construction.

E. Under no circumstances shall through-the-wall boxes be used. Back to back boxes shall be staggered at least 3 inches, except in fire rated partitions, in which case, back to back boxes shall be staggered at least 24 inches.

F. Outlet boxes two gangs and wider shall not be supported by attachment clips or any means which supports the boxes from less than two opposite sides of the box. Such outlet boxes in stud walls shall be supported securely by support members spanning between studs.

G. Outlet boxes installed in fire rated partitions shall be boxed in with wall board or other suitable fire rated material as required to maintain or restore the fire rating of the assembly.

3.2 INSTALLATION OF FLOOR OUTLET BOXES

A. Floor outlet boxes to be imbedded in concrete shall be properly leveled and anchored in place before the concrete is poured.

B. Floor outlet boxes shall be set so edge of cover comes flush with finished floor surface.

C. There shall be no more knockouts opened in any outlet box than are actually required.

D. Boxes shall be sealed during construction.

3.3 INSTALLATION OF JUNCTION BOXES

A. Provide junction or pull boxes where shown on the drawings and as required to facilitate installing conductors. Such boxes shall be "Code" sized unless required to be larger by the plans or other sections of these specifications. All junction boxes shall be accessible.

B. Junction boxes shall be securely fastened to the building structure independent of ductwork, plumbing, etc. Junction boxes shall not be supported by EMT conduit fittings.

C. There shall not be more knockouts opened in any box than are actually required.

D. Boxes shall be properly protected during construction and shall be cleaned of all foreign matter before conductors are installed.

E. Boxes to be imbedded in concrete shall be properly leveled and anchored in place before the concrete is poured.

END OF SECTION 260534

SECTION 260544

SLEEVES AND SLEEVES SEALS FOR ELECTRICAL RADEWAYS AND CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. Sleeves for Rectangular Openings:

1. Material: Galvanized sheet steel.
2. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
b. For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements, provide products by the following

a. Advance Products & Systems, Inc.
b. CALPICO, Inc.
c. Metraflex Company (The).
d. Pipeline Seal and Insulator, Inc.
e. Proco Products, Inc.

2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Stainless steel.
4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

1. Manufacturers: Subject to compliance with requirements, provide products by the following

a. Presealed Systems.

2.4 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C 117/C 117M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
2. Sealant shall have VOC content according to 40 CFR 59, Subpart D (EPA Method 24).

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 7 Section "Joint Sealants."
b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed or unless seismic criteria require different clearance.
4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches (50 mm) 6 inch above finished floor level. Install sleeves during erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position water stop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION

SECTION 262418
LOAD CENTERS

PART 1 - GENERAL

1.1 SCOPE

A. This section outlines the requirements for circuit breaker load centers.

B. Load centers shall be dead front type, manufactured in accordance with Underwriter's Laboratories, Inc., standard of panelboards and enclosing cabinets, and be so labeled.

PART 2 - PRODUCTS

2.1 LOAD CENTER ENCLOSURES

A. Load centers shall be fabricated from sheet steel and equipped with a hinged door with a catch. A circuit directory card shall be provided on the inside of the door.

2.2 LOAD CENTER BUSSING

A. Load center bus ampacity, service voltage, service entrance (main breakers or lugs) and branch breakers shall be as shown on the drawings. All bus connections shall be tin plated.

B. Main lugs shall be mechanical type.

C. Branch circuit breakers shall be connected to the bus in a distributed phase arrangement. Breakers shall not be held in place by trim.

D. Neutral bars shall be full sized and equipped with lugs to accommodate all conductors to be connected.

E. Ground bars shall be furnished in all load centers.

2.3 CIRCUIT BREAKERS

A. Branch circuit protective devices shall be 50 ampere frame, quick-lag, quick-make, quick-break, plug-in type thermal magnetic circuit breakers for alternating current. Automatic tripping shall be indicated by the handle assuming a position between manual "OFF" and "ON" positions.

B. Multi-pole circuit breakers shall be single handle common trip type rated for 240 volts, A.C. External handle ties of any type will not be accepted.

C. Where noted on the panelboard schedule or on the plans, UL Class A (5 milliampere sensitivity) ground fault circuit protection breakers shall be provided. Ground fault protection shall be an integral part of the breaker in addition to the protection specified above. The addition of ground fault protection to the molded case breaker shall not require additional panelboard space.

D. All circuit breakers shall be arc fault type circuit breaker.

2.4 CIRCUIT BREAKER ARRANGEMENTS

A. Breakers shall be arranged so that the entire left row is filled then begin top right.

B. Breakers shall be numbered vertically beginning top left. Breaker numbers shall be metallic, permanently attached to trim.

2.5 MANUFACTURER

A. Load Centers shall be as manufactured by Siemens, Square "D", GE, Cutler Hammer, or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All load center dimensions shall be carefully checked and coordinated with the proper trades to ensure proper mounting space and support.

B. Where existing load centers are mounted on plywood backboards the backboards shall be extended as required to mount the new panels. Plywood backboards shall be painted with two coats of fire retardant paint prior to installation.

C. Wiring in load center gutters shall be done in a neat and workmanlike manner. Wiring shall be grouped into neat bundles and secured with approved non-metallic tie wraps.

END OF SECTION

SECTION 262726
WIRING DEVICES

PART 1 - GENERAL

1.1 SCOPE

A. This section outlines the quality and requirements of the Basic Devices, switches, receptacles, etc., to be used and the installation instructions for the devices.

PART 2 - PRODUCTS

2.1 WIRING DEVICES

A. Switches shall be residential grade, AC type, in NEMA configuration as shown on drawings. Switches and receptacles shall be as manufactured by Arrow Hart, Hubbell, Leviton, or P & S.

B. Switches shall be silent operation toggle, rated 20 amperes, 120/277 volt AC, Hubbell Catalog # 1121 or equal.

C. Switches installed in door or window frames, or in other space limited areas, shall be narrow type as manufactured by Arrow Hart. Narrow switches shall be Series QT90/T-1600, rated 20 ampere, in configuration as shown on drawings.

D. Receptacles shall be side wired, residential grade, in NEMA configuration as shown on drawings.

E. Where noted on the drawings, and/or required by code, receptacles shall be equipped with integral Class A ground fault protection (5 milliampere sensitivity). Unless noted otherwise all "GFI" receptacles shall be duplex, rated 20 amperes, 120 volts with "TEST" and "RESET" buttons and feed through feature for ground fault protection of all devices on the load side of the unit.

2.2 PLATES AND ACCESSORIES

A. All devices shall have proper plates, trim, etc.

B. Plates shall be plastic except where other-wise specified or noted on the drawings. Color to be selected by architect/owner.

D. Where required to be weatherproof, cover plates shall be high impact polycarbonate in-used type with gray finish. See legend on drawings for more information.

E. Surface mounted devices with exposed conduit in unfinished areas shall have galvanized metal plates with rounded or beveled edges.

2.3 FINISHES

A. Switches and receptacles served by the normal power system shall be white with white cover plates. Verify finished with architect/owner.

B. Switches and receptacles served by the emergency power system shall be red with white cover plates. Verify cove plate finish with architect/owner.

PART 3 - EXECUTION

3.1 MOUNTING HEIGHTS AND LOCATIONS

A. Symbols on drawings and mounting heights are approximate. Exact locations and mounting heights shall be determined on the job and it shall be the Contractor's responsibility to coordinate with all trades to ensure correct installation, i.e., over counters in or above back-splashes, in block walls, tile, and other specific construction features.

B. Outlets, unless otherwise shown shall be located with the center line of outlet boxes the following distance above the finished floor:

Receptacles, General:	1'-6"
Telephone Outlets:	1'-6"
Receptacles Over Counters:	3'-8" (Verify with architect)
Switches, General:	3'-10"
Audio visual:	6'-8" (to the bottom of device)
Visual:	6'-8" (to the bottom of device)
Pull Stations:	3'-10"

C. All device mounting heights shall be in accordance with the Americans with Disabilities Act and all Federal, State, and Local requirements for making buildings accessible to the handicapped. Contractor shall verify mounting height of devices with architect before rough in, no exception.

3.2 GENERAL MOUNTING

A. Verify all door swings with Architectural. Locate boxes for light switches within 4 inches of door trim on the strike side.

B. Where switches are shown grouped together they shall be installed under a single plate. Where required, barriers shall be provided in the outlet box.

C. Where receptacles, telephone outlets, and auxiliary system outlets are shown on the drawings grouped together they shall be installed with 4 inches between outlets.

D. All receptacles within 6'- 0" of sinks, showers or normally wet or damp locations shall be equipped with ground fault protection.

E. Devices and associated plates shall not be used as support. Outlet boxes shall be rigidly supported from structural members.

F. Receptacles shall be mounted so that the ground slot will be on top.

END OF SECTION

SECTION 262813
FUSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Cartridge fuses rated 240-V ac and less for use in control circuits and enclosed switches
2. Plug fuses rated 125-V ac and less for use in plug-fuse-type enclosed switches and fuse holders.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material, dimensions, descriptions of individual components, and finishes for spare-fuse cabinets. Include the following for each fuse type indicated:

1. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
2. Current-limitation curves for fuses with current-limiting characteristics.
3. Coordination charts and tables and related data.

B. Operation and Maintenance Data: For fuses to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section "Operation and Maintenance Data," include the following:

1. Ambient temperature adjustment information.
2. Current-limitation curves for fuses with current-limiting characteristics.
3. Coordination charts and tables and related data.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NEMA FU 1 for cartridge fuses.

D. Comply with NFPA 70.

E. Comply with UL 248-11 for plug fuses.

1.5 COORDINATION

A. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

1.6 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper Bussmann, Inc.
2. Edison Fuse, Inc.
3. Ferraz Shawmut, Inc.
4. Littelfuse, Inc.

2.2 FUSES

A. Characteristics: renewable cartridge fuses with voltage ratings consistent with circuit voltages.

2.3 PLUG FUSES

A. Characteristics: UL 248-11, nonrenewable plug fuses; 125-V ac.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.

B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.

C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.

D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

A. Cartridge Fuses:

1. Motor Branch Circuits: Class RK1 time delay.
2. Other Branch Circuits: Class RK1, time delay.
3. Control Circuits: Class CC, time delay.

3.3 INSTALLATION

A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

B. Install plug-fuse adapters in Edison-base fuseholders and sockets. Ensure that adapters are irremovable once installed.

C. Install spare-fuse cabinet(s).

END OF SECTION

SECTION 262816
SAFETY SWITCHES

PART 1 - GENERAL

1.1 SCOPE

A. This section deals with safety switches fused and non-fused. All safety switches shall be NEMA Heavy duty type.

1.2 SERVICE RATING

A. Where required, safety switches shall be labeled for use as service entrance equipment.

PART 2 - PRODUCTS

2.1 SAFETY SWITCHES

A. Shall be quick-make, quick-break, fused or non-fused as shown. Switch blades shall be fully visible in the off position with the door open. The switch handle shall be a part of the box, not the cover.

B. Fusible switches shall have provisions for dual element fuses, UL Class K-5.

C. Switch cover shall have a defeatable dual interlock to prevent inadvertent opening of the cover with the switch in the "ON" position. Provisions shall be made for padlocking in the "OFF" position.

D. Switches shall be horsepower rated.

2.2 MANUFACTURER

A. Switches shall be as manufactured by GE, Square D, cutler hammer, Siemens or approved equal.

PART 3 - EXECUTION

3.1 SAFETY SWITCHES

A. Safety switches shall be installed as shown on the drawings and in accordance with the N.E.C.

B. Disconnect switches for motors shall be rated in horsepower and shall be sized for motor served.

C. Disconnect switches for non-motor loads shall be sized in accordance with equipment full load current.

D. Safety switches shall be NEMA I enclosure except where installed in locations subject to moisture, in which case, safety switches shall have a raintight enclosure, NEMA 3R, except where other types of enclosures are shown on the drawings.

E. Adequate support shall be provided for mounting safety switches. Safety switches shall be securely attached to building structure in all possible instances.

END OF SECTION

SECTION 26 5100
INTERIOR LIGHTING
PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:

1. Interior lighting fixtures, lamps, and ballasts.
2. Emergency lighting units.
3. Exit signs.
4. Lighting fixture supports.
5. Retrofit kits for fluorescent lighting fixtures.

B. Energy Compliance

1. Lamp and ballast as a system shall compliance with ASHRAE/IESNA 90.1-2009.

1.03 DEFINITIONS

A. BF: Ballast factor.

B. CCT: Correlated color temperature.

C. CRI: Color-rendering index.

D. HID: High-intensity discharge.

E. LER: Luminaire efficacy rating.

F. Lumen: Measured output of lamp and luminaire, or both.

G. Luminaire: Complete lighting fixture, including ballast housing if provided.

1.04 SUBMITTALS

A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:

1. Physical description of lighting fixture including dimensions.
2. Emergency lighting units including battery and charger.
3. Ballast, including BF.
4. Energy-efficiency data.
5. Life, output (lumens, CCT, and CRI), and energy-efficiency data for lamps.
6. Photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing & Calculation Guides, of each lighting fixture type. The adjustment factors shall

be for lamps, ballasts, and accessories identical to those indicated for the lighting fixture as applied in this Project.

a. Manufacturer Certified Data: Photometric data shall be certified by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.

B. Installation instructions.

C. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Lighting fixtures.
2. Suspended ceiling components.
3. Partitions and millwork that penetrate the ceiling or extends to within 12 inches (305 mm) of the plane of the luminaires.
4. Ceiling-mounted projectors.
5. Structural members to which suspension systems for lighting fixtures will be attached.
6. Other items in finished ceiling including the following:

a. Air outlets and inlets.
b. Speakers.
c. Sprinklers.
d. Smoke and fire detectors.
e. Occupancy sensors.
f. Access panels.

7. Perimeter moldings.

D. Qualification Data: For qualified agencies providing photometric data for lighting fixtures.

E. Product Certificates: For each type of ballast for bi-level and dimmer-controlled fixtures, from manufacturer.

F. Field quality-control reports.

G. Operation and Maintenance Data: For lighting equipment and fixtures to include in emergency, operation, and maintenance manuals.

1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

H. Warranty: Sample of special warranty.

1.05 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NFPA 70.

1.06 COORDINATION

A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

1.07 WARRANTY

A. Special Warranty for Emergency Lighting Batteries: Manufacturer's standard form in which manufacturer of battery-powered emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in materials or workmanship within specified warranty period.

1. Warranty Period for Emergency Lighting Unit Batteries: 5 years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for the remaining nine years.
2. Warranty Period for Emergency Fluorescent Ballast and Self-Powered Exit Sign Batteries: Five years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for the remaining six years.

1.08 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps: 10 for every 100 of each type and rating installed. Furnish at least one of each type.
2. Plastic Diffusers and Lenses: One for every 100 of each type and rating installed. Furnish at least one of each type.
3. Emergency battery pack: One for every 20 emergency lighting unit.
4. Ballasts: One for every 100 of each type and rating installed. Furnish at least one of each type.
5. Globes and Guards: One for every 20 of each type and rating installed. Furnish at least one of each type.

1.09 SPECIAL REQUIREMENTS

A. All lighting fixtures shall be purchased from local manufacturer representative and local distributors which are located within 50 mile of project site, no exception.

1.10 QUICK DISCONNECT

A. All light fixtures shall be provided with quick disconnect.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide product indicated on Drawings. The following manufacturer shall provide pre-bid submittals for approval if their products not specified on lighting fixture schedule on drawings:

Acuity Brand, Philips, Cooper and Hubbell

2.02 GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS

A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.

B. Incandescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5A.

C. Fluorescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.

D. LED Fixtures: Comply with UL 1598, Title 24-2008, IECC 2009, IES LM-79 and LM-80. Light fixture shall be designed for LED technology with two stage reflector system and frosted les at the upper reflector producing smooth distribution with excellent light control and low aperture brightness.

E. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.

F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

G. Diffusers and Globes:

1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

   a. Lens Thickness: At least 0.125 inch (3.175 mm) minimum unless otherwise indicated.
   b. UV stabilized.

2. Glass: Annealed crystal glass unless otherwise indicated.

H. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

2.03 LED DRIVER

A. Driver shall be accessible for service from above and through the aperture. Driver shall have minimum of replacement warranty of 5 years.
1.).
   a. .

2.04 LED LAMPS

B. LED lamps: IES LM-79 CRI 80 (minimum) color temperature 4100K, and rated life of 50,000 hours, minimum at 70% lumens maintenance, Auto resetting, thermally protected. LED should turned off when safe operating temperatures are exceeded. Color variation within 3-step MacAdam ellipses.

C. LED down lights shall meet part “A” above requirement and shall be equipped with dimmable drivers.

D. Comply with ANSI C82.1, IES LM-79 and LM-80, 5 years minimum lamp and driver replacement warranty.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Lighting fixtures:

1. Set level, plumb, and square with ceilings and walls unless otherwise indicated.
2. Install lamps in each luminaire.

B. Temporary Lighting: If it is necessary, and approved by Architect, to use permanent luminaires for temporary lighting, install and energize the minimum number of luminaires necessary. When construction is sufficiently complete, remove the temporary luminaires, disassemble, clean thoroughly, install new lamps, and reinstall.

C. Remote Mounting of Ballasts: Distance between the ballast and fixture shall not exceed that recommended by ballast manufacturer. Verify, with ballast manufacturers, maximum distance between ballast and luminaire.

D. Lay-in Ceiling Lighting Fixtures Supports: Use grid as a support element.

1. Install ceiling support system rods or wires, independent of the ceiling suspension devices, for each fixture. Support fixture from structure from all four corners.
2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.
4. Install at least one independent support rod or wire from structure to a tab on lighting fixture. Wire or rod shall have breaking strength of the weight of fixture at a safety factor of 3.

E. Suspended Lighting Fixture Support:

1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.
2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
4. Do not use grid as support for pendant luminaires. Connect support wires or rods to building structure.

F. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.02 IDENTIFICATION

A. Install labels with panel and circuit numbers on concealed junction and outlet boxes. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.03 FIELD QUALITY CONTROL

A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.04 STARTUP SERVICE

A. Burn-in all lamps that require specific aging period to operate properly, prior to occupancy by Owner. Burn-in fluorescent and compact fluorescent lamps intended to be dimmed, for at least 100 hours at full voltage.

3.05 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting aimable luminaires to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose. Some of this work may be required after dark.

END OF SECTION

SECTION 28 3111
DIGITAL FIRE-ALARM SYSTEM
PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:

1. Fire-alarm control unit.
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. Non-system smoke detectors.
5. Heat detectors.
6. Notification appliances.
7. Magnetic door holders.
8. Remote annunciator.
9. Addressable interface device.
10. Digital alarm communicator transmitter.
11. Pre-Action System

1.03 DEFINITIONS

A. LED: Light-emitting diode.

B. NICET: National Institute for Certification in Engineering Technologies.

1.04 SYSTEM DESCRIPTION

A. Noncoded, UL-certified addressable networkable system, with multiplexed signal transmission, dedicated to fire-alarm service ONLY. System shall be capable of walk test.

1.05 SUBMITTALS

A. General Submittal Requirements:

1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
2. Shop Drawings shall be prepared by persons with the following qualifications:

a. Trained and certified by manufacturer in fire-alarm system design.
b. NICET-certified fire-alarm technician, Level III minimum.
c. Licensed or certified by authorities having jurisdiction.

B. Product Data: For each type of product indicated.

C. Shop Drawings: For fire-alarm system. Include plans, elevations, sections, details, and attachments to other work.

1. Comply with recommendations in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72.
2. Include voltage drop calculations for notification appliance circuits.
3. Include battery-size calculations.
4. Include performance parameters and installation details for each detector, verifying that each detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
5. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale and coordinating installation of duct smoke detectors and access to them. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators. Locate detectors according to manufacturer's written recommendations.
6. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits.

D. Delegated-Design Submittal: For smoke and heat detectors indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Drawings showing the location of each smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the detector.
2. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72.

E. Qualification Data: For qualified Installer.

F. Field quality-control reports.

G. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section "Operation and Maintenance Data," include the following:

1. Comply with the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
2. Provide "Record of Completion Documents" according to NFPA 72 article "Permanent Records" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter.
3. Record copy of site-specific software.
4. Provide "Maintenance, Inspection and Testing Records" according to NFPA 72 article of the same name and include the following:

    a. Frequency of testing of installed components.
    b. Frequency of inspection of installed components.
    c. Requirements and recommendations related to results of maintenance.
    d. Manufacturer's user training manuals.

5. Manufacturer's required maintenance related to system warranty requirements.
6. Abbreviated operating instructions for mounting at fire-alarm control unit.
7. Copy of NFPA 25.

1.06 QUALITY ASSURANCE

A. Codes, Standards, Ordinances, and Permits

1. All work shall comply with the codes adopted and enforced by the following agencies:

    a. State Fire Marshal's Office (Adopted Volumes of National Fire Protection Association (NFPA) National Fire Codes)

        1) NFPA 72, National Fire Alarm Code 2013 Edition
        2) NFPA 101, Life Safety Code, 2013 Edition

    b. Birmingham Fire and Rescue Service

        1) International Fire Code, 2015 Edition, and referenced standards

        2) All work and products shall also conform to the following nationally recognized standards:

            1. ANSI S3.41, Audible Emergency Evacuation Signal, 1996.

            2. UL 864, Control Units for Fire Protective Signaling Systems, 9th Edition, 2003.

            3. UL 1481, Power Supplies for Fire Protective Signaling Systems, 5th Edition, 2006.

            4. UL 268, Smoke Detectors for Fire Protection Signaling Systems, 5th Edition, 2006.

            5. UL 1971, Signaling Devices for the Hearing Impaired, 3rd Edition, 2002.

            6. UL 1480, Speakers for Fire Protective Signaling Systems, 5th Edition, 2003.

        3) All work and materials shall conform to all Federal, State and local codes and regulations governing the installation, including the current editions of the International Building and Fire Codes, and the codes, standards, guides and recommended practices included in the 2003 NFPA National Fire Codes.

        4) If there is a conflict between the referenced NFPA standards, federal, state or local codes, and this specification, it is the Contractor's responsibility to immediately bring the conflict to the attention of the Owner for resolution. Where conflict arises between the *International Fire Code* and NFPA 101, *Life Safety Code*, the most stringent code requirement will be enforced.

        5) All devices, appliances, systems, equipment and materials furnished and installed shall be new and listed by Underwriters Laboratories Inc. (UL) for their intended use. All equipment shall be installed in accordance with the manufacturer's recommendations and the UL listing limitations. Listing requirements for separate fire alarm systems, and smoke detectors shall be met. The Contractor shall provide evidence with his submittal of listings for all proposed equipment and combinations of equipment.

        6) All devices, appliances, systems, equipment and materials furnished and installed shall be of types or models approved and required by NFPA Standards or UL listing for use in systems and occupancies of this type.

        7) The Contractor shall be responsible for filing of all documents, paying all fees (including, but not limited to plan checking and permit) and securing all permits, inspections and approvals necessary for conducting this work. Upon receipt of approved drawings from the Authority Having Jurisdiction, the Contractor shall immediately forward two sets of drawings to the Owner. These drawings shall either be stamped approved or a copy of the letter stating approval shall be included.

8) The contractor must have a NICET Level III Technician in a position of responsibility and the license shall be issued in the name of the certificate holder and the contractor. The Certified Fire Alarm Act also requires that technicians working for the Certified Contractor must hold a current NICET Level II, or equivalent, certification. The contractor shall show evidence at the pre-bid conference that he/she meets the certification requirements of the Act and holds a permit issued by the State Fire Marshall.

B. Contractor Qualifications

The Contractor shall:

1. Provide a job site supervisor/foreman who is to be present on site each day that work is actively in progress, as appropriate. The jobsite supervisor/foreman shall be a minimum National Institute for Certification in Engineering Technologies (NICET) Level II in Fire Alarm Systems. A daily site visit is required as a minimum. This individual shall be the same person throughout the course of the project, unless otherwise approved in writing by the Owner.

2. System configuration, installation, programming and testing shall be supervised by a NICET Level III or IV in Fire Alarm Systems, trained by the Contractor.

3. Hold all licenses and permits necessary to perform this work.

4. Have at least five years of experience in the installation of systems of this type and shall be familiar with all applicable local, state, and federal laws and regulations. Provide a project list representing projects of similar scope in the past three years including references.

5. Be regularly engaged in the design, servicing, installation, and testing of fire detection and alarm systems.

6. Installation shall be by personnel certified by NICET as fire- alarm Level III technician. The State of Alabama Certified Fire Alarm Act requires that every business who installs fire alarm systems in commercial occupancies must be licensed as a Certified Fire Alarm Contractor. The contractor must have a NICET Level III Technician in a position of responsibility, and the license will be issued in the name of the certificate holder and the contractor. The Certified Fire Alarm Act also requires that technicians working for the Certified Contractor must hold a current NICET Level II, or equivalent, certification. The fire alarm specifications shall require contractors wishing to bid on fire alarm work to show evidence at the pre-bid conference that he/she meets the certification requirements of the Act and holds a permit issued by the State Fire Marshall.

1.07 SOFTWARE SERVICE AGREEMENT

A. Comply with UL 864.

B. Technical Support: Beginning with Substantial Completion, provide software support for two years.

C. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.

1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

1.08 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps for Remote Indicating Lamp Units: Quantity equal to 10 percent of amount installed, but no fewer than 1 unit.
2. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no fewer than 1 unit.
3. Smoke Detectors, Fire Detectors: Quantity equal to 10 percent of amount of each type installed, but no fewer than 1 unit of each type.
4. Detector Bases: Quantity equal to 2 percent of amount of each type installed, but no fewer than 1 unit of each type.
5. Keys and Tools: One extra set for access to locked and tamper proofed components.
6. Audible and Visual Notification Appliances: One of each type installed.
7. Fuses: Two of each type installed in the system.

1.09 Fire Alarm System Listing

A. Fire alarm system shall be UL listed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, as shown on drawings and specified here.

B. Product: Shall be by Simplex, FireLite, or SilentKnight. Where FireLite or SilentKnight systems are provided existing fire alarm system shall be replaced with new to meet code as part of this contract. Provide cost in bid and pricing.

2.02 SYSTEMS OPERATIONAL DESCRIPTION

A. Fire-alarm signal initiation shall be by one or more of the following devices and systems:

1. Manual stations.
2. Heat detectors.
3. Flame detectors.
4. Smoke detectors.
5. Duct smoke detectors.
6. Verified automatic alarm operation of smoke detectors.
7. Automatic sprinkler system water flow.
8. Heat detectors in elevator shaft and pit.

B. Fire-alarm signal shall initiate the following actions:

1. Continuously operate alarm notification appliances.
2. Identify alarm at fire-alarm control unit and remote annunciators.
3. Transmit an alarm signal to the remote alarm receiving station.
4. Unlock electric door locks in designated egress paths.
5. Release fire and smoke doors held open by magnetic door holders.

6. Switch heating, ventilating, and air-conditioning equipment controls to fire-alarm mode, Close smoke dampers in air ducts of designated air-conditioning duct systems.
7. Recall elevators to primary or alternate recall floors.
8. Record events in the system memory.
9. Record events by the system printer.
10. Send fire alarm system condition to Remote Monitoring Receiving Station.

C. Supervisory signal initiation shall be by one or more of the following devices and actions:

1. Valve supervisory switch.
2. Elevator shunt-trip supervision.

D. System trouble signal initiation shall be by one or more of the following devices and actions:

1. Open circuits, shorts, and grounds in designated circuits.
2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
3. Loss of primary power at fire-alarm control unit.
4. Ground or a single break in fire-alarm control unit internal circuits.
5. Abnormal ac voltage at fire-alarm control unit.
6. Break in standby battery circuitry.
7. Failure of battery charging.
8. Abnormal position of any switch at fire-alarm control unit or annunciator.
9. Low-air-pressure switch operation on a dry-pipe or pre-action system.

E. System Trouble and Supervisory Signal Actions: Initiate notification appliance and annunciate at fire-alarm control unit and remote annunciators. Record the event on system printer.

2.03 FIRE-ALARM CONTROL UNIT

A. General Requirements for Fire-Alarm Control Unit:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864 and listed and labeled by an NRTL.

a. System software and programs shall be held in flash electrically erasable programmable read-only memory (EEPROM), retaining the information through failure of primary and secondary power supplies.
b. Include a real-time clock for time annotation of events on the event recorder and printer.

2. Addressable initiation devices that communicate device identity and status.

a. Smoke sensors shall additionally communicate sensitivity setting and allow for adjustment of sensitivity at fire-alarm control unit.
b. Temperature sensors shall additionally test for and communicate the sensitivity range of the device.

3. Addressable control circuits for operation of mechanical equipment.

B. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, 3 line(s) of 80 characters, minimum.

2. Keypad: Arranged to permit entry and execution of programming, display, and control commands and to indicate control commands to be entered into the system for control of smoke-detector sensitivity and other parameters.

C. Circuits:

1. Initiating Device, Notification Appliance, and Signaling Line Circuits: NFPA 72, Class B.

a. Initiating Device Circuits: Style D.
b. Notification Appliance Circuits: Style Z.
c. Signaling Line Circuits: Style 5.
d. Install no more than 50 addressable devices on each signaling line circuit.

D. Smoke-Alarm Verification:

1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.
2. Activate an NRTL-listed and -approved "alarm-verification" sequence at fire-alarm control unit and detector.
3. Record events by the system printer.
4. Sound general alarm if the alarm is verified.
5. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.

E. Notification Appliance Circuit: Operation shall sound in the entire building.

F. Elevator Recall:

1. Smoke detectors at the following locations shall initiate automatic elevator recall. Alarm-initiating devices, except those listed, shall not start elevator recall.

a. Elevator lobby detectors except the lobby detector on the designated floor.
b. Smoke detector in elevator machine room.
c. Smoke detectors in elevator hoistway.

2. Elevator lobby detectors located on the designated recall floors shall be programmed to move the cars to the alternate recall floor.
3. Water-flow alarm connected to sprinkler in an elevator shaft and elevator machine room shall shut down elevators associated with the location without time delay.

a. Water-flow switch associated with the sprinkler in the elevator pit may have a delay to allow elevators to move to the designated floor.

G. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke barrier walls shall be connected to fire-alarm system.

H. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory, and print out the final adjusted values on system printer.

I. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to the remote monitoring Receiving Stations.

J. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory and digital alarm communicator transmitters shall be powered by 24-V dc source.

1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.

K. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.

1. Batteries: Sealed lead calcium.

L. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

M. Fire alarm control panel shall be furnished with transient voltage surge suppression on power supply and remote receiving monitor circuit.

N. Fire alarm control panel shall be equipped with a key switch to bypass and/or release electric strike for doors with card access controls incase fire department wants to enter the floors from inside the stairs.

O. Where new fire alarm system is by Simplex, New Fire alarm control panel shall be networkable to existing panel by fiber system. New Fire Alarm panel becomes the Master panel and will control all dial out/reporting functions.

2.04 MANUAL FIRE-ALARM BOXES

A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.

1. Double-action mechanism requiring two actions to initiate an alarm, breaking glass or pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
2. Station Reset: Key- or wrench-operated switch.

2.05 SYSTEM SMOKE DETECTORS

A. General Requirements for System Smoke Detectors:

1. Comply with UL 168; operating at 24-V dc, nominal.
2. Detectors shall be four-wire type.
3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
6. Integral Visual-Indicating Light: LED type indicating detector has operated and power-on status.

7. Remote Control: Unless otherwise indicated, detectors shall be analog-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire-alarm control unit.

    a. Rate-of-rise temperature characteristic shall be selectable at fire-alarm control unit for 15 or 20 deg F (8 or 11 deg C) per minute.
    b. Fixed-temperature sensing shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 or 155 deg F (57 or 68 deg C).
    c. Provide multiple levels of detection sensitivity for each sensor.

B. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).

C. Duct Smoke Detectors: Photoelectric type complying with UL 168A.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).

3. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector.
4. Each sensor shall have multiple levels of detection sensitivity.
5. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
6. Relay Fan Shutdown: Rated to interrupt fan motor-control circuit.

2.06 HEAT DETECTORS

A. General Requirements for Heat Detectors: Comply with UL 521.

B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F (57 deg C) or a rate of rise that exceeds 15 deg F (8 deg C) per minute unless otherwise indicated.

1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

C. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of 190 deg F (88 deg C).

1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.07 NOTIFICATION APPLIANCES

A. General Requirements for Notification Appliances: Individually addressed, connected to a signaling line circuit, equipped for mounting as indicated and with screw terminals for system connections.

1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated and with screw terminals for system connections.

B. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet (3 m) from the horn, using the coded signal prescribed in UL 464 test protocol.

C. Visible Notification Appliances: Xenon strobe lights comply with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "Alert" is engraved in minimum 1-inch- (25-mm-) high letters on the lens.

1. Rated Light Output:

a. 75, 110 and 177 cd as required by layout shown on drawing.
b. 15/30/75/110 cd, selectable in the field.

2. Mounting: Wall mounted unless otherwise indicated.
3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
4. Flashing shall be in a temporal pattern, synchronized with other units.
5. Strobe Leads: Factory connected to screw terminals.
6. Mounting Faceplate: Factory finished, white.

D. Finishes:

1. All Notification appliances shall be white, no exception

2.08 REMOTE ANNUNCIATOR

A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Annunciator located in the PBX room command center shall be equipped with remote microphone and shall be network display unit (NDU) type. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.

1. Mounting: Flush cabinet, NEMA 250, Type 1.

B. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

C. Remote annunciators shall be flush mounted.

2.09 ADDRESSABLE INTERFACE DEVICE

A. Description: Microelectronic monitor module, NRTL listed for use in providing a system address for alarm-initiating devices for wired applications with normally open contacts.

B. Integral Relay: Capable of providing a direct signal to elevator controller to initiate elevator recall and to circuit-breaker shunt trip for power shutdown. Direct signal to all sound consoles and paging system. Fire alarm system shall override sound and paging systems when is in alarm.

2.010 DIGITAL ALARM COMMUNICATOR TRANSMITTER

A. Digital alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL 632 and be listed and labeled by an NRTL.

B. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture two telephone line(s) and dial a preset number for a remote central station. When contact is made with central station(s), signals shall be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both telephone lines, transmitter shall initiate the local trouble signal.

C. Local functions and display at the digital alarm communicator transmitter shall include the following:

1. Verification that both telephone lines are available.
2. Programming device.
3. LED display.
4. Manual test report function and manual transmission clear indication.
5. Communications failure with the central station or fire-alarm control unit.

D. Digital data transmission shall include the following:

1. Address of the alarm-initiating device.
2. Address of the supervisory signal.
3. Address of the trouble-initiating device.
4. Loss of ac supply or loss of power.
5. Low battery.
6. Abnormal test signal.
7. Communication bus failure.

E. Secondary Power: Integral rechargeable battery and automatic charger.

F. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

G. Fire alarm panel shall be networkable type.

2.011 WIRE GUARD

A. Provide wire guard for all devices shown to be installed in gymnasiums.

PART 3 - EXECUTION

3.01 EQUIPMENT INSTALLATION

A. Comply with NFPA 72 for installation of fire-alarm equipment.

B. Equipment Mounting: Install fire-alarm control unit on finished floor with tops of cabinets not more than 72 inches (1830 mm) above the finished floor.

1. Comply with requirements for seismic-restraint devices specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."
2. Comply with requirements for seismic-restraint devices specified in Division 26 Section "Vibration and Seismic Controls for Electrical Systems."

C. Smoke- or Heat-Detector Spacing:

1. Comply with NFPA 72, "Smoke-Sensing Fire Detectors" Section in the "Initiating Devices" Chapter, for smoke-detector spacing.
2. Comply with NFPA 72, "Heat-Sensing Fire Detectors" Section in the "Initiating Devices" Chapter, for heat-detector spacing.
3. Smooth ceiling spacing shall not exceed 30 feet (9 m).
4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Appendix A or Appendix B in NFPA 72.
5. HVAC: Locate detectors not closer than 3 feet (1 m) from air-supply diffuser or return-air opening.
6. Lighting Fixtures: Locate detectors not closer than 12 inches (300 mm) from any part of a lighting fixture.

D. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct.

E. Heat Detectors in Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location.

F. Single-Station Smoke Detectors: Where more than one smoke alarm is installed within a dwelling or suite, they shall be connected so that the operation of any smoke alarm causes the alarm in all smoke alarms to sound.

G. Remote Status and Alarm Indicators: Install near each smoke detector and each sprinkler water-flow switch and valve-tamper switch that is not readily visible from normal viewing position.

H. Audible Alarm-Indicating Devices: Install not less than 6 inches (150 mm) below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille.

I. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches (150 mm) below the ceiling.

J. Device Location-Indicating Lights: Locate in public space near the device they monitor.

K. Fire-Alarm Control Unit: Surface mounted, with tops of cabinets not more than 72 inches (1830 mm) above the finished floor.

L. Annunciator: Install with top of panel not more than 72 inches (1830 mm) above the finished floor.

3.02 CONNECTIONS

A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Division 08 Section "Door Hardware." Connect hardware and devices to fire-alarm system.

1. Verify that hardware and devices are NRTL listed for use with fire-alarm system in this Section before making connections.

B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 3 feet (1 m) from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.

1. Alarm-initiating connection to smoke-control system (smoke management) at firefighter smoke-control system panel.
2. Alarm-initiating connection to stairwell and elevator-shaft pressurization systems.
3. Smoke dampers in air ducts of designated air-conditioning duct systems.
4. Alarm-initiating connection to elevator recall system and components.
5. Alarm-initiating connection to activate emergency lighting control.
6. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
7. Supervisory connections at valve supervisory switches.
8. Supervisory connections at low-air-pressure switch of each dry-pipe sprinkler system.
9. Supervisory connections at elevator shunt trip breaker.
10. Supervisory connections at fire-pump power failure including a dead-phase or phase-reversal condition.
11. Supervisory connections at fire-pump engine control panel.

3.03 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

B. All fire alarm conduits shall be red.

C. All fire alarm box covers shall be painted red.

D. Install framed instructions in a location visible from fire-alarm control unit.

3.04 GROUNDING

A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

3.05 FIELD QUALITY CONTROL

A. Field tests shall be witnessed by Architect, authorities having jurisdiction, owner and commissioning agent.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

D. Tests and Inspections:

1. Visual Inspection: Conduct visual inspection prior to testing.

a. Inspection shall be based on completed Record Drawings and system documentation that is required by NFPA 72 in its "Completion Documents, Preparation" Table in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter.
b. Comply with "Visual Inspection Frequencies" Table in the "Inspection" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.

2. System Testing: Comply with "Test Methods" Table in the "Testing" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.

E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.

F. Fire-alarm system will be considered defective if it does not pass tests and inspections.

G. Prepare test and inspection reports.

H. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.

I. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.06 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION