

PROJECT MANUAL FOR

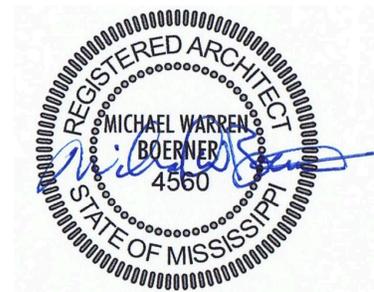
WBA #21-059: UMMC TEACHING KITCHEN

UMMC PROJECT #21NN101

CONSTRUCTION DOCUMENTS

SEPTEMBER 12, 2024

VOLUME 1 OF 1



WIER BOERNER ALLIN ARCHITECTURE, PLLC

Architecture · Planning · Interiors · Graphics

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 JACKSON, MISSISSIPPI

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The following division, while not part of Divisions 0 or 1, is an Owner-issued specification, which should be included in all UMMC projects where firestopping will be required:

DIVISION 07	THERMAL AND MOISTURE PROTECTION
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**THE UNIVERSITY OF MISSISSIPPI MEDICAL CENTER
2500 NORTH STATE STREET
JACKSON, MS 39216**

Notice is hereby given that sealed bids will be received for:

**The University of Mississippi Medical Center
21NN101 Teaching Kitchen**

Bids shall be delivered to Facilities Services, The University of Mississippi Medical Center, Jackson, Mississippi, at **2:00 P.M. on December 5, 2024**, and open immediately thereafter for:

BID #3734

All bids must be sealed and plainly marked on the outside of the envelope:

BID # 3734

**21NN101 Teaching Kitchen
The University of Mississippi Medical Center
UMMC #21NN101
Teaching Kitchen**

Contract documents may be obtained from:

WBA Architecture

2727 Old Canton Road Suite 200

Jackson, Mississippi 39216

Email: rhansen@wbaarchitecture.com

ATTENTION: Ryan Hansen

Bid preparation will be in accordance with the instructions to bidders bound in the project manual.

The University of Mississippi Medical Center reserves the right to waive irregularities and to reject any or all bids. All bids must be addressed as follows:

Address:

Facilities Services

The University of Mississippi Medical Center

Apartment Building B, Room AB003

2500 North State Street

Jackson, Mississippi 39216

Bids may also be submitted electronically at http://www.ms.gov/dfa/contract_bid_search

Please reference RFX #3160006976

Dates of Publication:

November 1, 2024

November 8, 2024

Clarion Ledger

**POLICY STATEMENT
EQUAL OPPORTUNITY IN EDUCATION AND EMPLOYMENT**

The University of Mississippi Medical Center is an EOE/AA/Minorities/Females/Vet/Disability/Sexual Orientation/Gender Identity/Title VI/Title VII/Title IX/504/ADA/ADEA employer.

The University of Mississippi Medical Center provides equal opportunity in any employment practice, education program, or education activity to all qualified persons. UMMC complies with all applicable laws regarding equal opportunity and affirmative action and does not unlawfully discriminate against any employee, student, or applicant based upon race, color, gender, sex, sexual orientation, gender identity or expression, religion, creed, national origin, age, disability, veteran status, marital status, socio-economic status, culture, or genetic information. Inquiries or complaints may be referred to the Office of the Director, Employee Relations, 2500 N. State Street, Jackson, MS 39216-4505.

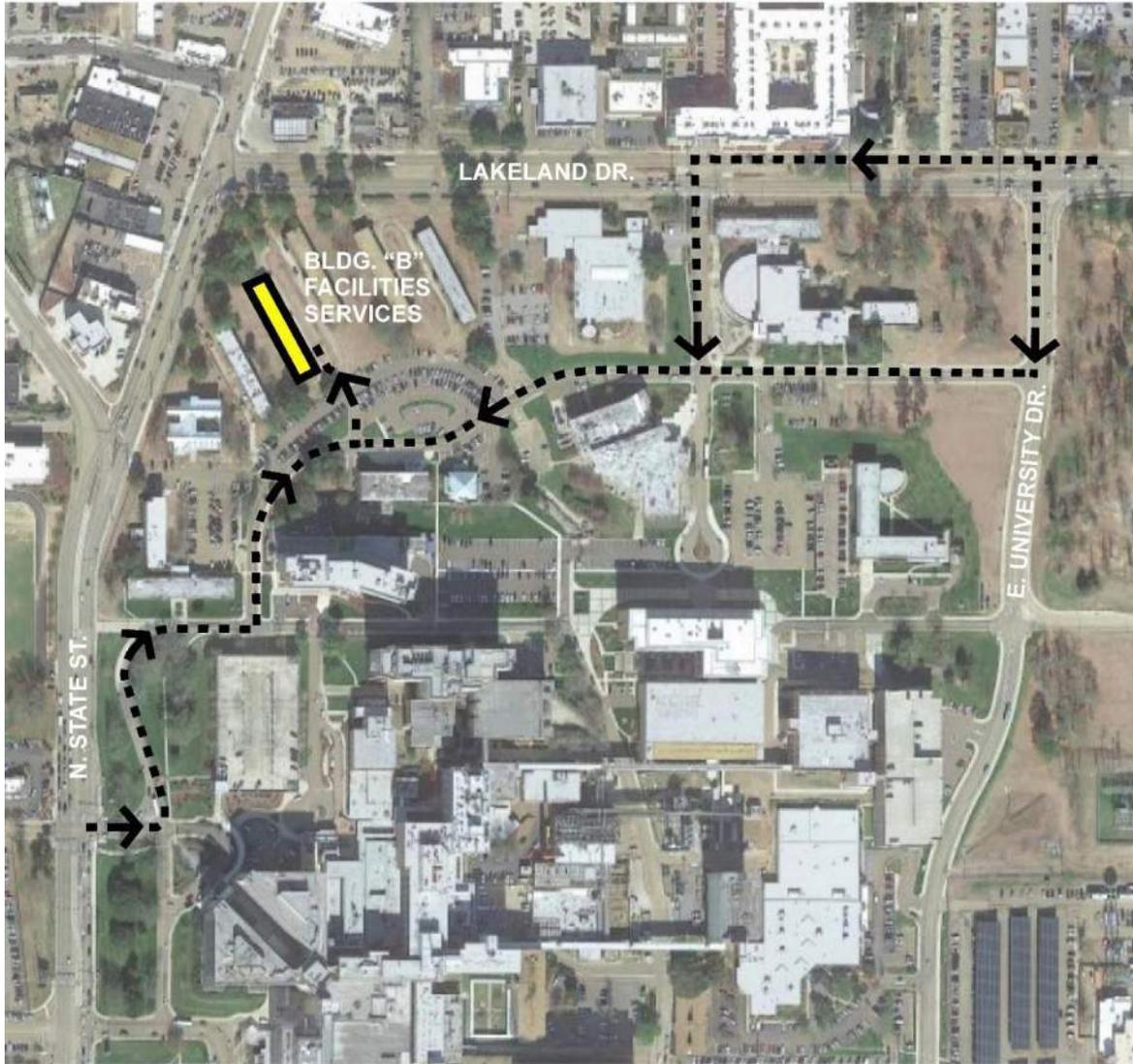
UMMC ensures compliance with all applicable federal and state statutes and executive orders including, but not limited to, Executive Order 11246, as amended, Title VII of the Civil Rights Act of 1964, as amended and the Civil Rights Act of 1991, in respect to unlawful discrimination and affirmative action. UMMC seeks to ensure all aspects of employment and education remain free of unlawful discrimination and reaffirms its belief in taking affirmative action to recruit, employ and to advance in employment minorities; women; individuals with disabilities; and veterans.

The director of employee relations also serves as the Americans with Disabilities Act (ADA) Coordinator. Those with a bona fide disability needing reasonable accommodation should contact the director of employee relations.

It is understood that any breach of UMMC's Equal Opportunity in Education and Employment Policy regarding unlawful discrimination because of a person's race, color, gender, sex, sexual orientation, gender identity or expression, religion, creed, national origin, age, disability, veteran status, marital status, socio-economic status, culture, or genetic information shall be grounds for disciplinary action up to and including discharge.

To ensure compliance with this policy, the vice chancellor for health affairs has designated UMMC's chief human resources officer (CHRO) to direct the establishment of and to monitor the implementation of HR procedures to promote and guide our affirmative action program. Affirmative Action is taken to prohibit discrimination as required by applicable law.

Directions to Facilities Services at UMMC:



UMMC Campus, Jackson, MS - Northwest Corner



Facilities Services - Apartment Building B

SECTION 002113

INSTRUCTIONS TO BIDDERS

1 PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Interpretations: Should a bidder find discrepancies in or omissions from the plans and specifications or be in doubt as to their written meaning, the bidder should immediately notify the Architect in writing. The Architect will then send a written instruction or interpretation to all known holders of the documents if deemed appropriate by the Architect. Neither the Owner nor the Architect will be responsible for nor bound by any oral instructions.
- B. Addenda: Any addenda to the plans and/or specifications issued before or during the time of bidding will become a part of the Contract and receipt of same must be acknowledged by Bidder in their proposal.
- C. "Or Equal" Substitutions: Refer to Section 007300, Article 3.4.2 and to Section 016000 - "Or Equal" Substitutions: Bidder is advised that some sections of the specifications may not allow for "or equal" substitutions and that the requirements of Sections 007300 and 016000 must be strictly complied with to obtain an "or equal" substitution where an "or equal" substitution is allowed. Failure to strictly comply with Sections 007300 and 016000 and any requirements in the technical specifications which do not conflict with and which are in addition to Sections 007300 and 016000 may, in the Owner's sole discretion, result in the rejection of the request for "or equal" substitution.

1.2 BIDDING

- A. Contract for Construction: Lump sum, single bid received from General Contractors and shall include General, Mechanical, Electrical, and Site work as well as all other work shown on plans and specified herein.
- B. Subcontractors and Suppliers: The Bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a Subcontract or Purchase Order under this Contract must be acceptable to the Owner.
 - 1. The Owner may make such investigation as necessary to determine the ability of the Bidder or subcontractors or suppliers to perform the work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated therein within the time required.

1.3 CERTIFICATE OF RESPONSIBILITY

- A. Each Bidder submitting a bid in excess of \$50,000.00 must show on their bid and on the face of the envelope containing the bid, the contractor's Certificate of Responsibility Number, as required by §§ 31-3-15 and 31-3-21 (latest edition) Mississippi Code of 1972. If the bid does not exceed \$50,000.00, a notation so stating must appear on the face of the envelope. When multiple contractors submit a joint venture bid in excess of \$50,000 a Joint Venture Certificate of Responsibility Number is required on the bid and face of the envelope. If the multiple Contractor Joint Venture has no Joint Venture Certificate of Responsibility number, each of the Contractors participating in the bid must indicate their individual Certificate of Responsibility numbers on the bid and on the face of the envelope.

- B. Each subcontractor whose Subcontract exceeds \$50,000.00 shall have a Certificate of Responsibility Number, as required by §§ 31-3-15 and 31-3-21 (latest revision), Mississippi Code.
- C. Evidence: No bid will be opened, considered or accepted unless the above information is given as specified. Sufficient evidence that said Certificate of Responsibility has been issued and is in effect at the time of receiving bids must be submitted when required by the Owner or the Architect. Likewise, it shall be the responsibility of the Prime Contractor to require a Certificate of Responsibility Number from any subcontractor that falls in the category of "B" above.
- D. In accordance with Mississippi law, if the Bidder is a joint venture, either the joint venture or all of the Contractors which make up the joint venture must hold certificates of responsibility from the Mississippi State Board of Contractors.

1.4 PRE-BID CONFERENCE

- A. A pre-bid conference has been scheduled at _____.
- B. All general contract/major subcontract Bidders and Suppliers are urged to attend.
- C. All Bidders are expected to have familiarized themselves with conditions relating to the Work prior to the pre-bid conference.

1.5 NON-RESIDENT CONTRACTOR

- A. When a non-resident Contractor submits a bid for a Mississippi public project, the contractor shall, prior to submission of the bid, attach thereto a copy of their resident State's current law pertaining to such State's treatment of non-resident Contractors as required by §§ 31-3-15 and 31-3-21, Mississippi Code, (latest revisions) or, if the State has no such law, a statement indicating the "State of (name of State) has no resident Contractor preference law". Failure to include this information or statement will result in the bid being considered non-responsive and it will be rejected.

1.6 BID SECURITY

- A. Each bid exceeding \$5,000.00 must be accompanied by the Bidder's certified check, cashier's check or a bid bond, duly executed by the Bidder as principal and having surety thereon, a surety company approved by the Owner and signed by an agent resident in Mississippi, in the amount of 5% of the bid. All bid bonds must be accompanied by the appropriate Power of Attorney designating the Mississippi Resident Agent.

1.7 OPENING OF PROPOSALS

- A. Refer to the Advertisement for Bids.

1.8 PREPARATION OF BID

- A. Conditions of Work: Each Bidder must fully inform itself of the conditions relating to the construction of the project and employment of labor thereon. Failure to do so will not relieve a successful Bidder of their obligation to furnish all material and labor necessary to carry out the provisions of his Contract. The Contractor must employ methods or means to cause no interruptions of or interference with the work of any other Contractor.

UMMC Badges: The general contractor superintendent and all sub-contractor superintendents working inside the building will be required to obtain a background check and UMMC badge at a cost of \$50 / badge. Badges will be returned to the UMMC construction project manager at

the completion of the job. Payment is due upon receipt of the badge. Forms of payment include: credit card, debit card, company checks and cash. Personal checks are not accepted. The UMMC project manager will be able to assist in obtaining badges.

- B. Examination of Site: All Bidders, including Contractors and subcontractors, will visit the site of the Project, compare the plans and specifications to actual conditions and inform themselves of all conditions which may affect or impede construction, including but not limited to, the location of all utilities which may need to be disconnected and/or relocated to allow the orderly and timely performance of the Work. Failure to visit the site will in no way relieve the successful Bidder from their obligation to complete all Work in accordance with the Contract Documents without additional cost to the Owner.
- C. Utility Disconnection and/or Relocation: During the examination of the site, Bidders shall identify all utilities that must be disconnected and/or relocated to allow the orderly progress of the Work. Allow up to 45 days for such activity in Contractor's progress schedule required by Section 013100 or 013110, whichever applies, from the date of request to Owner via Architect for disconnection and/or relocation of such utilities to completion of such activity.

No time extension will be allowed if Contractor fails to give timely notice of the need for utility disconnection and/or relocation and Contractor is unable to timely perform the Work dependent upon such disconnection and/or relocation or if the date(s) included in the Contractor's progress schedule for disconnection and/or relocation are inadequate.

Contractor shall coordinate the disconnection and/or relocation of utilities with the Owner. The dates which Contractor includes in its progress schedule for utility disconnection and/or relocation are subject to coordination with Owner's operation requirements and Owner's acceptance of such dates, which acceptance will not be unreasonably withheld.

The utilities that may need to be disconnected or relocated may include, but are not limited to, medical gases, water (steam, heated, chilled, domestic and fire), power and communications (telephone and data).

- D. Laws and Regulations: The Bidder's attention is directed to the fact that all applicable state and federal laws and the rules and regulations of all authorities having jurisdiction over construction of the project apply to the Contract. The successful Bidder shall be required to comply with all applicable laws, ordinances, rules and regulations at no additional cost to Owner whether such laws, ordinances, rules and/or regulations are enacted or adopted before or after last Addendum date.
- E. Obligation of Bidder: At the time of opening of bids, Bidder will be presumed to have inspected the site and to have read and be thoroughly familiar with the plans and specifications, including all addenda.
- F. Irregularities: The omission of any information requested on the Proposal Form may be considered as an informality, or irregularity, by the Owner when in their opinion the omitted information does not alter the amounts contained in the submitted bid proposal, or place other Bidders at a disadvantage.
- G. Protest: Any protest must be delivered in writing to the Owner within twenty-four (24) hours after the time of the bid opening.
- H. Mistakes: Any claim of mistake in bid must be delivered in writing to the Owner within twenty-four (24) hours after the time of the bid opening. The bidder shall provide sufficient documentation with the written request clearly proving that a mistake was made and that the bidder is entitled to the relief requested.

- I. Bidders should mark any and all pages of the proposal considered to be proprietary information which may remain confidential in accordance with Miss. Code Ann. §§ 25-61-9 and 79-23-1 (1972, as amended). Each page of the proposal that the Bidder considers trade secrets or confidential commercial or financial information should be on a different color paper than non-confidential pages and be marked in the upper right hand corner with the word "CONFIDENTIAL." Failure to clearly identify trade secrets or confidential commercial or financial information will result in that information being released subject to a public records request.
- J. UMMC is a public agency of the State of Mississippi and is subject to the Mississippi Public Records Act, Miss. Code Ann. § 25- 61-1, *et seq.* If a public records request is made for any information provided to UMMC regarding this RFP, UMMC shall promptly notify Bidders of such request. UMMC shall not be liable to Bidders for disclosures of information required by court order or required by law. UMMC also is subject to the provision of the Mississippi Accountability and Transparency Act of 2008, Miss. Code Ann., § 27-104-151, *et seq.*, and is required to provide public access to its financial information and expenditures through the Institutions of Higher Learning Accountability and Transparency website.

1.9 PROPOSALS

- A. Form: Submit all proposals on forms provided and fill all applicable blank spaces without interlineation, alteration, or erasure and recaptulations of the work to be done. No oral, telegraphic, or telephonic proposals will be considered. Proposals via MAGIC will be received according to standards set forth by the Mississippi Department of Finance and Administration. Any addenda issued during the bidding must be noted on the Proposal Form. On the proposal form the bidder shall write out the Base Bid amount in words and include the numerical amount. The written word shall govern.
- B. Withdrawal: Any bid may be withdrawn prior to the time for opening of bids or authorized postponement thereof. Any bid received after the time and date specified will not be considered. All bids are irrevocable offers to contract at the price bid which may not be withdrawn until 60 days after bid opening.
- C. Submittal: Submit one (1) original bid in an opaque sealed envelope bearing on the outside, the name and Certificate of Responsibility number of the Bidder, bidder's address, the bid file number, bid opening date, and time. Copies of the bid, if submitted, will not be considered. See the below sample Envelope for submission:

<p><i>(In upper left hand corner)</i> Name of Firm <i>(As it appears in the current Mississippi State Board of Contractors Roster)</i></p>	<p><i>(Bid shall be addressed and delivered to)</i> Facilities Services The University of Mississippi Medical Center Apartment B, Room AB 003 2500 North State Street, Jackson, MS 39216</p>
<p><i>(In the lower left hand corner)</i> Bid File #: _____ UMMC Project #: _____ UMMC Project Name: _____ Bid Date and Time: _____ Certificate of Responsibility #: _____</p>	

- D. Any bid modification or qualification on the outside of the envelope will not be considered.

- E. Mailing: If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to:

**Facilities Services
The University of Mississippi Medical Center
2500 North State Street
Jackson, Mississippi 39216-4505**

- F. Bidders are urged to deliver their bid to the Owner. Owner will not be responsible for misdelivered bids or other delays of mail or express deliveries to Facilities Services before the receipt dead line.

1.10 Contract

- A. Award of Contract: Award shall be made to the lowest and best Bidder, pursuant to Mississippi law and these Instructions to Bidders. The lowest bid shall be the base bid or combination of base bid and those alternates taken in order of priority to stay within available funds. The Owner reserves the right to waive irregularities and to reject any and all bids.

- B. Post-Bid Information/Contractor's Qualification Submission: The Contractor's qualifications to execute the construction is vitally important to the Owner. As a conditional precedent to award of the Contract and for the purpose of demonstrating the Bidder's ability to perform, the two (2) apparent low bidders will be required to submit their qualifications by completing AIA Document A305-1986, Contractor's Qualification Statement (See Supplement "A" attached to this Section) as well as providing the requested information in accordance with Supplement "B" - Instructions to Bidders attached to this Section. Two hard copies of this information shall be submitted to and received by the Architect within two (2) business days of the official notification subsequent to the bid opening. The Owner may waive the request for Qualifications at its discretion if a bidder has submitted qualifications on a project of similar size and scope in the last year. Consistent with Mississippi law, the Owner, at its sole discretion, may elect to conduct post-bid interviews as part of its investigation of bidder's qualifications to aid in determining the lowest and best bidder.

- C. The apparent low Bidder shall submit a listing of subcontractors and suppliers for each subcontractor and supplier whose bid or quote exceeds \$50,000.00 within three (3) business days of Owner's request.

Failure to submit the Listing of Subcontractors and Suppliers within the time required shall render the Bidder non-responsible and their bid shall be rejected.

- D. Disqualification of Bidder. The Owner reserves the right to award to other than the low Bidder when, in the Owner's judgment, it is in the Owner's best interest to do so. For instance, a Bidder may be disqualified for such reasons as:

1. Bidder being in arrears on existing contracts.
2. Bidder being in litigation with the Owner or another state agency.
3. Bidder having defaulted on or failed to satisfactorily complete a previous contract with the Owner, including Bidder's failure to satisfactorily fulfill the warranty obligations of a previous contract with the Owner.
4. Bidder's disregard for safety rules and regulations on other contracts with Owner.

The above is not an all-inclusive list.

- E. Security for Faithful Performance: When the bid exceeds \$5,000.00 and simultaneously with the Contractor's delivery of the executed Contract, the Contractor will furnish a payment and a performance bond in accordance with § 31-5-51 et. seq. of the Mississippi Code (latest edition).

The surety on such bonds will be by a duly authorized surety company licensed to do business in the State of Mississippi which is acceptable to the Owner.

- F. Time of Completion: By submission of its bid, Bidder agrees to commence work on or before a date specified in a written "Notice to Proceed" order and to fully complete the Project within the time stated in the Bid Proposal Form.
- G. Substantial Completion: Substantial completion of the Project as defined by Section 007300, Article 9.8 requires the submittal by Contractor of all closeout documents required by Section 017000, all operations and maintenance (O&M) manuals required by Section 017800 and/or the technical sections of the Contract, the Guarantee of Work required by Section 007300, Article 9.8.1 and the manufacturers' certifications required by Section 017100, Part 1.4.B. Bidder's attention is specifically directed to Sections 007200, Article 9.8 and 007300, Article 9.8 for additional conditions precedent to substantial completion of the Project.
- H. Liquidated Damages for Failure to Enter Into Contract: The successful Bidder, upon his failure or refusal to execute and deliver the Contract and required bonds within ten days after he has received notice of the acceptance of his bid, will forfeit to the Owner as liquidated damages the security deposited with his bid.
- I. Liquidated Damages for Failure to Substantially Complete Project in Time Stipulated: Applicable when stipulated sum is shown in Section 007300, Article 9.11.

1.11 BID DOCUMENTS

- A. Plans and Specifications provided by the Architect will be provided electronically in Adobe Portable Document Format (PDF), unless noted otherwise on the Advertisement for Bid.
- B. If applicable, deposits will be returned upon the Architect's receipt of the bid documents in good condition within ten (10) days after the opening of bids.
- C. No partial sets of documents will be issued or accepted for return.
- D. Post Award: Up to six (6) sets of Construction Documents will be provided by the Architect to the Awarded Contractor for use during construction.

END OF SECTION

 **AIA** Document A305™ – 1986

Contractor's Qualification Statement

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

SUBMITTED TO:

ADDRESS:

SUBMITTED BY:

NAME:

ADDRESS:

PRINCIPAL OFFICE:

- Corporation
- Partnership
- Individual
- Joint Venture
- Other

NAME OF PROJECT: *(if applicable)*

TYPE OF WORK: *(file separate form for each Classification of Work)*

- General Construction
- HVAC
- Electrical
- Plumbing
- Other: *(Specify)*

§ 1 ORGANIZATION

§ 1.1 How many years has your organization been in business as a Contractor?

§ 1.2 How many years has your organization been in business under its present business name?

§ 1.2.1 Under what other or former names has your organization operated?

§ 1.3 If your organization is a corporation, answer the following:

§ 1.3.1 Date of incorporation:

§ 1.3.2 State of incorporation:

§ 1.3.3 President's name:

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This form is approved and recommended by the American Institute of Architects (AIA) and The Associated General Contractors of America (AGC) for use in evaluating the qualifications of contractors. No endorsement of the submitting party or verification of the information is made by AIA or AGC.

§ 1.3.4 Vice-president's name(s)

§ 1.3.5 Secretary's name:

§ 1.3.6 Treasurer's name:

§ 1.4 If your organization is a partnership, answer the following:

§ 1.4.1 Date of organization:

§ 1.4.2 Type of partnership (if applicable):

§ 1.4.3 Name(s) of general partner(s)

§ 1.5 If your organization is individually owned, answer the following:

§ 1.5.1 Date of organization:

§ 1.5.2 Name of owner:

§ 1.6 If the form of your organization is other than those listed above, describe it and name the principals:

§ 2 LICENSING

§ 2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.

§ 2.2 List jurisdictions in which your organization's partnership or trade name is filed.

§ 3 EXPERIENCE

§ 3.1 List the categories of work that your organization normally performs with its own forces.

§ 3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)

§ 3.2.1 Has your organization ever failed to complete any work awarded to it?

§ 3.2.2 Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?

§ 3.2.3 Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?

§ 3.3 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

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§ 3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.

§ 3.4.1 State total worth of work in progress and under contract:

§ 3.5 On a separate sheet, list the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.

§ 3.5.1 State average annual amount of construction work performed during the past five years:

§ 3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization.

§ 4 REFERENCES

§ 4.1 Trade References:

§ 4.2 Bank References:

§ 4.3 Surety:

§ 4.3.1 Name of bonding company:

§ 4.3.2 Name and address of agent:

§ 5 FINANCING

§ 5.1 Financial Statement

§ 5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);

Net Fixed Assets;

Other Assets;

Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes);

Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

§ 5.1.2 Name and address of firm preparing attached financial statement, and date thereof:

§ 5.1.3 Is the attached financial statement for the identical organization named on page one?

§ 5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsiary).

§ 5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

§ 6 SIGNATURE

§ 6.1 Dated at this day of

Name of Organization:

By:

Title:

§ 6.2

I, _____, being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this day of

Notary Public:

My Commission Expires:

SUPPLEMENT "B" – INSTRUCTIONS TO BIDDERS

Pursuant to Section 002113 – Instructions to Bidders, and as requested by The University of Mississippi Medical Center, we are conducting an investigation of the three lowest bidders' experience and ability to perform a project of this size and complexity.

To facilitate this investigation, we request the following information:

1. Detailed information relative to your company's relevant healthcare construction experience, focusing on representative hospital projects of similar or greater size, scope and complexity including infection control. Identify relevant experience as general contractor for 3 projects in 5 years with minimum construction value of Two Hundred and Fifty Thousand Dollars (\$250,000.00) each.
2. Names, addresses, and telephone numbers of individuals who can comment on your company's performance on the projects listed.
3. Whether your company is in arrears on any existing contracts, and, if so, please explain.
4. Whether your company is in any current litigation with a project owner, and, if so, please explain.
5. Whether your company has ever failed to complete a project or any warranty obligation on a project, and, if so, please explain.
6. The project team proposed by the General Contractor including, project manager and superintendent (including names and relevant qualifications of all personnel).

END OF SECTION

BID PROPOSAL FORM

Date: _____

Proposal From: _____
(Bidder)

Facilities Services
The University of Mississippi Medical Center
2500 North State Street
Jackson, Mississippi 39216-4505

RE: Bid File # _____

To whom it may concern:

Having carefully examined the Contract Documents and all addenda for the referenced Project, as well as the premises and conditions affecting the work, I, the undersigned, propose to furnish all labor, materials, and services required by the Contract Documents in accordance with the conditions of said Contract Documents for the sums set forth below:

BASE BID:

_____ (\$ _____).

ALTERNATE #1:

_____ (\$ _____).

ALTERNATE #2:

_____ (\$ _____).

ALTERNATE #3:

_____ (\$ _____).

I (We) agree to hold our bid open for acceptance for sixty (60) calendar days from the date of bid opening.

If awarded this Contract, I, (We), agree to execute a Contract and start Work on a date to be set in a Notice to Proceed and to complete the entire work in _____ days, subject to the terms and conditions of the Contract.

As required by Section 002113-1.6, "Bid Security", Bid Security in the form of a _____ is attached hereto in the amount of _____ and shall become the property of the Owner in the event the Agreement and required Bonds are not executed within the time set forth herein before as liquidated damages for the delay and additional expense to the Owner caused thereby.

ADDENDUM RECEIPT: The receipt of the following Addenda to the Bidding Documents is hereby acknowledged:

Addendum No. _____ dated _____

Our Corporation is chartered under the laws of the State of _____, and the names, titles and business addresses of the principal officers are as follows (non-residents Bidders see Section 002113, Paragraph 1.5):

Name: _____ Title: _____

Address: _____

Name: _____ Title: _____

Address: _____

Name: _____ Title: _____

Address: _____

(TO BE FILLED IN IF A PARTNERSHIP)

Our Partnership is composed of the following individuals:

Name: _____ Title: _____

Address: _____

Name: _____ Title: _____

Address: _____

Name: _____ Title: _____

Address: _____

Notice of acceptance of our bid may be mailed, telegraphed or delivered to:

SIGNED: _____

BY: _____

TITLE: _____

CERTIFICATE OF RESPONSIBILITY NO.: _____
(TO BE FILLED IN IF A CORPORATION)

The University of Mississippi Medical Center
AGREEMENT AND CERTIFICATION OF COMPLIANCE WITH FEDERAL LAWS AND REGULATIONS

Company Name: _____

Address: _____

City: _____ State: _____ Zip: _____

I. THE EQUAL OPPORTUNITY CLAUSE (If this Contract exceeds or will exceed \$10,000) During the performance of this Contract, Contractor agrees to be bound by the following provisions as contained in Section 202 of Executive Order 11246, as amended to wit:

- (1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, handicap, veteran status, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.
- (2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, veteran status, handicap, or age.
- (3) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided by the agency contractor officer, advising the labor union or worker's representative of the Contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (4) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (5) The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (6) In the event of the Contractor's noncompliance with the non-discrimination clauses of this Contract or with any of such rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized by Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- (7) The Contractor will include the provisions of Paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions including sanctions or non-compliance: Provided, however, that in the event the Contractor becomes involved in, or is threatened with litigation by the contracting agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

- II. **CERTIFICATION OF NONSEGREGATED FACILITIES** (If this Contract exceeds or will exceed \$10,000) Contractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. He certifies that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. Contractor agrees that a breach of his certification is a violation of the Equal Opportunity Clause in this Contract. As used in this certification, the term "segregated facilities" mean any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom or otherwise. He further agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of such Subcontracts exceeding \$10,000 which are not exempt from the provisions of Equal Opportunity Clause, that he will retain such certifications in his files; and that he will forward notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods): **NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES.** A Certification of Non segregated Facilities as required by the May 21, 1968, order on Elimination of Segregated Facilities, by the Secretary of Labor (33 Fed. Reg. 7804, May 28, 1968, must be submitted prior to the award of a Subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity Clause. The certification may be submitted either for each Subcontract or for all Subcontracts during a period (i.e., quarterly, semiannually, or annually). (NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.)
- III. **EMPLOYER INFORMATION REPORT EEO.6**
The undersigned Contractor further agrees and certifies that, if the value of any contract or purchase order is \$50,000 or more and the Contractor has 50 or more employees, Contractor will file a complete and accurate report on EEO.6 Form 221 (EEO.6 with the Higher Education Reporting Committee at the appropriate address per the current instructions within thirty (30) days of the date of Contract award, unless such report has been filed within the twelve (12) months period preceding the date of the Contract award and otherwise comply with the file such other compliance reports as may be required under Executive Order 11246, as amended, and Rules and Regulations adopted thereunder.
- IV. **WRITTEN AFFIRMATIVE ACTION PROGRAMS**
The undersigned Contractor further agrees and certifies, that if the value of any contract or purchase order is \$50,000 or more and the Contractor has 50 or more employees, Contractor will develop written affirmative action compliance programs for each of its establishments as required by Title 41, Code of Federal Regulation, Section 60-1.40, Section 60-2 and Section 60-250.5.
- V. **VETERANS EMPLOYMENT CLAUSE** (If this Contract is for \$10,000 or more)
(A) Contractor agrees to abide by and comply with the provisions of Presidential Executive Order 11701 and the provisions of 38USC2012 unless exempted as therein provided and which provisions are incorporated herein by reference to the same extent as though set forth herein in full. Contractor agrees that all employment openings of the Contractor which exist at the time of the execution of this Contract and those which occur during the performance of his Contract including those not generated by the Contract and including those occurring at an establishment of the Contractor other than the one wherein the Contract is being performed but excluding those of independently operated corporate affiliates, shall, to the maximum extent leasable, be offered for listing at an appropriate office of the State employment service system and to provide such periodic reports to such office regarding employment openings and hires as may be required: Provided, that his provision shall not apply to openings which the Contractor fills from within its organization or are filled pursuant to a customary and traditional employer-union hiring agreement and that the listing of employment openings shall involve only the normal obligations which attach to the placing of job orders.
(B) Contractor agrees further to place the above provisions in any sub-contract directly under this Contract.
- VI. **EXECUTIVE ORDER 11625-MINORITY BUSINESS ENTERPRISES**

Pursuant to Executive Order 11625 and applicable to all contracts or purchase order is excess of \$5,000, except contracts which are personal in nature, the Contractor shall be bound by and agrees to the following provisions as set forth in Section 1-1310.2 of Title 41 of the Code of Federal Regulations:

UTILIZATION OF MINORITY BUSINESS ENTERPRISES

- (a) It is the policy of the Government that minority business enterprises shall have the maximum practicable opportunity to participate in the performance of Government Contracts.
- (b) The Contractor agrees to use its best efforts to carry out this policy in the award of its Subcontracts to the fullest extent consistent with the efficient performance of this Contract. As used in this Contract, the term "minority business enterprise" means a business, at least 50 percent of which is owned by minority group members or, in case of publicly owned business, at least 51 percent of the stock of which is owned by minority group members. For the purpose of this definition, minority group members are Negroes, Spanish-speaking American persons, American-Orientals, American-Indians, American Eskimos, and American Aleuts. Contractors may rely on written representations by subcontractors regarding their status as minority business enterprises in lieu of an independent investigation. In all procurement contracts containing above clauses (a) and (b) which may exceed \$500,000 and which offer substantial subcontracting possibilities, the following clauses shall be included:

MINORITY BUSINESS ENTERPRISES SUBCONTRACTING PROGRAM

- (a) The Contractor agrees to establish and conduct a program which will enable minority business enterprises (as defined in the clause entitled "Utilization of Minority Business Enterprises") to be considered fairly as subcontractors and suppliers under this Contract. In this connection, the Contractor shall:
 - (1) Designate a liaison officer who will administer the Contractor's minority business enterprises program.
 - (2) Provide adequate and timely consideration of the potentialities of known minority business enterprises in all "Make-or-buy" decisions.
 - (3) Assure that known minority business enterprises will have an equitable opportunity to compete for Subcontracts, particularly by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation of minority business enterprises.
 - (4) Maintain records showing (i) procedures which have been adopted to comply with the policies set forth in this clause, including the establishment of a source list of minority business enterprises, (ii) awards to minority business enterprises on the source list, and (iii) specific efforts to identify and award contracts to minority business enterprises.
 - (5) Include the Utilization of Minority Business Enterprises clause in Subcontracts which offer substantial minority business enterprises subcontracting opportunities.
 - (6) Cooperate with the Contracting Officer in any studies and surveys of the Contractor's minority business enterprises procedures and practices that the Contracting Officer may from time to time conduct.
 - (7) Submit periodic reports of subcontracting to known minority business enterprises with respect to the records referred to in subparagraph (4), above, in such form and manner and at such time (not more often than quarterly) as the Contracting Officer may prescribe.
- (b) The Contractor further agrees to insert, in any Subcontract hereunder which may exceed \$500,000 provisions which shall conform substantially to the language of this clause, including this paragraph (b), and to notify the Contracting Officer of the names of such subcontractors.

- VII EXECUTIVE ORDER 11758-EMPLOYMENT OF HANDICAPPED PERSONS (If this Contract is for \$2,500 or more)
- (A) Contractor agrees that it will abide by and comply with the provisions of the Affirmative Action Clause, Section 60-741.4 of 41 CFR, regarding Affirmative Action of Handicapped Workers, which provisions are incorporated herein by reference to the same extent as though set forth herein in full.

Contractor agrees to place the above provisions in any Subcontract or purchase order of \$2,500 or more directly under this Contract unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 503 of the Rehabilitation Act of 1973.

This certification shall be valid for the period of the Contract. Dated this _____ day of _____, 20 ____.

BID FILE (Contract Number): _____

Title of Authorized Company Representative: _____

SMALL BUSINESS CERTIFICATION STATEMENT

Please sign all applicable statements.

1. I do hereby certify that the company indicated below is a Small Business as defined by law.

NAME & TITLE: _____

SIGNATURE: _____

2. I do hereby certify that the company indicated below is a Disadvantaged Business concern owned and controlled by socially and economically disadvantaged individuals as defined by law.

NAME & TITLE: _____

SIGNATURE: _____

NAME OF COMPANY: _____

SIGNED: _____

If you have any questions, please contact Contracts Administration, University of Mississippi Medical Center.
(601) 815-3872.

- the express written consent of UMMC which has been executed by a duly authorized UMMC officer and which specifically details the permitted uses of such by Vendor.
11. **Expenses.** All expenses in excess of \$500 must be pre-approved in writing by UMMC, and reimbursement requests must be accompanied by receipts or documentation satisfactory to UMMC evidencing such expense. If any expenses in excess of \$500 are not pre-approved by UMMC, or if any of the documentation of any such expenses is not satisfactory to UMMC, UMMC shall not be responsible to reimburse Vendor for the same. Vendor must abide by the University of Mississippi Medical Center's current Travel and Expense Policy, a copy of which may be found at www.umc.edu/Contracts/Resources-Forms.html.
 12. **Audit Requests.** Vendor must give reasonable prior notice to UMMC's Office of Integrity and Compliance in order to obtain approval to review UMMC records at Vendor's expense, such authorization shall not be unreasonably withheld.
 13. **Education About False Claims Recovery Act.** Vendor acknowledges receipt of UMMC's "Education About False Claims Recovery Act", which may be found at www.umc.edu/Contracts/Resources-Forms.html; agrees to abide by same in its business with UMMC; and agrees to provide same to its employees performing services under the Agreement.
 14. **Discounts; Rebates.** If Vendor is providing UMMC any discounts or rebates which are required to be reported to Medicaid, Medicare or any other federal or state health care program, Vendor shall fully and accurately report such discount on all invoices, coupons or statements submitted to UMMC. Vendor will refrain from doing anything which would impede UMMC from meeting its discount reporting obligations, and will indemnify and hold UMMC harmless from any claim asserted against UMMC by Medicaid, Medicare or any other federal or state health care program, or any state or the federal government related to, connected to, or arising from Vendor's failure to abide by the terms of this paragraph.
 15. **Record Retention.** If a party carries out any of the duties of the Agreement through a subcontract, with a value or cost of Ten Thousand Dollars (\$10,000.00) or more over a twelve (12) month period, with a related organization, such subcontract will contain a clause to the effect that, until the expiration of four (4) years after the furnishing of such services pursuant to such subcontract, the related organization will make available, upon written request of the Secretary of HHS, or upon request of the Comptroller General of the United States, or any of their duly authorized representatives, the subcontract, and books, documents, and records of such organization that are necessary to verify the nature and extent of such costs.
 16. **Representations of Vendor.** Vendor represents and warrants that Vendor, its officers, directors and employees (a) are not currently excluded, debarred, or otherwise ineligible to participate in any federal health care programs or any state healthcare programs; (b) have not been convicted of a criminal offense related to the provision of healthcare items or services and have not been excluded, debarred, or otherwise declared ineligible to participate in the Federal Healthcare Programs or any state healthcare programs, (c) are not, nor have ever been included on the Office of Foreign Assets Control, Specially Designated Nationals and Blocked Persons list; and (d) are not, to the best of its knowledge, under investigation or otherwise aware of any circumstances which may result in Vendor being excluded from participation in the Federal Healthcare Programs or any state healthcare programs. These shall be ongoing representations and warranties during the term of the Agreement and Vendor shall immediately notify UMMC of any change in the status of the representations and warranty set forth in this section. Any breach of this section shall give UMMC the right to terminate the Agreement immediately for cause.
 17. **Compliance with Applicable Laws.** The parties believe the Agreement avoids any element of inappropriate reimbursement for services as currently provided under federal or state law. Nothing in the Agreement shall be construed as a promise or obligation on the part of either party to refer patients or business to the other party. The parties agree to comply with all applicable local, state, and federal laws, rules, and regulations.
 18. **Change in Law.** (i) If during the term hereof any Change of Law (defined below) results in an Adverse Consequence (defined below), the parties agree to make reasonable revisions to the Agreement to avoid such Adverse Consequences while seeking to maintain the parties as close as possible to their original positions despite such revisions. Upon notice by one party to another of such Change of Law, the parties agree that they shall attempt to resolve the matter within thirty (30) days of such notice. If the parties cannot agree upon renegotiated terms hereunder within such 30-day period, then the Agreement will terminate immediately upon written notice by one party to the other of an inability to agree. (ii) As used herein, "Change of Law" shall mean: (A) any new legislation enacted by the federal government or the government of Mississippi; (B) any new third party payor or governmental agency law, rule, regulation or guideline; or (C) any judicial order or decree. (iii) As used herein, "Adverse Consequence" shall mean a Change of Law that prohibits, restricts, limits or otherwise affects either party's rights or obligations hereunder in a material manner or otherwise makes it desirable to restructure the relationship established hereunder because of material legal consequences, including loss of tax exempt status, expected to result from such Change of Law.
 19. **Patent Records and Confidentiality.** Vendor agrees to execute, upon UMMC's request, a Business Associate Agreement ("BAA") in form satisfactory to UMMC. All medical records and materials relating to patients shall be and remain the property of UMMC. UMMC may utilize its own business records and the information contained therein for whatever purposes it so chooses. The parties acknowledge that Mississippi state law as to public records and transparency governs the Agreement.
 20. **Independent Contractor.** It is understood by the parties that Vendor, including its employees, is an independent contractor and is not an employee or agent of UMMC. Vendor understands and agrees that neither it nor its employees performing services hereunder shall be entitled to any of the rights, fringe benefits and privileges established for UMMC's employees. Vendor retains sole and absolute discretion, control and judgment in the manner and means of carrying out its assignments. Vendor and its employees shall at all times be acting as and deemed to be independent contractors. Nothing contained in the Agreement shall be construed to create a partnership, joint venture, agency or employment relationship between Vendor and UMMC. UMMC shall have no responsibility for any of Vendor's debts, liabilities or other obligations or for the intentional, reckless, negligent or unlawful acts or omissions of Vendor or Vendor's employees or agents. In addition, Vendor may not bind UMMC in any way whatsoever with respect to third parties. If the Agreement requires Vendor to provide on-site services to UMMC, Vendor shall comply with UMMC's applicable policies and procedures for facility access for any persons performing services on-site at UMMC.
 21. **Tax-Exempt Status.** Pursuant to Mississippi law, UMMC is exempt from state sales and use taxes. UMMC will not pay excise, personal property, income, value added, or other similar taxes.
 22. **Equal Opportunity Employer.** During the performance of any contract with UMMC, Vendor agrees to be bound by provisions of Civil Rights Act of 1964 (as amended), the Rehabilitation Act of 1973 (as amended), Executive Order 11246, and the Veterans Readjustment Act of 1972 (as amended).
 23. **Employment Protection Act.** Vendor represents and warrants that it will ensure its compliance with the Mississippi Employment Protection Act, Section 71-11-1, et seq. of the Mississippi Code of 1972 (as amended).
 24. **Force Majeure.** In the event of a Force Majeure Event, the non-performing party is excused from whatever performance is prevented by the Force Majeure Event to the extent prevented and satisfying whatever conditions precedent that cannot be satisfied. When the non-performing party is able to resume performance of its obligations under this Addendum or satisfy the conditions precedent to the performing party's obligations, it shall immediately give the performing party written notice to that effect and shall resume performance under this Addendum no later than five (5) working days after the notice is delivered. "Force Majeure Event" means any act or event, whether foreseen or unforeseen, that meets all three of the following tests: (a) The act or event prevents a party in whole or in part from performing its obligations

under this Addendum; or satisfying any conditions to the performing party's obligations under this Addendum; (b) The act or event is beyond the reasonable control of and not the fault of the non-performing party; and (c) The non-performing party has been unable to avoid or overcome the act or event by the exercise of due diligence. A Force Majeure Event excludes economic hardship, changes in market conditions, or insufficiency of funds.

25. **Notice.** Copies of all notices to UMMC shall also be sent to: University of Mississippi Medical Center, Office of the General Counsel, 2500 North State Street, Jackson, MS, 39216, via certified mail, return receipt requested, or overnight courier.
26. **Waiver.** No failure on the part of any party hereto to exercise, and no delay in exercising any right, power or remedy hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any right, power or remedy hereunder preclude any further or other exercise thereof or the exercise of any other right, power or remedy. Any provisions of the Agreement which require UMMC to waive any cause of action it may have against Vendor or any other party on account of any loss/damage insured by an insurance policy are hereby deleted in their entirety.
27. **Execution.** The Agreement and this Addendum may be executed in counterparts, each of which shall be deemed an original, but together shall constitute one and the same instrument. By signing the Agreement and this Addendum, each signatory represents that he or she has the authority to bind his or her respective party to the Agreement and this Addendum.
28. **Governmental Entity.** Vendor recognizes and acknowledges that UMMC, as a political subdivision of the State of Mississippi, is entering the Agreement, including the provisions thereof, only to the extent authorized by Mississippi law, including the opinions of the Mississippi Attorney General. Any provision of the Agreement that is in any respect not authorized by or is inconsistent with Mississippi law, including the opinions of the Mississippi Attorney General, is invalid.
29. **Severability.** If any provision of the Agreement shall be deemed to be invalid or unenforceable for any reason, the remaining provisions shall continue to be valid and enforceable. If a court finds that any provision of the Agreement is invalid or unenforceable, but that by limiting such provision it would become valid and enforceable, then such provision shall be deemed to be written, construed, and enforced as so limited.
30. **Entire Agreement.** The Agreement, this Addendum, and any other documents which may be incorporated therein by reference, constitute the entire agreement of the parties with respect to the subject matter herein. Any other agreements or understandings, whether written or oral, are hereby superseded, with the exception of an NDA or BAA, if any. The terms of the Agreement and this Addendum shall solely govern the rights and obligations of the parties with respect to the subject matter herein. Any modification to the Agreement or this Addendum shall only be effective if it is in writing and signed by a duly authorized representative of Vendor, and an authorized signatory of UMMC.
31. **Additional Information.** Additional information regarding doing business with UMMC, including documents referenced herein, may be found at www.umm.edu/Contracts/Resources-Forms.html.

SPECIAL TERMS APPLICABLE TO SOFTWARE:

32. **Software License.** Vendor grants to UMMC a perpetual, royalty-free, irrevocable license to use for UMMC's internal business only any software which may be installed in the equipment and/or other software provided by Vendor and any associated documentation provided by Vendor to UMMC. UMMC may permit its employees, agents and independent contractors to use the software and any associated Documentation (as defined below).
33. **Software Warranty.** Vendor warrants that (i) the licensed software will perform substantially in accordance with the applicable Documentation (as defined herein) or as represented by Vendor, (ii) it has not inserted any Disabling Code (as defined herein) into the licensed software and

(iii) it will use reasonable commercial efforts consistent with industry standards to scan for and remove any software viruses before installation of the equipment purchased hereunder. Vendor warrants that it has the right to license or sublicense the Software to UMMC for the purposes and subject to the terms and conditions set forth herein. As used in this warranty statement, (i) "Disabling Code" means computer code that is designed to delete, interfere with, or disable the normal operation of the purchased product; provided, however, that code included in the licensed software that prevents use outside of the license scope purchased for the software will not be deemed to be Disabling Code and (ii) "Documentation" means the Vendor user manuals, on-line help functions, technical specifications and user instructions regarding the operation, installation and use of the software as made available by Vendor to UMMC.

34. **Infringement.** (A) Vendor represents that it has full right to sell or license to UMMC the software, the products or the use thereof, and that all such software or products are delivered free of any liens, encumbrances or rightful claim for any infringement of any United States copyright, patent, trade secret or trademark. Vendor further warrants that the licensed software or product will not infringe any patent, copyright, trade secret or trademark. Vendor agrees to indemnify and hold UMMC harmless from any and all third party claims of infringement relating to UMMC's use of the products sold hereunder, including but not limited to paying all defense costs and attorney's fees, and any judgments. (B) If the use of any element of the licensed software is enjoined as a result of any claim arising out of a breach of this warranty, Vendor will, at its option and expense, either secure for UMMC the right to continue to use the allegedly infringing product, or to replace or modify the product so that it is no longer infringing, provided the product continues to materially perform the same function(s) as originally desired by UMMC and otherwise conforms to the warranty hereunder. In the event Vendor fails to do either of the foregoing, Vendor shall refund to UMMC the full purchase price of all products purchased hereunder.
35. **Data Extraction.** Within ninety (90) days of the termination of the Agreement, Vendor agrees to allow UMMC to migrate any stored UMMC data from Vendor's software. Upon expiration or earlier termination of the Agreement, Vendor agrees that UMMC may elect to have Vendor migrate the data to a UMMC computer at no cost to UMMC, or for Vendor to provide the data to UMMC in another form which is acceptable to UMMC at no cost to UMMC.
36. **Accessibility.** Vendor represents and warrants that the software complies with the accessibility guidelines of Section 508 of the Rehabilitation Act of 1973 and the Web Content Accessibility Guidelines (WCAG) Version 2.0 Level AA, and agrees to provide written documentation verifying accessibility, to promptly respond to and resolve accessibility complaints received from UMMC, and to indemnify and hold UMMC harmless in the event of claims arising from inaccessibility.

Accepted and agreed to on behalf of Vendor:

Date: _____

Name: _____

Title: _____

Accepted and agreed to on behalf of
University of Mississippi Medical Center:

Date: _____

Name: _____

Title: _____

END OF SECTION

SECTION 005200
AGREEMENT FORM

1 Part 1 - GENERAL

1.1 DESCRIPTION

- A. For Contracts over \$50,000.00, the Owner will use AIA Document A101-2017, Standard Form of Agreement Between Owner and Contractor, where basis for Payment is a Stipulated Sum, as revised herein, as a part of the Contract Documents.
- B. A copy of this document is on file at the Architect's office. All Bidders shall read and understand the referenced document.
- C. When Contracts do not exceed \$50,000.00, the form of Contract will be a University of Mississippi Medical Center, Standard Purchase Order Agreement, where the basis for payment is a stipulated lump sum.

END OF SECTION

SECTION 006200

STANDARD CONSTRUCTION CONTRACT CERTIFICATE OF INSURANCE

This certificate of insurance neither affirmatively nor negatively amends, extends, or alters the coverage afforded by the policies below.

INSURED: (Contractor's Name & Address)				COMPANIES PROVIDING COVERAGE w/ MID Lic or NAIC #		
				A	#	
PROJECT: (Number, Name & Location)				B	#	
				C	#	
OWNER: The University of Mississippi Medical Center				D	#	
				E	#	
				F	#	
				G	#	
				Companies above must be approved by the MS Ins Dept. at https://www.mid.ms.gov (or most up to date link) per Code & WComp at http://www.mwcc.ms.gov (MID mod'd 041615)		
Type Insurance	Co	Policy Number	Policy Period	Coverage and Minimum Amount		
General Liability Commercial General Liability				General Aggregate	\$ 1,000,000	
				Products Comp/Ops (Aggregate)	\$ 1,000,000	
				Personal Injury (Per Occurrence)	\$ 500,000	
				BI & PD (Per Occurrence)	\$ 500,000	
				Fire Damage (Per Fire)	\$ 50,000	
				Medical Expense (Per Person)	\$ 5,000	
Owners/Contractors Protective Liability				General Aggregate	\$ 1,000,000	
				Per Occurrence	\$ 500,000	
Automobile Liability				Bodily Injury/Property Damage Combined Single Limit (Per Occurrence)	\$ 500,000	
				OR	Bodily Injury (Per Person)	\$ 250,000
					Bodily Injury (Per Accident)	\$ 500,000
				Property Damage (Per Occurrence)	\$ 100,000	
* Excess Liability (Umbrella on projects over \$500,000)				Aggregate	\$ 1,000,000	
				Per Occurrence	\$ 1,000,000	
Workers' Compensation (As required by Statute) Employers' Liability				Accident (Per Occurrence)	\$ 100,000	
				Disease-Policy Limit	\$ 500,000	
				Disease-Per Employee	\$ 100,000	
Property Insurance (not required when project is demolition ONLY – required for ALL other projects including paving)				OR	Builders' Risk Installation Floater	Must be equal to Value of Work
Other						
Certification: I certify that these policies (subject to their terms, conditions and exclusions) have been (1) issued to the Insured for the coverages and at least the amounts as indicated by companies licensed in Mississippi; (2) countersigned by a Mississippi Licensed Agent; and (3) endorsed to require the company to give thirty (30) days written notice to the Owner prior to cancellation or non-renewal of above.						
Producing Agent: (Name, Address and Telephone)						
				(Signature)	(Date) MID Lic # or countersign below	
				(Name and Title of Authorized Representative) (typed)		
				Agent must be approved by the MS Ins Dept. or countersign https://www.mid.ms.gov		

Check if Mississippi Licensed Agent OR Countersign by Mississippi Licensed Agent _____ MID Lic # _____

END OF SECTION

SECTION 007200
GENERAL CONDITIONS

1 PART 1 - GENERAL

1.1 DESCRIPTION

- A. The General Conditions for this Project are the General Conditions of the Contract for Construction, AIA Document A201-2017 of the American Institute of Architects, as revised by Section 007300. If the General Conditions are not bound in this volume, then they are incorporated by reference as though fully written herein.
- B. Contractors are presumed to be familiar with this document. A copy may be obtained from the Architect or examined in the Architect's office.
- C. All persons intending to provide goods or services in connection with this Work are required to read and understand the referenced document prior to proceeding.
- D. See Section 007300 - Supplementary Conditions. In the event of a conflict between the General Conditions of the Contract for Construction, AIA Document A201-2017 and Section 007300, Section 007300 shall control even if the conflicting provision in the General Conditions of the Contract for Construction, AIA Document A201-2017 is not expressly deleted or revised by reference in Section 007300.

END OF SECTION

SECTION 007300

SUPPLEMENTARY CONDITIONS

GENERAL DESCRIPTION

The following Supplementary Conditions modify the "General Conditions of the Contract for Construction," AIA Document A201-2017. Where a portion of the General Conditions is modified or deleted by the Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect. In the event of a conflict between the General Conditions of the Contract for Construction and Section 007300, Section 007300 shall control even if the conflicting provision in the General Conditions of the Contract for Construction is not expressly revised or deleted by reference in Section 007300.

The General Conditions may also be supplemented or amplified elsewhere in the Contract Documents by provisions located in, but not necessarily limited to, Division 1 of the Specifications.

SUPPLEMENTS

ARTICLE 1 - GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

Delete the last sentence in Article 1.1.1 and insert the following:

The Contract Documents shall include the Advertisement for Bids, Instructions to Bidders, Proposal Form, the plans, the specifications, including Divisions 0 through _____, all Addenda and modifications to the plans and/or specifications, the Agreement between Owner and Contractor, the performance and payment bonds, the notice to proceed and any executed change orders. Information and documentation pertaining to soil investigation data, laboratory investigations, soil borings, and related information included herein are not part of the Contract Documents. In the event of a conflict between the provisions of Division 0 and any other section of the Contract Documents, such other section(s) shall govern.

1.1.5 THE DRAWINGS

Add the following to the end of Article 1.1.5:

Large scale drawings shall govern over small scale drawings where there are differences or conflicts between such drawings. Where the word "similar" appears on the plans, it shall not be interpreted to mean "identical" and shall require the Contractor to coordinate the actual conditions and dimensions of the location where the "similar" conditions are shown to occur.

1.1.8 Delete Article 1.1.8 in its entirety.

1.1.9 MISCELLANEOUS DEFINITIONS

Add the following:

The term "products" as used in these Supplementary Conditions includes materials, systems and equipment.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.4 Add the following Article 1.2.4:

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

1.2.5 Add the following Article 1.2.5:

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

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

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

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

Generally, portions of the Contract Documents written in longhand take precedence over typed portions, and typed portions take precedence over printed portions.

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

ARTICLE 2 - OWNER

2.1 The Owner is The University of Mississippi Medical Center, 2500 North State Street, Jackson, Mississippi.

The Owner's representative is Brian Reddoch, Director of Construction, or as designated by UMMC.

2.2 Evidence of the Owner's Financial Arrangements

Delete Article 2.2 in its entirety.

2.3 Information and Services Required of the Owner

2.3.1 Delete Article 2.3.1 in its entirety.

2.3.2 Add the following after the last sentence of Article 2.3.2:

The term "Architect", "Engineer" or "Design Professional" as used in the Contract Documents refers to _____.

2.3.4 Delete Article 2.3.4 in its entirety.

2.3.6 Delete Article 2.3.6 in its entirety and insert the following:

2.3.6 The Contractor will be furnished free of charge six (6) copies of the plans and specifications, including all Addenda. Additional sets will be furnished at the cost of reproduction, postage and handling.

2.4 OWNER'S RIGHT TO STOP THE WORK

2.4 Delete Article 2.4 in its entirety and insert the following:

If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents as required by Article 12.2 or fails to carry out Work in accordance with the Contract Documents or fails to perform any of its obligations under the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated. However, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Article 6.1.1.

The rights and remedies under this Article 2.4 are in addition to and do not in any respect limit any other rights of the Owner, including its rights under Articles 2.5 and 14.

ARTICLE 3 - CONTRACTOR

3.1 GENERAL

3.1.1 Add the following at the end of Article 3.1.1:

The relationship of Contractor to Owner shall be that of independent contractor, and nothing in the Contract Documents is intended to nor should it be construed as creating any other relationship, expressed or implied, between Owner and Contractor.

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.5 Add the following Article 3.2.5:

Contractor, for itself and its subcontractors, acknowledges that the construction premises are restricted and that access is affected by the location of the Project, by the facilities surrounding the Project, and by other construction either being performed or proposed to be performed during performance of this Contract. Contractor, for itself and its subcontractors, acknowledges that such limitations and restrictions in space and accessibility have been taken into account in its Contract Sum and its Progress Schedule.

Utility Disconnection and/or Relocation: During the examination of the site, Bidders shall identify all utilities that must be disconnected and/or relocated to allow the orderly progress of the Work.

Allow up to 45 days for such activity in Contractor's progress schedule required by Section 013100 or 013110, whichever applies, from the date of request for disconnection and/or relocation of such utilities to completion of such activity.

No time extension will be allowed if Contractor fails to give timely notice of the need for utility disconnection and/or relocation and Contractor is unable to timely perform the Work dependent upon such disconnection and/or relocation or if the date(s) included in the Contractor's progress schedule for disconnection and/or relocation are inadequate.

Contractor shall coordinate the disconnection and/or relocation of utilities with the Owner. The dates which Contractor includes in its progress schedule for utility disconnection and/or relocation are subject to coordination with Owner's operation requirements and Owner's acceptance of such dates, which acceptance will not be unreasonably withheld.

The utilities that may need to be disconnected or relocated may include, but are not limited to, medical gases, water (steam, heated, chilled, domestic and fire), power and communications (telephone and data).

3.2.6 Add the following Article 3.2.6:

The Owner is entitled to deduct from the Contractor's Applications for Payment amounts paid to the Architect for evaluating and responding to the Contractor's requests for information that are not prepared in accordance with the Contract Documents or where the requested information is available to the Contractor for a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

3.4 LABOR AND MATERIALS

3.4.2 Add the following to the end of Article 3.4.2:

Some Sections of the Specifications may not allow "or equal" substitution of materials, products or equipment. Where "or equal" substitution is allowed the request for "or equal" substitution will only be considered if made in strict accordance with the requirements of Section 016000.

3.4.4 Add the following Article 3.4.4:

Contractor represents that it has independently investigated, considered and understands the labor conditions in the area surrounding the Project and acknowledges that such conditions may impact the Contractor's cost and/or time of performance of the Contract. Therefore, Contractor further represents that the Contract Price is based upon Contractor's independent investigations into such labor conditions and that the Contract time is reasonable and the date of Substantial Completion is obtainable. As a result, Contractor assumes the risk of increased costs, if any, incurred by it arising out of or related to such labor conditions and acknowledges that Contractor and its surety will reimburse Owner for any additional costs Owner incurs arising out of or related to such labor conditions.

3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

3.7.1 Delete Article 3.7.1 in its entirety and insert the following:

The Contractor shall secure and pay for the building permit and all other permits, fees, licenses, inspections and all other approvals and charges necessary for proper execution and completion of the Work.

3.7.2 Delete Article 3.7.2 in its entirety and insert the following:

At no additional cost to the Owner, the Contractor shall comply with all laws, statutes, ordinances, building codes, safety requirements, rules and regulations of whatever nature that apply to the Project, whether enacted or adopted before or after bid opening. If the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Architect and Owner in writing.

3.7.3 Delete the words "knowing it to be" from Article 3.7.3.

3.9 SUPERINTENDENT

3.9.1 Add the following to the end of Article 3.9.1:

The Contractor shall also employ a competent project manager who shall be primarily responsible for the Contractor's home office activities in connection with the Contract.

3.9.2 Add the phrase "and project manager" to the end of the first sentence and to the end of subpart (1) of the second sentence.

3.9.3 Delete Article 3.9.3 in its entirety and insert the following:

After Owner's approval of the project manager and superintendent, they shall not be replaced by the Contractor without the Owner's prior written consent, which consent is required unless the Contractor submits proof satisfactory to the Owner that the superintendent and/or the project manager should be terminated by the Contractor for cause.

3.10 CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES

3.10.1 Delete Article 3.10.1 in its entirety and insert the following:

The Contractor shall prepare and submit the Preliminary Schedule and the Progress Schedules as required by and within the times prescribed by Sections 013100 or 013110, whichever applies.

3.10.2 Delete Article 3.10.2 in its entirety and insert the following:

In accordance with Section 013400, Part 1.1.B, the Contractor shall prepare and submit, for the Architect's approval, a separate Schedule of Submittals which is coordinated with the Contractor's Progress Schedule.

The Schedule of Submittals shall be updated monthly and submitted to Architect with Contractor's Application for Payment. Receipt of Contractor's updated monthly submittal schedule shall be a condition precedent to Owner's obligation to pay Contractor.

3.10.3 Delete Article 3.10.3 in its entirety and insert the following:

Time being of the essence, the Contractor shall perform the Work in accordance with the most recent schedule submitted to and approved by the Owner and Architect.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.12.6 Add the following to the end of Article 3.12.6:

In reviewing Shop Drawings, Product Data, Samples and similar submittals the Architect shall be entitled to rely upon the Contractor's representation that such information is correct and accurate.

- 3.12.9 Add the following to the end of Article 3.12.9:

The Architect's review of the Contractor's submittals will be limited to examination of an initial submittal and one (1) resubmittal. The Architect's review of additional submittals will be made only with the consent of the Owner after notification by the Architect. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for evaluation of such additional resubmittals.

3.18 INDEMNIFICATION

- 3.18.1 Add the word "defend," before the word "indemnify" in the first line, add the words "or nonperformance" after the word "performance" in the third line and delete the phrase which begins "provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself)," to the end of the sentence and insert the phrase "and/or the Contractor's acts or omissions."

ARTICLE 4 - ARCHITECT

4.2 ADMINISTRATION OF THE CONTRACT

- 4.2.10 Delete Article 4.2.10 in its entirety.

ARTICLE 5 - SUBCONTRACTORS

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

- 5.2.1 Delete Article 5.2.1 in its entirety and insert the following:

Contractor shall submit a listing of subcontractors and suppliers used by Contractor and included in the Contract Sum for each subcontractor and supplier whose bid or quote exceeds \$50,000.00 within three (3) business days of Owner's request or three (3) business days before the preconstruction conference if not requested earlier.

- 5.2.3 Delete Article 5.2.3 in its entirety and insert the following:

The Contractor shall make no substitution of any subcontractor, supplier, person or entity, listed by the Contractor as required by Sections 002113, Part 1.10.C and 007300, Article 5.2.1, without the Owner's written consent. The Contractor's unauthorized substitution of any subcontractor, supplier, person or entity shall entitle the Owner to reject the work of such subcontractor and/or the materials, product or equipment furnished by such supplier as nonconforming and require removal and replacement at no additional cost to Owner.

ARTICLE 6 - CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

Delete Articles 6.1, including 6.1.1, 6.1.2, 6.1.3, 6.1.4 in their entirety and insert the following:

The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces and to award separate contracts either in connection with other portions of the Project or other construction or operation on the site. In such event, the Contractor shall coordinate its activities with those of the Owner and of other contractors so as to facilitate the

general progress of all work being performed by all parties. Cooperation will be required in the arrangement for the storage of materials, and in the detailed execution of the Work.

The Contractor, including his subcontractors, shall keep informed of the progress and the detailed work of the Owner or other contractors and shall immediately notify the Architect in writing of lack of progress or delays by other contractors which are affecting Contractor's Work. Failure of Contractor to keep informed of the progress of the work of the Owner or other contractors and/or failure of Contractor to give prompt written notice of lack of progress or delays by the Owner or other contractors shall be deemed to be acceptance by Contractor of the status of progress by other contractors for the proper coordination and completion of Contractor's Work. If, through acts or neglect on the part of the Contractor, the Owner or any other contractors or subcontractor shall suffer loss or damage or assert any claims of whatever nature against the Owner, the Contractor shall defend, indemnify and hold harmless the Owner from any such claims or alleged damages, and the Contractor shall resolve such alleged damages or claims directly with the other contractors or subcontractors.

If, through acts or neglect on the part of the Contractor, the Owner is delayed in performing other work that is identified in this Contract, then the Contractor shall be liable for the per diem liquidated damages set forth in Section 007300, Article 9.11, for each day that completion of such other work is delayed by the Contractor.

6.2 MUTUAL RESPONSIBILITY

6.2.3 Delete Article 6.2.3 in its entirety.

ARTICLE 7 - CHANGES IN THE WORK

7.1 GENERAL

7.1.3 Add the following to the end of Article 7.1.3:

Except as permitted in Article 7.3, a change in the Contract Sum or the Contract Time shall only be accomplished by written change order. Therefore, the Contractor acknowledges that it is not entitled to a change in the Contract Sum or the Contract Time in the absence of a written change order on the basis of the course of conduct or dealings between the parties and/or the Owner's express or implied acceptance of alterations or additions to the Work and/or the Owner has been unjustly enriched by the Contractor's Work or any other basis otherwise allowed by law or the facts and Contractor agrees that any such extra or changed work was performed by it as a volunteer.

7.2 CHANGE ORDERS

7.2.2 Add the following Article 7.2.2:

Contractor's execution of a Change Order constitutes a final settlement of the Contract Sum and the Contract Time for all matters relating to or arising out of the change in the Work that is the subject of the change order including, but not limited to, all direct and indirect costs associated with such change, all extended direct job site and home office overhead expenses and any and all delay and impact cost for the change, whether alone or in combination with other changes, including any impact, ripple or cumulative effect resulting therefrom, if any.

7.2.3 Add the following Article 7.2.3:

Adjustments to the Contract Sum by Change Order shall be based upon one of the methods set forth in Articles 7.3.3.1, 7.3.3.2, 7.3.3.3 or 7.3.3.4, as appropriate, with overhead and profit as allowed by Section 012050, Part 1.9.A.

7.2.4 Add the following Article 7.2.4:

All requests for Change Orders must comply with Section 012050.

7.3 CONSTRUCTION CHANGE DIRECTIVES

Delete Section 7.3 in its entirety:

ARTICLE 8 - TIME

8.1 DEFINITIONS

8.1.3 Add the phrase "and Owner" after the word "Architect."

8.2 PROGRESS AND COMPLETION

8.2.1 Add the following to the end of the second sentence:

and that the Contractor is fully capable of properly completing the Work within the Contract Time.

8.3 DELAYS AND EXTENSIONS OF TIME

Delete Articles 8.3.1, 8.3.2, and 8.3.3 in their entirety and insert the following:

8.3.1 If the Contractor is delayed, hindered or impeded at any time in the progress of the Work for any reason or by any alleged act or neglect of the Owner or the Architect, or by any employee of either or by a separate Contractor employed by the Owner, or by changes ordered in the scope of the Work, or by other causes beyond the Contractor's control, then the Contract Time may be extended by Change Order for such reasonable time as is agreed to by the Owner. However, to the fullest extent permitted by law, and notwithstanding any other provisions in the Contract Documents, the Owner and its agents and employees shall not be liable for any damages for delay whether for direct or indirect costs, extended home office overhead, idle or inefficient labor or equipment, cost escalations, or monetary claims of any nature arising from or attributable to delay by any cause whatsoever. The Contractor's sole and exclusive right and remedy for delay by any cause whatsoever is an extension of the Contract Time but no increase in the Contract Sum.

8.3.2 No delay, interference, hindrance or disruption, from whatever source or cause, in the progress of the Contractor's Work shall be a basis for an extension of time unless the delay, interference, hindrance or disruption is (1) without the fault and not the responsibility of the Contractor, its subcontractors and suppliers and (2) directly affects the overall completion of the Work as reflected on the critical path of the Contractor's updated and accepted progress schedules. The Contractor expressly agrees that the Owner shall have the benefit of any float in the schedule and delay to construction activities which do not affect the overall completion of the Work does not entitle the Contractor to any extension in the Contract Time.

8.3.3 Any claims by the Contractor for an increase in Contract Time must follow the procedures as set forth in Section 007300, Article 15.1.6, including, but not limited to the requirement that the Contractor give prompt written notice of any claim for an extension of Contract Time within twenty-one (21) days after occurrence of the event giving rise to such claim.

8.3.4 If the Contractor submits a schedule indicating or otherwise expressing an intent to complete the Work earlier than the Contract Time provided for in the Contract, then the Owner owns the float

in the Contractor's schedule, consisting of the difference between the Contractor's scheduled completion date and the Contract Time and, as a result, the Owner shall have no liability to the Contractor for any delay to the Contractor prior to the expiration of the Contract Time, even if due to the fault of the Owner.

- 8.3.5: Weather Delays: The Contractor agrees that normal weather occurrences and disruption to construction activities are included in the schedule. Weather occurrences or delays beyond normal are defined as days beyond the rain day average for each month as published by the National Oceanic and Atmospheric Administration (NOAA). Impacted days may be determined by the occurrence of weather events (rain) that occurred in excess of the average as indicated by NOAA.

The Contractor is responsible for providing the NOAA data, NOAA average, and the observed deviation in excess of the average as defined by NOAA for the Jackson, MS area. The weather data is to be received monthly with the Application for Payment.

All requests for time extensions shall be made monthly in writing with the Application for Payment. No monetary change in the contract value is considered due to impacted days. The Owner reserves the right to review any requests for consideration of value for extenuating circumstances by the Contractor in regard to schedule and value. The Owner is not obligated under this review for additional compensation as per Article 15.1.6.2. The Contractor may be granted a time extension due to weather only when 1) actual weather days exceed the number of days listed under NOAA averages, 2) the available Total Float is zero or less, and 3) the Weather Day causes an actual delay to the Substantial Completion date of the project by impacting one or more planned activities on the longest path of the approved schedule.

ARTICLE 9 - PAYMENTS AND COMPLETION

- 9.2 Delete the phrase "before the first Application for Payment" and replace with "at the preconstruction conference" per Section 012000, Part 1.4.A.

9.3 APPLICATION FOR PAYMENTS

- 9.3.1 Add the following to the end of Article 9.3.1:

The form of Application for Payment will be the current edition of the AIA Document G702, Application and Certification for Payment, supported with AIA Document G703, Continuation Sheet.

- 9.3.1.3 Add the following Article 9.3.1.3:

In any contract awarded by the State of Mississippi or any agency, unit or department of the State of Mississippi, or by any political subdivision thereof, the amount of retainage that may be withheld is governed by Mississippi law.

- 9.3.2.1 Add the following Article 9.3.2.1:

Payment for materials stored at some location other than the Project site may be approved by the Architect and the Owner upon the Contractor's compliance with the following requirements:

- .1 An acceptable Lease Agreement between the Contractor or one of its subcontractors or suppliers and the owner of the land, or building, where the materials are stored covering the specific area where the materials are located.
- .2 Consent of Surety or other acceptable bond to cover the materials stored off-site.
- .3 All Perils Insurance coverage for the full value of the materials stored off-site.

- .4 A Bill of Sale from the Manufacturer to the Contractor for the stored materials.
- .5 A complete list and inventory of materials manufactured, stored and delivered to the storage site and of materials removed from the storage site and delivered to the Project.
- .6 A review by the Architect of the materials stored off-site prior to release of payment.
- .7 Proof of payment of stored materials verified by the supplier must be submitted to the Architect within thirty (30) days of the Application for Payment on which payment for said materials was made. If proof of payment is not submitted within thirty (30) days, then payment for said materials will be deducted from the next application for payment and withheld until proof of payment is received.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

- 9.5.1.7 Delete the word "repeated."

9.6 PROGRESS PAYMENTS

- 9.6.1 Delete Article 9.6.1 in its entirety and insert the following:

Subject to the conditions of the Contract, the Owner shall make payment to the Contractor in the amount certified within thirty (30) days after receipt of Certificate for Payment from the Architect. Payment shall not be considered late until 30 days after Owner's receipt of Certificate for Payment from the Architect, assuming Contractor has complied with all conditions precedent to payment, including but not limited to, the following:

The Owner has no obligation to make payment to the Contractor under the Contract unless the Contractor complies with the following conditions precedent to payment:

- a. The Contractor submits the list of proposed materials, equipment or product and such submittals as required by Section 016000, Part 1.5.A to obtain approval of and payment for such materials, equipment and/or products;
- b. The Contractor submits three (3) copies at the preconstruction conference of the proposed Schedule of Values required by Sections 007300, Article 9.2 and 012000, Part 1.4.A;
- c. The Contractor complies with all requirements of Section 012010, including the requirement to submit two (2) draft copies of the Application for Payment in accordance with Section 012010; and
- d. With each subsequent Application for Payment, the Contractor submits an updated progress schedule and an updated schedule of submittals as required by Sections 013100 or 013110, whichever applies.

A fixed date for submittal of Contractor's Application for Payment will be established at the preconstruction conference. Any Application not filed on or before the date agreed upon between Owner, Contractor and Architect will not be approved or processed until the following month.

- 9.6.7 Delete the word "Unless" from the first sentence and insert the phrase "Whether or not."

Add the following to the end of Article 9.6.7:

The amount retained by the Contractor from each payment to each Subcontractor and material supplier shall not exceed the percentage retained by the Owner from the Contractor for the Subcontractor's Work.

9.7 FAILURE OF PAYMENT

9.7 In the first sentence, delete the words "or awarded by binding dispute resolution".

9.8 SUBSTANTIAL COMPLETION

9.8.1 Delete Article 9.8.1 in its entirety and insert the following:

Substantial completion for purposes of this Contract and § 31-5-25, Mississippi Code, occurs only upon Contractor's compliance with the following conditions precedent: (a) the Contractor furnishes to the Architect all close-out documents required by the Contract Documents, including Sections 017000 and 017800, in a form satisfactory to the Architect and the Owner, (b) the Contractor furnishes the manufacturers' certifications and/or warranties required by the Contract Documents, including Section 017100; (c) the Contractor furnishes the Guarantee of Work set forth herein below; (d) the Architect certifies that the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended purpose; and (e) the Contractor executes the Certificate of Substantial Completion which constitutes the Contractor's representation set forth in Section 007300, Article 9.8.5.

The Guarantee of Work shall be submitted as a separate document signed by Contractor and Contractor's Surety and shall state the following:

Contractor and Contractor's Surety hereby guarantee that all Work performed on the Project is free from defective and/or nonconforming materials and workmanship and that for a period of one year from the date of substantial completion or such longer period of time as may be called for in the Contract Documents for such portions of the Work, Contractor or its Surety will repair and/or replace any defective and/or nonconforming materials and workmanship in accordance with the requirements of the Contract Documents.

9.8.2.1 Add the following Article 9.8.2.1:

The Contractor shall be responsible for the costs of inspections made by the Architect, including any and all other related expenses incurred by the Architect which are not otherwise required by Articles 4, 9.8.3 and 9.10.1 of the General Conditions.

The costs of the Architect's additional services shall be deducted by the Owner from the Contractor's Application for Payment submitted after the Owner's receipt of the Architect's statement for such services. These costs are not the result of Contractor's failure to timely complete the Contract within the specified time and, therefore, such costs are in addition to and not a part of the liquidated damages calculation.

9.8.5 Add the following to the end of Article 9.8.5:

Contractor's execution of the Certificate of Substantial Completion constitutes Contractor's representation that the items on the list accompanying the Certificate can and will be completed by Contractor and its subcontractors within thirty (30) days of Contractor's execution of the Certificate. Based upon this representation by Contractor and upon the acknowledgment of the Architect that the listed items remaining can be completed within thirty (30) days, the Owner agrees to execute the Certificate of Substantial Completion. If Contractor fails to complete the items on the list within thirty (30) days of Contractor's execution of the Certificate, then the Owner, at its option and without prejudice to any other rights or remedies it may have under this Contract or otherwise and without notice to Contractor or Surety, may proceed to have same, or

any part, completed and to deduct the reasonable costs thereof from the amounts then due or thereafter to become due to Contractor.

9.8.6 Add the following Article 9.8.6:

Upon the Owner's acceptance of the Work as substantially complete and upon Contractor's compliance with all conditions precedent to substantial completion as stated in Section 007300, Article 9.8.1 and upon application by the Contractor, the Owner will pay to the Contractor all retainage held by the Owner less an amount equal to the greater of (a) two percent (2%) of the Contract Sum, or (b) two hundred percent (200%) of the estimated cost of the Work remaining to be performed by the Contractor in accordance with the Architect's determination. Final payment, including all retainage, shall be made at the time and in the manner provided for final payment in accordance with the provisions of Article 9.10 and the additional conditions precedent to final acceptance and payment set forth in Section 007300, Article 9.8.

9.9 PARTIAL OCCUPANCY OR USE

9.9.1.2 Add the following Article 9.9.1.2:

The Owner's occupancy or use of any completed or partially completed portions of the Work shall not affect Contractor's obligation to complete incomplete items on the list attached to the Certificate of Substantial Completion within thirty (30) days or within the time fixed in the Certificate if shorter and does not waive Owner's right to obtain completion of incomplete items at Contractor's expense upon Contractor's failure to timely complete same.

9.11 LIQUIDATED DAMAGES

Add the following Article 9.11:

Time being of the essence of this Contract and a matter of material consideration thereof, a reasonable estimate in advance is established to cover losses incurred by the Owner if the Project is not substantially complete on the date set forth in the Contract Documents. The Contractor and its Surety will be liable for and will pay the Owner the sums hereinafter stipulated as fixed and agreed as liquidated damages for each calendar day for delay until the Work is substantially complete. The Contractor and its Surety acknowledge that the Owner's losses caused by the Contractor's delay are not readily ascertainable and that the amount estimated per day for liquidated damages is reasonable and is not a penalty. The liquidated damages which may be assessed under Article 9.11 are in addition to damages which may be assessed for delays to the Owner prior to substantial completion in accordance with Section 007300, Article 6.1.

The amount established per day for liquidated damages is \$_____.

ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

Add the following to the end of Article 10.1:

The Architect shall not administer the Contractor's performance of its duties and responsibilities under Article 10 (including Articles 10.1 through 10.4) because the initiation, maintenance and supervision of safety precautions and programs is the sole responsibility of the Contractor as means, methods, techniques, sequences and procedures of construction and, therefore, is not part of the Contractor's scope of Work which is to be administered by the Architect.

ARTICLE 11 - INSURANCE AND BONDS

Strike Article 11 and replace with the following:

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
 - .2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
 - .3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
 - .4 Claims for damages insured by usual personal injury liability coverage;
 - .5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
 - .6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
 - .7 Claims for bodily injury or property damage arising out of completed operations; and
 - .8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.
- .9 Liability insurance will include all major divisions of coverage and be on a comprehensive basis including:
1. Premises - operations (including X-C-U).
 2. Independent Contractor's Protective.
 3. Products and completed operations.
 4. Contractual Liability - including specified provisions for the Contractor's obligations under Sections 007200, Article 3.18 and 007300, Article 3.18.
 5. Personal Injury Liability.
 6. Owned, non-owned and hired motor vehicles.
 7. Broad form coverage for property damage.
 8. Owner and Architect will be listed as additional insured on policy

11.1.2 The insurance required by Article 11.1.1 will be written for not less than the amounts indicated in Specification Section 006200 – Standard Construction Contract Certificate of Insurance. If required by law, or if deemed necessary by the Contractor to protect its interests, the Contractor may provide coverage limits in excess of those defined in Section 006200.

Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required

policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be cancelled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. The Owner and Architect will be named as additional insureds on the Contractor's CGL policy and the Contractor's certificate of insurance must state that the Owner and Architect are additional insureds under the referenced CGL policy and that all of Contractor's contractual liabilities, including but not limited to, its indemnity obligations, are covered by such CGL policy. Any language contained on the certificate of insurance form or elsewhere to the contrary is deemed stricken. The certificate of insurance must also state that all of Contractor's contractual liabilities, including but not limited to, its indemnity obligations, are covered. Any terms and conditions contained in the certificate of insurance which are contrary to the Contractor's contractual obligations are hereby stricken from the certificate and do not alter or amend the Contractor's obligation to procure insurance according to the requirements of the Contract. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's Consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

11.1.5 Furnish one copy of the certificate herein required for each copy of the Agreement, specifically setting forth evidence of all coverage required by Article 11. The form of the certificate will be AIA Document G715 or a similar form acceptable to Owner. Furnish to the Owner and Architect, copies of any endorsements that are subsequently issued amending coverage or limits. If the coverages are provided on a claims-made basis, the policy date or retroactive date shall predate the Contract and the termination date of the policy, or the applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment

11.2 OWNER'S LIABILITY INSURANCE

The Contractor will pay for and maintain such insurance as will protect the Owner and Architect from their contingent liability to others for damages because of bodily injury, including death, which may arise from operations under this Contract and other liability for damages which the Contractor is required to insure under any provision of this Contract. Certificate of this insurance shall be filed with the Owner and Architect and will be the same limits set forth in Section 00800, Article 11.1.2.

11.3 PROPERTY INSURANCE

11.3.1 The Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as

provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

- 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, false work, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.
- 11.3.1.2 If the Contractor fails to purchase and maintain such insurance and the Owner is damaged by such failure, then the Contractor shall be liable to the Owner for all such damages incurred by the Owner.
- 11.3.1.3 If the property insurance requires minimum deductibles, the Contractor shall pay the deductible and all other costs not covered because of such deductibles. If the Contractor or insurer increases the required minimum deductibles above the amounts so identified or if the Contractor elects to purchase this insurance with voluntary deductible amounts, the Contractor shall be responsible for payment of the additional costs not covered because of such increased or voluntary deductibles.
- 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.
- 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

11.3.7 WAIVERS OF SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

- 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as

fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10.

11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

11.3.10 The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five (5) business days after occurrence of loss.

11.3.11 In addition to the above, the Contractor shall obtain in the Owner's and Architect's names, and maintain during the same time period, Owner's Protective Liability Insurance and Property Damage Insurance and Public Liability and Property Damage Insurance in the amounts of not less than \$1,000,000 combined single limit, which policies shall cover the operations of the Contractor, and those of its subcontractors to protect the Owner and Architect from loss. This protection is not to be considered as a separate policy by the Contractor, but may be riders to the Contractor's coverage.

11.4 PERFORMANCE BOND AND PAYMENT BOND

11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 - UNCOVERING AND CORRECTION OF WORK

12.2 CORRECTION OF WORK

12.2.2 AFTER SUBSTANTIAL COMPLETION

12.2.2.1 Add the following to the end of Article 12.2.2.1:

Prior to the end of the one-year period, the Architect may schedule a warranty inspection which shall be attended by the Architect, the Owner, the Contractor and all major subcontractors. During this inspection, the parties shall identify all defective and/or nonconforming items and fix a time within which all defective and/or nonconforming items shall be repaired and/or replaced.

12.2.2.1.1 Add the following Article 12.2.2.1.1:

Within the one-year period provided for in the Guarantee of Work required by Article 9.8.1, if repairs or replacement are requested by Owner in connection with the Work which, in the opinion of the Owner, are rendered necessary as a result of the use of materials, equipment or workmanship which are inferior, defective or not in accordance with the Contract Documents, the Contractor and/or its Surety shall promptly, upon receipt of notice from and without expense to the Owner, place in satisfactory condition in every particular, all such Work, correct all defects therein and make good all damages to the building, site, equipment or contents thereof; and make good any work or materials or the equipment and contents of said buildings or site disturbed in fulfilling any such guarantee. If, after notice or within the time agreed upon by the parties at the warranty inspection, the Contractor and/or its Surety fail to proceed promptly to comply with the terms of the guarantee, the Owner may have the defects corrected in accordance with Article 2.5 and the Contractor and its Surety shall be liable for all expenses incurred. All special guarantees applicable to definite parts of the Work stipulated in the Contract Documents shall be subject to the terms of this paragraph during the first year of the life of such special guarantee.

ARTICLE 13 - MISCELLANEOUS PROVISIONS

13.2 SUCCESSORS AND ASSIGNS

13.2.2 Delete Article 13.2.2 in its entirety.

13.5 INTEREST

Delete Article 13.5 in its entirety and insert the following:

Payments due and unpaid under the Contract Documents shall bear interest as provided by applicable Mississippi law.

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

Delete Article 14.1 in its entirety, including Articles 14.1.1, 14.1.2, 14.1.3 and 14.1.4.

14.2 TERMINATION BY THE OWNER FOR CAUSE

14.2.1.1 Delete the word "repeatedly" from Article 14.2.1.1.

14.2.1.3 Delete the word "repeatedly" from Article 14.2.1.3.

Add the following Articles 14.2.1.5, 14.2.1.6 and 14.2.1.7 to 14.2.1:

- .5 fails to achieve Substantial Completion of the Project as described in Article 9.8 within the time stated therein;
- .6 fails to complete the list of items attached to the Certificate of Substantial Completion within the time required;
- .7 fails to meet any other deadline required by the Contract.

Contractor acknowledges that time is of the essence of this Contract and that all deadlines required by the Contract are critical to timely completion of the Contract. Therefore, Contractor agrees that its failure to meet any deadline constitutes a

substantial and material breach of this Contract, entitling the Owner to terminate the Contract.

14.2.2 Delete the phrase "and upon certification by the Architect that sufficient cause exists to justify such action."

14.2.4 Delete the phrase "Initial Decision Maker" and insert the word "Architect".

14.2.5 Add the following Article 14.2.5:

If the Owner terminates the Contract for cause, and it is determined for any reason that the Contractor was not actually in default under the Contract at the time of termination, the Contractor shall be entitled to recover from the Owner the same amount as the Contractor would be entitled to receive under a termination for convenience as provided by Article 14.4. The foregoing shall constitute the Contractor's sole and exclusive remedy for termination of the Contract. In no event shall the Contractor be entitled to special, consequential, or exemplary damages, nor shall the Contractor be entitled to anticipated profits resulting from termination of this Contract.

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

14.4.3 Add after the last sentence of Article 14.4.3: "The Contractor shall not be entitled to receive any payment for either overhead or profit on work not performed."

ARTICLE 15 - CLAIMS AND DISPUTES

15.1.2 Time Limits on Claims

Delete the phrase "in accordance with the requirements of the binding dispute resolution method selected in the Agreement" from Article 15.1.2.

15.1.3.1 NOTICE OF CLAIMS

Delete the phrases "and to the Initial Decision Maker" and "if the Architect is not serving as the Initial Decision Maker" from the first sentence.

15.1.6.1 CLAIMS FOR ADDITIONAL TIME

Delete the second sentence in its entirety and insert the following:

Claims for increases in the Contract Sum for delays are precluded by Section 007300, Article 8.3.

15.1.6.2 Delete Article 15.1.6.2 in its entirety.

15.1.7 WAIVER OF CLAIMS FOR CONSEQUENTIAL DAMAGES

Delete Article 15.1.7 in its entirety.

15.2 INITIAL DECISION

Delete Article 15.2 in its entirety, including Articles 15.2.1 to 15.2.8.

15.3 MEDIATION

Delete Article 15.3 in its entirety, including Articles 15.3.1 to 15.3.4.

15.4 ARBITRATION

Delete Article 15.4 in its entirety, including Articles 15.4.1 to 15.4.3 and insert the following:

Wherever "mediation" and/or "arbitration" are referenced in the Contract, the words are deleted and replaced with the word "litigation".

15.4.4 CONSOLIDATION OR JOINDER

Delete Article 15.4.4 in its entirety, including Articles 15.4.4.1 to 15.4.4.3.

END OF SECTION

DIVISION I

GENERAL REQUIREMENTS

SECTION 011000
SUMMARY OF WORK

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Work by Owner.
- B. Owner furnished products.
- C. Contractor use of site and premises.
- D. Work Sequence.
- E. Owner occupancy.

1.2 WORK BY OWNER

- A. Items noted "NIC" (Not in Contract), will be furnished and installed by Owner.

1.3 OWNER FURNISHED PRODUCTS

- A. Products furnished to the site and paid for by Owner:

- 1. OFOI - Owner Furnished Owner Installed.
- 2. OFCI - Owner Furnished Contractor Installed.

- B. 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.

- C. Contractor's Responsibilities:

- 1. Review Owner reviewed shop drawings, product data, and samples.
- 2. Receive and unload products at site; inspect for quantity and condition, jointly with Owner.
- 3. Handle, store, and protect products.
- 4. Install products in accordance with the plans and specifications.
- 5. Repair or replace items damaged after receipt and be solely responsible and liable for such products after receipt.

1.4 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings or designated by Owner.
- B. Time Restrictions for Performing Interior Exterior Work: Provide Notice.

1.5 OWNER OCCUPANCY

- A. The Owner will occupy the premises during entire period of construction for the conduct of normal operations.
- B. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations.
- C. Schedule the Work to accommodate this requirement.
- D. Utility Disconnection and/or Relocation: During the examination of the site, Bidders shall identify all utilities that must be disconnected and/or relocated to allow the orderly progress of the Work. Allow up to 45 days for such activity in Contractor's progress schedule required by Section 013100 or 013110, whichever applies, from the date the request is received by Owner, for disconnection and/or relocation of such utilities to completion of such activity.

No time extension will be allowed if Contractor fails to give timely notice of the need for utility disconnection and/or relocation and Contractor is unable to timely perform the Work dependent upon such disconnection and/or relocation or if the date(s) included in the Contractor's progress schedule for disconnection and/or relocation are inadequate.

Contractor shall coordinate the disconnection and/or relocation of utilities with the Owner. The dates which Contractor includes in its progress schedule for utility disconnection and/or relocation are subject to coordination with Owner's operation requirements and Owner's acceptance of such dates, which acceptance will not be unreasonably withheld.

The utilities that may need to be disconnected or relocated may include, but are not limited to, medical gases, water (steam, heated, chilled, domestic and fire), power and communications (telephone and data).

1.6 WORK SEQUENCE

- A. All work shall be performed during designated operational hours. Work performed after designated hours shall be approved in advance by the Professional and Owner prior to performance. Work performed after designated hours, without prior approval, may be deemed inferior and subject to replacement at the Contractor's expense. After hours work approval shall be requested 48 hours prior to anticipated activity.

Note to Professional: This section must be modified for each projects requirements. Definition of "designated operational hours" and "off hour operations" must be defined. Weekend, infectious control, noise, demolition will determine the required work sequence as a guide for the Contract.

2 PART 2 - PRODUCTS

Not Used

3 PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 011050

COORDINATION

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Coordination.
- B. Project Coordinator.
- C. Superintendent.
- D. Field engineering.

1.2 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions of accommodating items installed later.
- B. Verify that utility requirement characteristics of operations equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Locate utilities affecting or impeding construction and coordinate utility disconnection and/or relocation as required by Sections 002113, Parts 1.8.B and C, 007300, Article 3.2.5, and 011000, Part 1.5.
- D. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and cleanup of Work of separate Sections in preparation for Substantial Completion.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.3 PROJECT COORDINATORS AND SUPERINTENDENT

- A. Contractor shall designate separate employees as project manager and superintendent, as required by Section 007300, Article 3.9. Prior to beginning work, their names and qualifications will be submitted in writing to the Architect. Upon approval of the Architect and Owner, they will remain until the project is completed and cannot be removed during construction without the written consent of the Owner and Architect.
- B. General Duties of the Project Coordinator:
 - 1. Coordination: Coordinate all submittals required by the Contract.

2. Supervision: Supervise the Contractor's home office activities in connection with the project, including but not limited to, assisting in the preparation of applications for payment and responding to inquiries regarding the project.
3. Assistance: Assist the superintendent in his administration of the Contract.
4. Attend all project meetings as required by Section 013000.

C. Duties of the Superintendent:

1. General Duties:
 - a. Coordination: Coordinate the work of all subcontractors and material suppliers on site and coordinate the work of Contractor and any other Contractor.
 - b. Supervision: Supervise the activities of every phase of work taking place on the project.
 - c. Mechanical/Electrical: Take special care to coordinate the work of plumbing, heating, cooling, and electrical subcontractors.
 - d. Communications: Establish and maintain lines of authority and communication at the job site.
 - e. Location: Be present on the job when work is in progress.
 - f. Schedule and attend all project meetings in accordance with Section 013000.
2. Coordinate requirements of Division One and specifically as follows:
 - a. Cutting and Patching: Supervise and control all cutting and patching.
 - b. Testing: Coordinate all required testing.
 - c. Temporary Facilities and Controls: Allocate, maintain, and monitor all temporary facilities.
 - d. Cleaning: Direct and execute a continuing cleaning program throughout construction, requiring each trade to dispose of their debris.
 - e. Project Record Documents: Maintain up to date project record documents.
 - f. Enforce all safety requirements.

D. Duties of Project Coordinator and/or Superintendent:

1. Interpretations of Contract Documents:
 - a. Consultation: Consult the Architect and Engineer to obtain interpretations.
 - b. Assistance: Assist in resolution of any questions.
 - c. Stop all work not in accordance with the requirements of the Contract Documents.
 - d. Document all interpretations and decisions made which were not clearly indicated in Contract Documents with the Architect.
2. Coordinate requirements of Division One and specifically as follows:
 - a. Cutting and Patching: Supervise and control all cutting and patching.
 - b. Testing: Coordinate all required testing.
 - c. Temporary Facilities and Controls: Allocate, maintain, and monitor all temporary facilities.
 - d. Cleaning: Direct and execute a continuing cleaning program throughout construction, requiring each trade to dispose of their debris.
 - e. Project Record Documents: Maintain up to date project record documents.
 - f. Enforce all safety requirements.

E. Maintain quality control of all work.

F. The MEP subcontractors shall each designate an employee as the electrical/mechanical coordinator in accordance with Section 007300, Article 3.9. These employees may also act as the subcontractors' superintendents or working foremen. Prior to beginning work, the names and qualifications of the electrical/mechanical coordinators for the mechanical and electrical

subcontractors shall be submitted in writing to the Architect. Upon approval by the Architect and Owner, they will remain until their subcontract work is completed and cannot be removed during construction without the written consent of the Owner and Architect.

G. General Duties of MEP Coordinators:

1. Coordination: Take special care to coordinate the work of the mechanical and electrical subcontractors and immediately notify the Architect of any conflicts between the electrical and mechanical contract requirements or any omissions in either.
2. Assistance: Assist the project superintendent in his administration of the mechanical and electrical portions of the work.
3. Attendance: Attend all project meetings as required by Section 013000.
4. Communication: Establish and maintain lines of communication and authority at the project site between the mechanical and electrical forces.
5. Location: Be present at the project site when electrical and/or mechanical work is in progress.

1.4 FIELD ENGINEERING

- A. Employ a Land Surveyor registered in the State of Mississippi and acceptable to the Architect.
- B. The Contractor shall locate and protect horizontal and vertical control and reference points.
- C. The registered Land Surveyor shall physically check the referenced control points and submit a stamped and signed drawing to the Architect showing that the points are in place and in satisfactory condition. No building construction shall take place until this is done.
- D. The Contractor shall have the grid line intersections for the building corners or reference to the corners set and the registered Land Surveyor shall field check the points and notify the Architect that the corners or reference to the corners are located accurately.
- E. The registered Land Surveyor shall be responsible to oversee construction staking throughout the process.
- E. "As Built" drawings will be prepared by a registered Land Surveyor showing exact horizontal and vertical location of any and all underground utilities, pipes, manholes, boxes, etc. discovered or installed during construction and be delivered in AutoCAD (2015 format) and PDF formats. The typical "marking up" of utilities on the original plans is not acceptable. The "As Built" drawings must be determined to be acceptable by the Architect and UMMC.

END OF SECTION

SECTION 011400

ALTERATION PROJECT PROCEDURES

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. General Requirements.
- B. Alterations, Cutting & Protection.
- C. Salvaged Materials.
- D. Products.
- E. Damaged Surfaces.
- F. Transitions.
- G. Cleaning.

1.2 GENERAL REQUIREMENTS

- A. Coordinate work of trades and schedule elements of alterations and renovation work by procedures and methods to expedite completion of the work.
- B. In addition to demolition specified, and that specifically shown, cut, move, or remove items of existing construction necessary to provide access or to allow alterations and new construction as required by Contract.
- C. Patch, repair, and refinish existing items to remain that is in conjunction with new work or must match new work to the specified condition for each materials, with a workmanlike transition to adjacent new items of construction.

1.3 ALTERATIONS, CUTTING, AND PROTECTION

- A. Assign the work of moving, removal, cutting, and patching, to trades qualified to perform the work in a manner to cause least damage to each type of work and provide means of returning surfaces to appearance of new work.
- B. Perform cutting and removal work to remove the minimum necessary and in a manner to avoid damage to adjacent work to remain.
 - 1. Cut finish surfaces such as masonry, tile, plaster, or metals by methods to terminate surfaces in a straight line at a natural point of division.
- C. Perform cutting and patching as specified in Section 011450.
- D. Protect existing finishes, equipment, and adjacent work which is scheduled to remain from damage.
 - 1. Protect existing and new work from weather and extremes of temperature.
 - a. Maintain existing interior work above 60 degrees F.
 - b. Provide weather protection, waterproofing, heat, and humidity control as needed to prevent damage to remaining existing work and to new work.

- E. Provide temporary closure to separate work areas from building occupied by Owner, and to provide weather protection.

2 PART 2 - PRODUCTS

2.1 SALVAGED MATERIALS

- A. Salvage sufficient quantities of cut or removed material to replace damaged work of existing construction, when material is not readily obtainable on current market.
 - 1. Store salvaged items in a dry, secure place on site.
 - 2. Items not required for use in repair of existing work to remain shall be removed from the site.
 - 3. Do not incorporate salvaged or used material in new construction without written approval of the Architect.
 - 4. Verify Owner's salvage with Owner's Representative and deliver to a location agreed upon.

2.2 PRODUCTS FOR PATCHING, EXTENDING, AND MATCHING

- A. General Requirements that Work be Complete:
 - 1. Provide same products or types of construction as that in existing structure, as needed to patch existing work.
 - a. Generally Contract documents will not define products or standards of workmanship present in existing construction. Contractor shall determine products by inspection and any necessary testing and workmanship by use of the existing as a sample of comparison.
 - 2. Present of a product, finish, or type of construction that requires patching, extending or matching shall be performed as necessary to make work complete and consistent to identical standards of quality.

3 PART 3 - EXECUTION

3.1 PERFORMANCE

- A. Patch and extend existing work using skilled mechanics who are capable of matching existing quality of workmanship. Quality of patched or extended work shall be not less than that specified for new work.

3.2 ADJUSTMENTS

- A. Where partitions are removed, patch floors, walls, and ceilings, where required for installation of new materials.
 - 1. Where removal of partitions results in adjacent spaces becoming one, rework floors and ceiling to provide smooth planes without breaks, steps, or bulkheads.
 - 2. Where change of plane occurs, request instructions from Architect as to method of making transition.

3.3 DAMAGED SURFACES

- A. Patch and replace any portion of an existing finished surface which as a result of this construction is found to be damaged, lifted, discolored, or show other imperfections, repair with matching material.
 - 1. Provide adequate support of substrate prior to patching the finish.
 - 2. Refinish patched portions of painted or coated surfaces in a manner to produce uniform color and texture over entire surface.

3.4 TRANSITION FROM EXISTING TO NEW WORK

- A. When new work abuts or finishes flush with existing work, make a smooth and workmanlike transition. Patched work shall match existing adjacent work in texture and appearance.

3.5 CLEANING

- A. Perform periodic and final cleaning as specified in Section 015000 and Section 017000.
- B. At completion of work of each trade, clean area and make surfaces ready for work of successive trades.

END OF SECTION

SECTION 011450

CUTTING AND PATCHING

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Scope: To set forth broad, general conditions covering cutting and patching that applies to everyone and everything on the job.
- B. Execute cutting including excavating, fitting, or patching of work required to:
 - 1. Make several parts fit properly.
 - 2. Uncover work to provide for installation of ill-timed work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to Contract requirements.
 - 5. Install specified work in existing construction.
- C. In addition to Contract requirements, upon Professional's written instructions:
 - 1. Uncover work for observation of covered work.
 - 2. Remove samples of installed materials for testing.
 - 3. Remove work to provide alteration of existing work.
- D. Do not cut or alter work of another Contractor without permission.
- E. Payment of Costs: Costs caused by ill-timed, or defective work, or work not conforming to Contract Documents will be borne by party responsible for ill-timed, defective work, or non-conforming work.

1.2 SUBMITTALS

- A. Submit written request in advance of cutting or alteration which 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 operations element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
- B. Include in request:
 - 1. Identification of Project.
 - 2. Location and description of affected work.
 - 3. Necessity for cutting or alteration.
 - 4. Description of proposed work, and products to be used.
 - 5. Alternative(s) to cutting and patching.
 - 6. Effect on work of Owner or separate Contractor.
 - 7. Written permission of affected separate Contractor.
 - 8. Date and time work will be executed.

2 PART 2 - PRODUCTS

2.1 MATERIALS

- A. Primary Products: Those required for original installation.

- B. Product Substitution: For any proposed change in materials, submit request for substitution under provisions of Section 016000.

3 PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
- B. After uncovering existing work, inspect conditions affecting performance of work.
- C. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

- A. Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.
- B. Provide protection from elements for areas which may be exposed by uncovering work.

3.3 CUTTING AND PATCHING

- A. Execute cutting, fitting, and patching including excavation and fill to complete work.
- B. Fit products together, to integrate with other work.
- C. Provide openings in the work for penetration of mechanical and electrical work.

3.4 PERFORMANCE

- A. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
- B. Employ original installed to perform cutting and patching for weather exposed and moisture resistant elements, and sight-exposed surfaces.
- C. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- D. Restore work with new products in accordance with requirements of Contract Documents.
- E. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- F. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids and annular spaces with appropriate fire rated material, to full thickness of the penetrated element. Refer to specification Section 078400 Firestopping (UMMC) regarding labeling requirements for all penetrations in fire rated assemblies.
- G. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- H. Correct, repair or replace existing services, utilities or items damaged as a result of cutting, patching or demolition immediately in accordance with Owner's requirements and supervision.

- I. Execute excavating and backfilling by methods which prevent damage to other work and prevent settlement. Maintain excavations free of water.

END OF SECTION

SECTION 012000
SCHEDULE OF VALUES

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Format.
- B. Content.
- C. Submittal.
- D. Substantiating Data.

1.2 FORMAT

- A. Submit Schedule of Values using AIA Document G703-2017 - Continuation Sheet for Application and Certificate for Payment, or computer generated form containing similar style, if acceptable to the Design Professional and Owner.
- B. Follow Table of Contents of Project Manual by specification section numbering for listing component parts. Identify each line item by number and title of major specifications section. Break down installed cost with overhead and profit.
- C. Itemize separate line item cost for each of the following general cost items: Performance and Payment Bonds, field supervision and layout, temporary facilities and controls, and all other Division One specification requirements, as appropriate.
- D. Include a separate line item in the Schedule of Values for compliance with Contract Closeout Procedures, including but not limited to the preparation and submission of the Project Record Documents, Operation and Maintenance Data and all other documents required by Section 007300, Article 9.8, Section 017100, Section 017000, and Section 017800 which are required to be submitted to Architect as a condition precedent to Owner's acceptance of the Work as substantially complete.

1.3 CONTENT

- A. List installed value of each item of work and each subcontracted item of work as a separate line item to serve as a basis for computing values for progress payments. Round up values to nearest dollar. Each line item may not exceed \$20,000 unless agreed upon by the Owner.
- B. For each major Subcontract, list products and operations of that Subcontract as separate line items.
- C. Coordinate listings with Progress Schedule as required by Section 013100, Part 1.3.I., and revise in accordance with Section 012050 to reflect authorized change orders.
- D. Components listings shall each include a directly proportional amount of Contractor's overhead and profit.
- E. For items on which payments will be requested for stored products, list sub-values for cost of stored products with taxes paid.
- F. The sum of values listed shall equal total Contract sum.

G. The Schedule of Value line items are to be broken down as agreed upon by Owner & Architect.

1.4 SUBMITTALS

A. Submit three copies of proposed Schedule of Values at the preconstruction conference.

B. Transmit under Contractor's standard transmittal letter. Identify project by title and number.

C. Review and Resubmittal: After Professional's review, if requested, revise and resubmit Schedule of Values in same manner.

D. Schedule of Values must be approved by Owner and Architect at least ten (10) days prior to submittal of first Application for Payment. Submittal and approval of the Schedules of Values by the Owner shall be a condition precedent to the Owner's obligation to make payment to Contractor.

1.5 SUBSTANTIATING DATA

A. When Architect requires substantiating information, submit data justifying line items amounts in question.

2 PART 2 – PRODUCTS
NOT USED.

3 PART 3 – EXECUTION
NOT USED.

END OF SECTION

SECTION 012010

APPLICATIONS FOR PAYMENT

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Procedures for preparation and submittal of Applications for Payment in addition to those contained in Sections 007200, Article 9 and 007300, Article 9.

1.2 FORMAT

- A. AIA Document G702-1992 - Application and Certificate for Payment; AIA Document G703-2017 Continuation Sheet; or, a computer generated form containing similar data, if acceptable to the Design Professional and Owner.

1.3 PREPARATION OF APPLICATIONS

- A. Present required information in typewritten form.
- B. Execute certification by signature of authorized officer.
- C. Use data from approved Schedule of Values prepared in accordance with Section 012000. Provide dollar value in each column for each line item for portion of work performed and for stored products. Do not round cents.
- D. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of Work.
- E. Prepare Application for Final Payment as specified in Section 017000.
- F. Provide Owner with required tax information for vendor "ID" number.

1.4 SUBMITTAL PROCEDURES

- A. Submit two (2) draft copies of each Application for Payment at least five (5) work days before the Project monthly meeting for Architect's review. If acceptable to Architect, a PDF file may be provided for review in lieu of the draft copies.
- B. Submit two (2) copies of each Application for Payment at the Project monthly meeting.
- C. Submit an updated progress schedule and an updated schedule of submittals with each Application for Payment as a condition precedent to Owner's obligation to make payment. See Section 007300, Article 9, for other conditions for payment. Provide a letter indicating if any weather days are claimed for the month. Provide an SWPPP update (as applicable). Lien waivers along with photographs of stored materials billed during the pay period are also to be included.
- D. Per Miss. Code Ann. §31-5-25, Part 2, Contractors shall submit monthly certification to the project architect indicating payments to subcontractors on prior payment requests. Provide an affidavit certifying payment to all subcontractors, as described in and using the language and formatting of the example provided at the end of this specification section.
- E. Payment Period: Submit at intervals stipulated in the Agreement.

F. Submit to Architect at time stipulated in Section 007200, Article 9.3.1.

1.5 SUBSTANTIATING DATA

A. When Architect requires substantiating information, submit data justifying dollar amounts in question.

B. 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.

2 PART 2 - PRODUCTS
NOT USED.

3 PART 3 - EXECUTION
NOT USED.

NOTE: Form of affidavit certifying payment to all subcontractors is provided on the next page.

AFFIDAVIT CERTIFYING PAYMENT
TO ALL SUBCONTRACTORS

THE UNIVERSITY OF MISSISSIPPI MEDICAL CENTER

I acknowledge that, pursuant to Miss. Code Ann. §31-5-25 and H.B. 1562, Laws of 2002, that I am required to submit monthly certification indicating payments to subcontractors on prior payment requests. I, the undersigned Contractor, do hereby certify that I have paid the following amounts to subcontractors for Work which has been performed and incorporated into previous Applications for Payment which were issued and payment received from the Owner on the project listed below. I understand that this document must be submitted on a monthly basis after the submittal, approval and payment of Application for Payment #1. I understand that the UNIVERSITY OF MISSISSIPPI MEDICAL CENTER reserves the right to require me, the undersigned, to provide verification of payment and/or additional information.

Project Name and Number: _____

- Subcontractor: _____ Amount: \$ _____
- Subcontractor: _____ Amount: \$ _____
- Subcontractor: _____ Amount: \$ _____
- Subcontractor: _____ Amount: \$ _____
- Subcontractor: _____ Amount: \$ _____
- Subcontractor: _____ Amount: \$ _____
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- Subcontractor: _____ Amount: \$ _____
- Subcontractor: _____ Amount: \$ _____
- Subcontractor: _____ Amount: \$ _____
- Subcontractor: _____ Amount: \$ _____
- Subcontractor: _____ Amount: \$ _____
- Subcontractor: _____ Amount: \$ _____

(Attach additional list of subcontractors and amounts, if necessary)

Contractor Name and Title: _____

Contractor Certificate of Responsibility Number: _____

Contractor Signature: Date: _____

STATE OF MISSISSIPPI
COUNTY OF _____

SWORN TO AND SUBSCRIBED BEFORE ME, the undersigned notary public,
this the _____ day of _____, 20__.

NOTARY PUBLIC

My Commission Expires:

END OF SECTION

SECTION 012050

CHANGE ORDER PROCEDURES

1 PART 1 - GENERAL

This section is in addition to and supplements the requirements of Section 007200, Article 7 and Section 007300, Article 7.

1.1 SECTION INCLUDES

- A. Submittals.
- B. Change procedures.
- C. Documentation of Change in Contract Sum and Contract Time.
- D. Construction Change Directive.
- E. Stipulated Lump Sum Price change order.
- F. Unit price change order.
- G. Time and material Force account change order.
- H. Execution of change orders.
- I. Correlation of Contractor submittals.

1.2 SUBMITTALS

- A. Submit name of the individual authorized to receive change order documents, and be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.
- B. Change Order Form: AIA Document G701-2017.

1.3 CHANGE PROCEDURES

- A. The Architect may issue a Proposal Request which includes a detailed description of a proposed change with supplementary or revised drawings and specifications, and a change in Contract Time for executing the change. The Contractor will prepare and submit an estimate within 10 days or agreed upon time depending on scope of work.
- B. The Contractor may propose a change by submitting a request for change to the Architect, in accordance with this Section 012050, 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. Document any requested substitutions in accordance with Section 016000.

1.4 DOCUMENTATION OF CHANGE IN CONTRACT SUM/PRICE AND CONTRACT TIME

- A. Maintain an accurate updated Progress Schedule that reflects the status of the Work, the float, the remaining Work to be completed, the effect of the change on the progress of the Work and on the critical path.

- B. Document each request for a change in cost or time with sufficient data to allow evaluation of the request, including but not limited to:
1. Quantities of products, labor, and equipment.
 2. Justification for any change in Contract Time.
 3. Credit for deletions from Contract, similarly documented and computed.
- C. Contractor shall certify that it has considered other change orders granted to it and/or requested by it and it has not included costs for General Conditions (including its Project Superintendent) which are already in the Contract Sum or have been granted or which are being requested as part of another Change Order.
- 1.5 STIPULATED SUM CHANGE ORDER
- A. Based on Proposal Request and Contractor's fixed price quotation, or Contractor's request for a Change Order as approved by Architect.
- 1.6 UNIT PRICE CHANGE ORDER
- A. For pre-determined unit prices and quantities, the Change Order will be executed on a fixed unit price basis.
- B. For unit costs or quantities of units of work which are not pre-determined, execute Work under a Field Order, with a not to exceed limit included as a component of the proposal.
- C. Changes in Contract Sum or Contract Time will be computed as specified for Time and Material Change Order.
- 1.7 TIME AND MATERIAL CHANGE ORDER
- A. Submit itemized documentation to support request for Change Order.
- B. Architect will review the documentation and determine the change allowable in Contract Sum and Contract Time as provided in the Contract Documents.
- 1.8 FIELD ORDERS
- A. Architect may issue a document, approved by the Owner's representative, instructing the Contractor to proceed with a Change in the Work, for subsequent inclusion in a Change Order, for an increase in the Contract Sum not to exceed the amount of \$250,000.00.
- B. The document will describe changes in the Work, and will designate method of determining any change in Contract Sum or Contract Time.
- C. Promptly execute the change in Work.
- 1.9 OVERHEAD AND PROFIT
- A. The maximum amount allowable for overhead and profit on changed work is described below for subcontractors and general contractors:
- When Subcontractors submit pricing, they are to clearly outline on separate line items all:
- Labor costs
 - Material Costs
 - Equipment Costs

- Insurance
- Bond Costs

Overhead and Profit of 12% may then be added as a separate line item to be calculated using the Subtotal from the above Actual Costs described.

General Contractors (GCs) are to take the total individual Subcontractor costs calculated above (inclusive of 12% Overhead and Profit) and then add on GC Bond and Insurance Costs: The GC may then add 12% Overhead and Profit calculated from the previous subtotal and come up with a new subtotal inclusive of the 12% markup. The GC may add 3.5% Gross Receipts tax to the previous subtotal with this final calculated amount to be sent to the Owner for approval.

The above calculations are illustrated in the following Exhibit for reference. All Change Orders must follow these calculations or UMMC will reject the Change Order and ask for resubmission.

Electrical Sub				
	UOM	Qty	Each	Total
Conduit	EA	30	\$ 2.50	\$ 75.00
Wire	LF	100	\$ 5.00	\$ 500.00
Fittings	EA	30	\$ 0.75	\$ 22.50
Labor	HRS	8	\$ 25.00	\$ 200.00
				\$ 797.50
Bond (0.5%)				\$ 3.99
Insurance (1%)				\$ 7.98
Subtotal				\$ 809.46
OH&P (12%)				\$ 97.14
Total Electrical Sub Cost				\$ 906.60
Mechanical Sub				
	UOM	Qty	Each	Total
Fire damper	EA	10	\$ 125.00	\$ 1,250.00
Labor	HRS	16	\$ 30.00	\$ 480.00
				\$ 1,730.00
Bond (0.75%)				\$ 12.98
Insurance (1%)				\$ 17.30
Subtotal				\$ 1,760.28
OH&P (12%)				\$ 211.23
Total Electrical Sub Cost				\$ 1,971.51
General Contractor				
	UOM	Qty	Each	Total
Metal studs	EA	100	\$ 1.50	\$ 150.00
Gyp 4x8	EA	100	\$ 5.00	\$ 500.00
Labor	HRS	8	\$ 25.00	\$ 200.00
				\$ 850.00
Electrical Sub				\$ 906.60
Mechanical Sub				\$ 1,971.51
SubTotal Cost of Work				\$ 3,728.11
Bond (0.5%)				\$ 18.64
Insurance (1%)				\$ 37.28
Subtotal				\$ 7,512.13
OH&P (12%)				\$ 901.46
				SubTotal \$ 8,413.59
				Gross Receipts Tax (3.5%) \$ 294.48
				TOTAL CHANGE ORDER \$ 8,708.07

1.10 EXECUTION OF CHANGE ORDERS

- A. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- B. Final execution of Change Orders requires approval by Owner and the Institutions of Higher Learning.

1.11 CORRELATION OF CONTRACTOR SUBMITTALS

- A. Promptly revise Schedule of Values required by Section 012000 and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- B. Promptly revise progress schedules as required by Section 013100 or Section 013110, whichever applies, to reflect any change in Contract Time, revise sub-schedules to adjust time for other items of Work affected by the change order, and resubmit for approval.
- C. Promptly enter changes in Project Record Documents.

END OF SECTION

SECTION 012100
CASH ALLOWANCES

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Costs Included in Allowances.
- B. Contractor Costs Included in Contract Sums.
- C. Architect Responsibilities.
- D. Contractor Responsibilities.
- E. Schedule of Allowances.

1.2 COSTS INCLUDED IN ALLOWANCES

- A. Cost of product to Contractor or subcontractors, less applicable trade discounts.
- B. Delivery to site.
- C. Labor required under allowance, only when labor is specified to be included.
- D. Applicable taxes.

1.3 CONTRACTOR COSTS INCLUDED IN CONTRACT SUM

- A. Products handling at site, including unloading, uncrating, inspection for damage and storage.
- B. Protection of products from elements and from damage.
- C. Labor for installation and finishing, except when installation is specified as part of allowance.
- D. Other expenses required to complete installation.
- E. Contractor overhead and profit.

1.4 ARCHITECT RESPONSIBILITIES

- A. Consult with Contractor in consideration of products, suppliers, and installers.
- B. Select products, obtain Owner's written decision, and transmit full information to Contractor.
- C. Obtain proposals when requested.

1.5 CONTRACTOR RESPONSIBILITIES

- A. Assist Architect in determining suppliers and installer
- B. Make recommendations for Architect consideration.
- C. On notification of selection execute purchase agreement with designated supplier and installer.

- D. Arrange for and process shop drawings, product data, and samples.
- E. Install, adjust, and finish products as may be required.

1.6 SCHEDULE OF ALLOWANCES

Professional list any allowances in this section

END OF SECTION

SECTION 012300

ALTERNATES

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Submission procedures.
- B. Documentation of changes to Contract Sum and Contract Time.

1.2 REQUIREMENTS

- A. Submit Alternates with full description of the proposed Alternate and the effect on adjacent or related components.
- B. Alternates quotes on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement. Alternates will be taken in numerical order as the budget allows.
- C. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.3 SELECTION AND AWARD OF ALTERNATIVES

- A. Indicate variation of Bid Price for Alternates described below and list in Bid Form Document or any supplement to it, which requests a "difference" in Bid Price by adding to or deducting from the base bid price.

1.4 SCHEDULE OF ALTERNATES

- A. Alternate No. 1: ACCESSORY MILLWORK AS INDICATED ON DRAWINGS
- B. Alternate No. 2: _____
- C. Alternate No. 3: _____

2 PART 2 – PRODUCTS
NOT USED.

3 PART 3 – EXECUTION
NOT USED.

END OF SECTION

SECTION 013000
PROJECT MEETINGS

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. General Requirements.
- B. Preconstruction Conference.
- C. Progress Meetings.
- D. Pre installation Conferences.

1.2 GENERAL REQUIREMENTS

- A. The Owner shall schedule and Contractor administer periodic progress meetings, pre installation meetings, and specially called meetings throughout the progress of the Work.
 - 1. Prepare agenda for meetings.
 - 2. Distribute written notice of each meeting seven (7) days in advance of meeting date.
 - 3. Make physical arrangements for and preside at meetings.
 - 4. Record the minutes - include all significant proceedings and decisions.
 - 5. Reproduce and distribute copies of minutes within two (2) days after meeting.
 - a. To all participants in the meeting.
 - b. To all parties affected by decisions made at the meeting.
- B. Representatives of Contractors, subcontractors, and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. Architect will attend meetings to ascertain if Work is being expedited consistent with Contract Documents and the construction schedule.

1.3 PRECONSTRUCTION CONFERENCE

- A. The Owner will schedule a conference as soon as possible after Notice of Award and after Contractor furnishes the proposed preliminary schedule in the format and within the time required by Section 013100, Part 1.5.A or Section 013110, Part 1.2.A, whichever applies, unless Owner, in its sole discretion, desires to schedule and conduct the preconstruction conference before receipt of such schedule.
- B. Attendance Required: Owner, Architect and Contractor, Contractor's project manager, superintendent and project coordinator, major subcontractors, major suppliers and others as appropriate.
- C. Agenda:
 - 1. Review of Contractor's bonds and insurance certificates submitted with executed Contract.
 - 2. Establish date for Notice to Proceed.
 - 3. Distribution of Contract Documents.
 - 4. Review list of all subcontractors and suppliers.
 - 5. Review Contractor's proposed Schedule of Values.

6. Designation of personnel authorized to represent the Owner, Contractor, and the Architect.
7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract closeout procedures.
8. Scheduling and review of Contractor's schedule as required by Section 013100 or Section 013110, whichever applies.
9. Use of premises by Owner and Contractor.
10. Owner's requirements.
11. Temporary utilities.
12. Survey and building layout.
13. Security and housekeeping procedures.
14. Procedures for testing.
15. Review procedures for maintaining record documents.
16. Review EHS requirements and Interim Life Safety Risk Assessment.
17. Infection Control procedures.

1.4 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within two (2) days to Architect/Engineer, Owner, participants, and those affected by decisions made. Applications for payment will not be approved until acceptable minutes are received from Contractor.
- C. Attendance Required: Contractor's Project Manager, superintendent, and coordinator, major subcontractors and suppliers, mechanical and electrical subcontractors' project coordinators, Owner, Architect/Engineer, as appropriate to agenda topics for each meeting.
- D. Agenda:
 1. Review minutes of previous meetings.
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems which impede planned progress.
 5. Review of submittal schedule and status of submittals along with open RFI's.
 6. Review of off-site fabrication and delivery schedules.
 7. Maintenance of progress schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Safety update.
 11. Maintenance of quality and work standards.
 12. Effect of proposed changes on progress schedule and coordination.
 13. Other business relating to Work.
 14. Review draft copy of Application for Payment submitted at least five (5) business days before meeting per Section 012010, Part 1.4.A.

1.5 PREINSTALLATION CONFERENCES

- A. When required in individual specification Section, convene a pre installation conference at work site prior to commencing work of the Section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific Section.
- C. Notify Project Team four (4) days in advance of meeting date.

- D. Prepare agenda, preside at conference, record minutes, and distribute copies within two (2) days after conference to all participants, with two (2) copies to Architect.
- E. Review conditions of installation, preparation and installation procedures, and coordination with related work.

2 PART 2 - PRODUCTS
NOT USED.

3 PART 3 - EXECUTION
NOT USED.

END OF SECTION

SECTION 013100

PROGRESS SCHEDULES

(For Use Where Original Contract Sum is \$1 Million or Less)

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Format.
- B. Content.
- C. Revisions to schedules.
- D. Submittals.

1.2 FORMAT

- A. Prepare Schedules as a horizontal bar chart with separate bar for each major portion of Work or operations, identifying first work day of each week.
- B. Sequence of Listings: The Table of Contents of this Project Manual. The chronological order of the start of each item of Work. Show progress by level as described in Section 012000 - Schedule of Values.
- C. Scale and Spacing: To provide space for notations and revisions.
- D. Sheet Size: Minimum 8.5 x 14 inches.

1.3 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction. Milestone activities are also to be identified on the schedule. The Schedule shall also include 10% total float built into the schedule.
- B. Show utility disconnection and/or relocation in Preliminary Schedule and Progress Schedules as required by Section 002113, Parts 1.8.B and C; Section 007300, Article 3.2.5; Section 011000, Part 1.5; and Section 011050, Part 1.2.C.
- C. Identify each item by specification Section number.
- D. Identify work of separate floors and other logically grouped activities.
- E. Provide sub-schedules to define critical portions of the entire Schedule, including, if applicable, utility disconnection and/or relocation.
- F. Provide sub-schedules for Owner's use indicating all interface required with Owner's personnel concerning items such as temporary and permanent utility connections and/or interruptions.
- G. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the end of each pay period.
- H. Provide separate schedule of submittal dates for shop drawings, product data, and samples, including Owner furnished products and Products identified under Allowances, and dates

reviewed submittals will be required from Architect. Indicate decision date for selection of finishes. Allow sufficient time for Owner and Architect review.

- I. Indicate delivery dates for Owner furnished products, and Products identified under Allowances.
- J. Coordinate content with Schedule of Values specified in Section 012000.

1.4 REVISIONS TO SCHEDULES

- A. Indicate progress of each activity to date of submittal, and project completion date of each activity.
- B. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
- C. Provide narrative report to define problem areas, anticipated delays, and impact on Schedule. Report corrective action taken, or proposed, and its effect. The contractor shall also develop a Recovery schedule as requested by the Owner for review.

1.5 SUBMITTALS

- A. Submit preliminary schedule to Project Team five (5) business days before preconstruction conference.
- B. Owner may, at its option, withhold issuance of the Notice to Proceed pending Contractor's submission of an acceptable preliminary schedule.
- C. Prepare preliminary schedule of first 60 days, outlining the Contractor's detailed plan of action for the first 60 days and its general approach to the remaining Work, accompanied by a written narrative description of the work plan. The Owner shall respond within 14 calendar days, either accepting the preliminary schedule or rejecting it. If rejected, Contractor shall resubmit within five (5) business days. The preliminary schedule may be either a critical path or horizontal bar chart and shall be updated monthly during the 60-day period.
- D. Submit detailed Schedule of all Work within 30 days after preconstruction conference for review by Architect and Owner. Resubmit modified schedule to reflect revisions required by Owner or Architect within five (5) business days.
- E. Submit updated and revised Progress Schedules with narrative report with each Application for Payment.
- F. Approval of Application for Payment shall be contingent on receipt of updated and revised Progress Schedule.

1.6 DISTRIBUTION

- A. Distribute copies of approved Schedules electronically to Project Team and electronic database (where applicable), Subcontractors, suppliers, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in Schedules.

2 PART 2 - PRODUCTS NOT USED.

3 PART 3 – EXECUTION
NOT USED.

END OF SECTION

SECTION 013110

NETWORK ANALYSIS SCHEDULE (For Use Where Original Contract Sum is More Than \$1 Million)

PART 1 - GENERAL

1.1 - SECTION INCLUDES

- A. Description.
- B. References.
- C. Quality Assurance.
- D. Format.
- E. Schedules.
- F. Submittals.

1.2 - DESCRIPTION

- A. Submit the preliminary schedule for the first 90 days within 10 work days before the preconstruction conference. Owner may, at its option, withhold issuance of the Notice to Proceed pending Contractor's submission of an acceptable preliminary schedule.
- B. Prepare the preliminary schedule for the first 90 days, outlining the Contractor's detailed plan of action for the first 90 days and its general approach to the remaining Work, accompanied by a written narrative description of the work plan.
- C. The Owner shall respond to the preliminary schedule within 10 calendar days, either accepting or rejecting the preliminary schedule. If rejected, Contractor shall resubmit within 5 calendar days. The preliminary schedule shall be updated monthly during the 90-day period.
- D. Submit the projected network analysis schedule for the entire Work within 30 days of the preconstruction conference and update at least monthly. Approval of Applications for Payment shall be contingent on receipt of updated and revised Progress Schedule.
- E. See Section 013110, Part 1.7 for additional requirements.

1.3 - REFERENCES

- A. The latest edition of the manual entitled The Use of CPM in Construction, A Manual for General Contractors and the Construction Industry, published by The Associated General Contractors of America (AGC) - Washington, D.C., shall be used.

1.4 - QUALITY ASSURANCE

- A. Contractor's Administrative Personnel. Two (2) years minimum experience in preparing, using, updating and monitoring CPM schedules on comparable projects is required.

1.5 - FORMAT

- A. Listings: Reading from left to right, in ascending order for each activity, identify each activity by the applicable specification section number.

- B. Diagram Sheet Size: Height and width as required. Ledger (11"x17") size minimum.
- C. Scale and Spacing: To allow for notations and revisions.

1.6 - SCHEDULES

- A. Critical Path Method: Prepare network analysis diagrams and supporting mathematical analyses using the *Critical Path Method* under *Concepts and Methods* as outlined in the AGC's The Use of CPM in Construction, A Manual for General Contractors and the Construction Industry.
- B. Order of Work: Illustrate order and interdependence of activities and sequence of Work; identify the critical path and indicate how start of a given activity depends on completion of preceding activities; and how completion of the activity may restrain start of subsequent activities. The Schedule shall also include 10% total float built into the sequence of activities. Include utility disconnection and/or relocation in Preliminary Schedule and Progress Schedules as required by Sections 002113, Parts 1.8.B and C; 007300, Article 3.2.5; 011000, Part 1.5; and 01041, Part 1.2.C.
- C. Complete Sequence of Construction: Illustrate complete sequence of construction by activity, identifying work of separate stages. Provide dates for submittals and return of submittals; dates for procurement and delivery of products; and dates for installation and provision for testing. Provide legend for symbols and abbreviations used. Work items shall be resource loaded to show the direct craft man-hours estimated to perform the activity including work by subcontractors.
- D. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
 - 1. Preceding and following event numbers;
 - 2. Activity description;
 - 3. Estimated duration of activity, in maximum thirty (30) day intervals;
 - 4. Man-hours for each activity;
 - 5. Earliest start date;
 - 6. Earliest finish date;
 - 7. Actual start date;
 - 8. Actual finish date;
 - 9. Latest start date;
 - 10. Latest finish date;
 - 11. Total and free float;
 - 12. Monetary value of activity (keyed to *Schedule of Values*);
 - 13. Percentage of activity completed;
 - 14. Responsibility.
- E. Analysis Program: Capable of identifying the critical path, compiling monetary value of completed and partially completed activities, accepting revised completion dates, and re computation of all dates and floats.
- F. Required Sorts: List of activities in sorts or groups:
 - 1. By preceding work item or event number from lowest to highest;
 - 2. By amount of float, then in order of early start;
 - 3. By responsibility in order of earliest possible start date;
 - 4. In order of latest allowable start dates;
 - 5. In order of latest allowable finish dates;

6. Contractor's Application for Payment sorted by *Schedule of Values* listings, Specifications section;
7. Listing of basic input data which generates the report;
8. Listing of activities on the critical path;
9. Monthly cash flow.

G. Schedule of Values: Coordinate contents with *Schedule of Values* in Section 012000.

1.7 - SUBMITTALS FOR REVIEW

- A. Review: Participate in review of projected network analysis schedule and diagrams jointly with the Architect and Owner to be held within 10 days after receipt of Contractor's schedule.
- B. Proposed Complete Network Diagram: Within thirty (30) days after joint review of proposed preliminary network diagram, submit draft of proposed complete network diagram for review. At Owner's request, Contractor to provide a narrative that explains the basis for Contractor's determination of construction logic, estimated durations and man-hours.
- C. Complete Network Diagram: Within ten (10) days after joint review of proposed complete network diagram, submit complete network analysis consisting of network diagrams, mathematical analysis and narrative.
- D. Updated Network Schedules: Submit updated network schedules monthly with each Application for Payment. Applications for Payment will not be paid until Contractor submits the updated network schedule and narrative.
- E. Narrative Reports: Each schedule shall be accompanied by a narrative report, summarizing problem areas and anticipated delays and the impact on the Schedule. Report corrective action taken, or proposed, and its effect. The contractor shall also develop a Recovery schedule as requested by the Owner for review.
- F. Copies: Distribute copies of approved Schedules electronically to Project Team and electronic database (where applicable), Subcontractors, suppliers, and other concerned parties. Contractor to provide hard copy of schedule at all OAC Meetings.

1.8 - REVIEW AND EVALUATION.

- A. Review: Participate in joint review and evaluation of network diagrams and analysis with the Architect at each submittal.
- B. Evaluate: Evaluate Project status to determine Work behind schedule and Work ahead of schedule.
- C. Revisions: After review and approval of the Architect, revise as necessary as a result of the review and resubmit within ten (10) days.

1.9 - UPDATING SCHEDULES

- A. Schedules: Maintain schedules to record actual start and finish dates of completed activities.
- B. Progress: Indicate progress of each activity to date of revision, with projected completion date of each activity. Update diagrams monthly to graphically depict current status of Work.
- C. Modifications: Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

- D. Changes: Indicates changes required to maintain Date of Substantial or Total Completion on the latest revised network diagram, accompanied by a narrative description and justification of the change. These changes will be made only with the approval of the Architect.
- E. Extensions: Contract completion time will be adjusted only for causes specified in the Contract. Requests for an extension of the Contract completion date by the Contractor shall be supported with a written narrative of justification, CPM data and supporting evidence as Owner may deem necessary for determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the Contract. Submission of proof based on revised activity logic duration and costs is required. The schedules must clearly display that the determination as to the total number of days of Contract extension shall be based upon the current computer-produced, calendar-dated schedule for the time period in question and all other relevant information. Actual delays in activities which, according to the computer-produced, calendar-dated schedule, do not affect the extended and predicted Contract completion dates shown by the critical path in the network, will not be the basis for a change to the Contract completion date. The Owner will, within a reasonable time after receipt of such justification and supporting evidence, review the facts and advise the Contractor in writing of the Owner's decision. The Contractor shall submit each request for a change in the Contract completion date to the Owner & Architect. The Contractor shall include as a part of each change order proposal, a sketch showing all CPM revisions, duration changes, and cost changes, for the work in question and its relationship to other activities on the approved arrow diagram.
- F. If there is a disagreement between Owner and Contractor regarding Contractor's entitlement to a Contract time extension, at Owner's election, a scheduling expert may be retained by the Owner to review and render an opinion regarding the time extension, if any, to which Contractor is entitled. The fees and expenses of the scheduling expert shall be shared equally by the parties.
- G. Substantiate: Submit sorts required to support recommended changes.
- H. Report: provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect.

1.10 - DISTRIBUTION

- A. Distribution of Copies: Following joint review, distribute copies of updated schedules to Contractor's Project site, to subcontractors, suppliers, Architect and Owner.
- B. Reporting Problems: Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

END OF SECTION

SECTION 013400

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

1 PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Submit shop drawings, product data, and samples required by the Contract Documents.
- B. Designate in the Progress Schedule and in a separate coordinated Schedule of Submittals submitted with the Progress Schedule as required by Section 007300, Article 3.10.2, the dates for submission and the dates that reviewed shop drawings, product data, and samples will be needed, such need dates to be not less than 15 work days from submission of an approved submittal.

1.2 SHOP DRAWINGS

- A. Drawings shall be presented in a clear and thorough manner.
 - 1. Details shall be identified by reference to sheet and detail, schedule or room numbers shown on Contract drawings.
- B. Minimum sheet size - 8-1/2" x 11".

1.3 PRODUCT DATA

- A. Preparation:
 - 1. Clearly mark each copy to identify pertinent products or models.
 - 2. Show performance characteristics and capacities.
 - 3. Show dimensions and clearances as required.
 - 4. Show wiring or piping diagrams and controls.
- B. Manufacturer's standard schematic drawings and diagrams:
 - 1. Modify drawings and diagrams to delete information which is not applicable to the work.
 - 2. Supplement standard information to provide information specifically applicable to the work.

1.4 SAMPLES

- A. Office samples shall be of sufficient size and quantity to clearly illustrate:
 - 1. Functional characteristics of the product, with integrally related parts and attachment devices.
 - 2. Full range of color, texture, and pattern.
- B. Field Samples and Mock-Ups:
 - 1. Contractor shall erect at the Project at a location acceptable to the Architect and Owner.
 - 2. Size of Area: That specified in the respective specification section.
 - 3. Fabricate each sample and mock-up complete and finished.
 - 4. Remove mock-ups at conclusion of work or when accepted by the Architect.

1.5 CONTRACTOR RESPONSIBILITIES

- A. Review shop drawings, product data, and samples prior to submission.
- B. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Catalog numbers and similar data.
 - 4. Conformance with specifications.
- C. Coordinate each submittal with requirement of the Work and the Contract Documents.
- D. Notify the Architect in writing at time of submission, of any deviations in the submittal from requirements of the Contract Documents.
- E. Begin no fabrication or work which requires submittals until return of submittals with Architect and Owner approval.
- F. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect's review of submittal.
- G. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Architect's review of submittals unless such deviation is specifically noted by Contractor in writing at the time of submittal and approved by Architect.

1.6 SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with approved schedule and in such sequence as to cause no delay in the work or in the Work of any other Contractor.
- B. Number of submittals required:
 - 1. Shop Drawings and Product Data: Documents are to be submitted electronically and by hard copy if requested by Owner and architect.
- C. Submittals shall contain:
 - 1. The date of submission and the dates of any previous submissions.
 - 2. The project title and number.
 - 3. Contract identification.
 - 4. The names of:
 - a. Contractor.
 - b. Supplier.
 - c. Manufacturer.
 - 5. Identification of each product with the specification section number prominently displayed on the first page of the submittal.
 - 6. Field dimensions clearly identified as such.
 - 7. Relation to adjacent or critical features of the work or materials.
 - 8. Applicable standards such as ASTM or Federal Specification numbers.
 - 9. Identification of deviations from Contract Documents.
 - 10. Identification of revisions on resubmittals.
 - 11. A 5 inch x 5 inch blank space for Contractor and Architect/Engineer stamps.
 - 12. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, and coordination of the information within the submittal with requirements of the work and of Contract Documents.

1.7 RESUBMISSION REQUIREMENTS

- A. Make any corrections or changes in the submittals required by the Architect and Owner and resubmit until approved.
- B. Shop Drawings and Product Data:
 - 1. Revise initial drawings or data and resubmit as specified for the initial submittal.
 - 2. Indicate any changes which have been made other than those requested by the Architect.
- C. Samples: Submit new samples as required for initial submittal.

1.8 DISTRIBUTION

- A. Distribute reproductions of shop drawings and copies of product data which carry the Architect's stamp of approval to:
 - 1. Job site file.
 - 2. Record documents file. One set required for Operation and Maintenance manuals and electronic copy, see Section 017800.
 - 3. Other affected Contractors.
 - 4. Subcontractors.
 - 5. Supplier or fabricator.
- B. Distribute samples which carry the Architect/Engineer stamp of approval as directed by the Architect/Engineer.

1.9 ARCHITECT/ENGINEER DUTIES

- A. Review submittal with reasonable promptness and in accord with schedule. Owner may review and approve submittals prior to approval and release by Architect. UMMC Facilities Services shall review for approval all MEP submittals that deviate from the Project Specifications.
- B. Affix stamp and initials or signature, and indicate requirements for resubmittal or approval of submittal.
- C. Return submittals to Contractor for distribution or for resubmission.

END OF SECTION

SECTION 014000

CONTRACT QUALITY CONTROL

1 PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Quality control of products and workmanship.
- B. Manufacturers' instructions.
- C. Manufacturers' certificates and field services.
- D. Mock-ups.

1.2 DESCRIPTION

- A. Maintain quality control over supervision, subcontractors, suppliers, manufacturers, products, services, workmanship, and site conditions, to produce work in accordance with Contract Documents.

1.3 WORKMANSHIP

- A. Comply with industry standard of the region except when more restrictive tolerances of specified requirements indicate more rigid standards or more precise workmanship.
- B. Provide suitably qualified personnel to produce work of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.
- D. Provide finishes to match approved samples.
- E. Assure that any damage to Owner's existing facilities and utilities is corrected and repaired immediately to the Owner's satisfaction.

1.4 MANUFACTURER'S INSTRUCTIONS

- A. Require compliance with instructions in full detail, including each step in sequence.
- B. Should instruction conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

1.5 MANUFACTURER'S CERTIFICATES

- A. When required in individual specifications sections, submit manufacturer's certificate, in duplicate, certifying that products meet or exceed specified requirements, executed by responsible officer.

1.6 MANUFACTURER'S FIELD SERVICES

- A. When required in individual specification section, have manufacturer or supplier provide qualified representative to observe field conditions, conditions of surfaces and installation, quality of

workmanship, start-up of equipment, and test, adjust, and balance of equipment as applicable and to make written report of observations and recommendations to Architect/Engineer.

1.7 MOCK-UPS

- A. Assemble and erect complete with specified attachment and anchorage devices, flashings, seals, and finishes.
- B. Acceptable mock-ups in place shall remain in place until completion of project.
- C. Remove mock-up at completion of project or as may be instructed by Architect.

END OF SECTION

SECTION 014100

TESTING LABORATORY SERVICES

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Selection and payment.
- B. Contractor submittals.
- C. Laboratory responsibilities.
- D. Laboratory reports.
- E. Limits on testing laboratory authority.
- F. Contractor responsibilities.
- G. Schedule of inspections and tests.

1.2 REFERENCES

- A. ASTM D3740-19 – Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ASTM E329-18 – Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
- C. ASTM C1077-17 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
- D. ASTM D3666-16 - Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

1.3 SELECTION AND PAYMENT

- A. Contractor shall employ and pay for services of an independent testing laboratory to perform specified inspection and testing.
- B. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with the requirements of the Contract Documents.

1.4 QUALITY ASSURANCE

- A. Comply with requirements of ASTM E329-18 Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection, and ASTM D3740-19 Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. Laboratory: Authorized to operate in Mississippi.
- C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

- D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to the National Institute of Standards and Technology (NIST) Standards or accepted values of natural physical constraints recognized by UMMC.

1.5 CONTRACTOR SUBMITTALS

- A. Prior to start of Work, submit testing laboratory name, address, and telephone number, and names of full time registered Engineer and responsible officer.
- B. Provide evidence of Lab Certifications.

1.6 LABORATORY RESPONSIBILITIES

- A. Test samples of mixes submitted by Contractor.
- B. Provide qualified personnel at site to gather and test materials. Cooperate with Architect and Contractor in performance of services.
- C. Perform specified inspection, sampling, and testing of Products in accordance with specified standards.
- D. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or Products.
- F. Perform additional inspections and tests required by Architect.
- G. Attend preconstruction conferences and progress meetings.

1.7 LABORATORY REPORTS

- A. After each inspection and/or test, promptly submit electronic test report and/or daily report to Architect, and to Contractor.
- B. Include:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name of inspector.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and Specifications Section.
 - 6. Location in the Project.
 - 7. Type of inspection or test.
 - 8. Date of test.
 - 9. Results of tests.
 - 10. Conformance with Contract Documents.
- C. When requested by Architect, provide interpretation of test results.

1.8 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.

- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the Work.

1.9 CONTRACTOR RESPONSIBILITIES

- A. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities.
- B. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- C. Notify Architect/Engineer and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.
- D. Perform no work which requires laboratory inspection services unless laboratory representative is on site observing work.

1.10 SCHEDULE OF INSPECTIONS AND TESTS

- A. Refer to the following Sections:

310513	Soils for Earthwork
312000	Earth Moving
312323.13	Backfill
312333	Trenching and Backfilling
315000	Excavation Support and Protection
321216	Asphalt Paving
321313	Concrete Paving
321613	Curbs and Gutters
331416	Site Water Utility Distribution Piping
334600	Sub-drainage
334100	Storm Utility Drainage Piping
333113	Site Sanitary Sewerage Piping
033000	Cast-in-Place Concrete
051200	Structural Steel Framing

2 PART 2 – PRODUCTS
NOT USED.

3 PART 3 – EXECUTION
NOT USED.

END OF SECTION

Note to Professional: Section numbers referenced in paragraph 1.10 must be modified for specific project requirements.

SECTION 014219

REFERENCE STANDARDS

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Quality assurance.
- B. Schedule of references.

1.2 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Obtain copies of standards when required by Contract Documents.
- C. Maintain copy at job site during submittals, planning, and progress of the specific work, until Substantial Completion.
- D. Should a specified reference standard conflict with the Contract Documents, request clarification from the Architect before proceeding with the associated work.
- E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.3 REFERENCES

- A. Refer to each Section for references used within that Section.

2 PART 2 - PRODUCTS
NOT USED.

3 PART 3 - EXECUTION
NOT USED.

END OF SECTION

SECTION 015000

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone service, wireless internet, water, and sanitary facilities.
- B. Temporary Controls: Barriers, infection control barriers, enclosures and fencing, protection of the Work, and water control.
- C. Construction Facilities: Material storage areas, progress cleaning, access roads, parking.

1.2 TEMPORARY ELECTRICITY

- A. Provide and pay for power service required from Owner's existing source.
- B. Provide temporary electric feeder from electrical service at location as directed. Power consumption shall not disrupt Owner's need for continuous service.
- C. Provide power outlets for construction operations, with branch wiring and distribution boxes located at each floor. Provide flexible power cords as required.
- D. Provide meter when required by Electrical Documents.

1.3 TEMPORARY LIGHTING

- A. Provide and maintain lighting for construction operations to achieve at or above the minimum lighting levels required by Occupational Safety and Health Administration (OSHA).
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtail, and lamps as required.
- C. Maintain lighting and provide routine repairs.
- D. Maintain lighting to insure life safety and fire protection requirements.

1.4 TEMPORARY HEAT

- A. Existing facilities shall not be used.
- B. Provide and pay for heat devices and heat as required to maintain specified conditions for construction operations.
- C. Maintain minimum ambient temperature of 60 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

1.5 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Ventilate enclosed areas as required for infection control.

1.6 TELEPHONE SERVICE

- A. Provide, maintain and pay for telephone (including wireless internet) service to field office and Architect field office at time of project mobilization.
- B. Provide Owner and Architect the names, emergency telephone numbers and e-mail addresses of Contractor's Project management team, including its on-site representative.

1.7 TEMPORARY WATER SERVICE

- A. Provide, maintain and pay for suitable quality water service required. Connect to existing water source for construction operations.
- B. Provide separate metering and reimburse Owner for cost of water used when required by Mechanical Documents.
- C. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

1.8 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Existing facilities shall not be used, without written authorization from Owner.

1.9 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plant life designated to remain. Replace damaged plant life.
- D. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

1.10 FENCING

- A. Construction (Type/Method): 8' high chain-link fencing with blue wind screen is required, without any logos or branding. Fencing and wind screen must be maintained in good condition throughout the project duration, kept vertical with respect to the ground, and the location, extents and design shall be approved by the UMMC project manager prior to installation
- B. Where applicable, required for safety reasons, or indicated on drawings, provide fence around construction site; equip with vehicular and pedestrian gates and locks. Owner & Contractor locks to be interlocked together.

1.11 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

- C. Provide erosion control barriers as per MDEQ requirements.
- 1.12 EXTERIOR ENCLOSURES
- A. Provide temporary weather-tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
- 1.13 INTERIOR ENCLOSURES
- A. Provide temporary partitions as required to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment. Comply with infection control requirements as indicated.
 - B. Construction: All materials shall be non-combustible.
 - 1. Enclosure: Gypsum board with closed edges and joints when intersecting with existing materials.
 - 2. Dust Barrier:
 - (a) Studs: Metal
 - (b) Barrier: 6 MIL fire retardant polyethylene
 - (1) 6 MIL fire retardant polyethylene shall meet or exceed ASTM E84-2010 test requirements and pass NFPA 701-2010 test 1 for anti-static fire retardant polyethylene.
 - (2) Fire retardant polyethylene shall be clearly imprinted with the product compliance to NFPA 701-2010 test 1 so that the material is visibly identified as fire retardant.
 - (3) Product information shall be maintained on-site, clearly visible for verification of compliance.
 - 3. Closure material (tape or connections) shall be fire retardant compatible with 6 MIL fire retardant polyethylene.
- 1.14 PROTECTION OF INSTALLED WORK
- A. Protect installed Work and provide special protection where specified in individual specification sections.
 - B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize danger.
 - C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
 - D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
 - E. 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.
 - F. Prohibit traffic from landscaped areas.
- 1.15 SECURITY

- A. Provide security and facilities to protect Work, and existing facilities and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner's security program.
- C. Provide identification badges for each employee of the Contractor and Subcontractor working on the project site. See additional badging requirements for Superintendents referenced in Section 002113 subsection 1.8. Employees must wear the badges in a visible location at all times they are on campus performing work on the Project. At a minimum, information on badges is to include the UMMC Project number and Project name, and the Contractor's name and contact telephone number. Additional information may be included at the Contractor's option. A sample badge is to be submitted to the Owner for approval prior to beginning any on-site work.

1.16 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove all visible dust, 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. Remove waste materials, debris, and rubbish from site periodically and dispose off-site. Any material moved through the hospital must be enclosed within covered containers.
- E. Clean Owner occupied areas and remove debris daily.
- F. Weed eat around site and at perimeter fencing to maintain the existing maintained appearance of lawns and landscaping.

1.17 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary above grade or buried utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1.18 UNCOVERING OF ALL UNDERGROUND UTILITIES

- A. The University will locate all University of Mississippi Medical Center owned underground utilities. Once located by the University, the Contractor will be responsible for transferring the exact location of all underground lines to their field set of construction documents for future reference. Horizontal dimensions to be tied down to a permanent object. Contractor to call "811 It's the Law" and provide confirmation number to Owner afterwards.
- B. The Contractor will need to uncover the existing utilities using hand digging. No backhoes are to be used to uncover any utilities. Once uncovered, the Contractor will transfer the vertical depth of all utilities to his field set of construction documents for future reference.

PART 2 – PRODUCTS NOT USED.

PART 3 – EXECUTION
NOT USED.

END OF SECTION

SECTION 015213
FIELD OFFICES AND SHEDS

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary Field Offices and Sheds.
- B. Maintenance and Cleaning.
- C. Removal.

1.2 USE OF EXISTING FACILITIES

- A. Existing facilities shall not be used for field offices or for storage, unless approved in writing by Owner.

2 PART 2 - PRODUCTS

2.1 MATERIALS, EQUIPMENT, FURNISHINGS

- A. Materials, Equipment, Furnishings: Serviceable, new or used, adequate for required purpose.

3 PART 3 - EXECUTION

3.1 PREPARATION

- A. Fill and grade sites for temporary structures to provide drainage away from buildings.

3.2 INSTALLATION

- A. Install office spaces ready for occupancy 15 days after date fixed in the Notice to Proceed.
- B. Parking: When applicable provide one parking space for use by the Architect and one parking space for the Owner, as close as possible to office.

3.3 CONSTRUCTION

- A. Portable or mobile buildings, or buildings constructed with floors raised above ground, securely fixed to foundations, with steps and landings at entrance doors.
- B. Construction: Structurally sound, secure, weather tight enclosures for office and storage spaces. Maintain during progress of Work; remove at completion of Work.
- C. Temperature Transmission Resistance of Floors, Walls, and Ceilings: Compatible with occupancy and storage requirements.
- D. Exterior Materials: Weather resistant, finished in one color acceptable to Architect.
- E. Interior Materials in Offices: Sheet type materials for walls and ceilings, pre-finished or painted; resilient floors and bases.
- F. Lighting for Offices: 50 foot-candles (fc) at desk-top height, exterior lighting at entrance doors.

- G. Fire Extinguishers: Appropriate type fire extinguisher at each office and each storage area.
 - H. Interior Materials in Storage Sheds: As required to provide specified conditions for storage of products.
- 3.4 ENVIRONMENTAL CONTROL
- A. Heating, Cooling, and Ventilating for Offices: Automatic equipment to maintain comfort conditions. 68 degrees F heating and 76 degrees F cooling.
 - B. Storage Spaces: Heating and Ventilation as needed to maintain products in accordance with Contract Documents; adequate lighting for maintenance and inspection of products.
- 3.5 CONTRACTOR OFFICE AND FACILITIES
- A. Size: For Contractor's needs and to provide adequate space for project meetings.
 - B. Telephone and Internet: Provide as required by local utility.
 - C. Furnishings in Meeting Area: Conference table and chairs to seat at least twelve (12) persons; racks and files for Contract Documents, submittals, and Project Record Documents.
 - D. Other Furnishings: Contractor's option.
 - E. Equipment: Six adjustable band protective helmets for visitors along with safety glasses and vests, one 10 inch outdoor weather thermometer and one rain gauge.
- 3.6 STORAGE AREAS AND SHEDS
- A. Size to storage requirements for products of individual Sections. Allow for access and orderly provision for maintenance and for inspection of products under provisions of Section 016000.
- 3.7 MAINTENANCE AND CLEANING
- A. Weekly janitorial services for offices; periodic cleaning and maintenance for office and storage areas.
 - B. Maintain approach walks free of mud, water, and snow.
- 3.8 REMOVAL
- A. At completion of Work remove buildings, foundations, utility services, and debris. Restore all disturbed areas to pristine condition.

END OF SECTION

SECTION 015500
TRAFFIC REGULATION

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Construction Parking Control.
- B. Flagmen.
- C. Flares and Lights.
- D. Haul Routes.
- E. Traffic Signs and Signals.
- F. Removal.

1.2 SIGNS, SIGNALS, AND DEVICES

- A. Post Mounted and Wall Mounted Traffic Control and Information Signs: Specified in Section 015800.
- B. Flagman Equipment: As approved by local jurisdictions.

1.3 CONSTRUCTION PARKING CONTROL

- A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.
- B. Monitor parking of construction personnel's vehicles in existing facilities. Maintain vehicular access to and through parking areas.
- C. Prevent parking on or adjacent to access roads or in non-designated areas.
- D. Contractor's employees may park personal vehicles at the UMMC Farmer's Market. It is the responsibility of the contractor to transport employees to and from the project site.

1.4 FLAGMEN

- A. Provide trained and equipped flagmen (minimum of 2) to regulate traffic when construction operations or traffic encroach on public traffic lanes.

1.5 FLARES AND LIGHTS

- A. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

1.6 HAUL ROUTES

- A. Confine construction traffic to designated haul routes.

- B. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic. Avoid times from 7:00-8:30 and 3:30-5:00. Any deliveries that arrive during these times must be staged offsite until traffic subsides.

1.7 TRAFFIC SIGNS AND SIGNALS

- A. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

1.8 REMOVAL

- A. Remove equipment and devices when no longer required.
- B. Repair damage caused by installation.

END OF SECTION

SECTION 015800

PROJECT IDENTIFICATION AND SIGNS

1 PART 1 - GENERAL

1.1 DESCRIPTION

- A. Furnish, install, and maintain project identification sign.
- B. Conform construction to codes, laws, and regulatory agencies.
- C. Remove signs on completion of construction.
- D. Allow no other signs to be displayed unless approved by UMMC.

1.2 PROJECT IDENTIFICATION SIGN

- A. Furnish and install project identification signage as herein specified.
- B. Sign board shall be constructed as detailed by Architect & Owner at later date.
- C. Erect at location directed by Architect and approved by the Owner.
- D. Refer to Section 012100 - Cash Allowance.

1.3 QUALITY ASSURANCE

- A. Sign Painter: Professional Experience in the type of work required.
- B. Finishes - Painting: Adequate to resist weathering and fading for the scheduled construction period.

2 PART 2 - PRODUCTS

2.1 SIGN MATERIALS

- A. Structure and Framing: May be new or used material in sound condition structurally adequate to the work and suitable for specified finish.

3 PART 3 - EXECUTION

3.1 PROJECT IDENTIFICATION SIGN

- A. Paint all exposed surfaces of supports, framing, and surface material; one coat of primer and one coat of exterior paint.
- B. Protect the finished surface with at least three coats of clear, waterproof, matte acrylic finish sufficiently durable to last for the entire construction period.

3.2 INFORMATIONAL SIGNS

- A. Paint all exposed surfaces - one coat of primer and one coat of exterior paint.
- B. Provide graphics in the styles, sizes, and colors as selected.

C. Install at a height for optimum visibility and as directed by Architect.

3.3 MAINTENANCE

A. Maintain signs and supports in a neat, clean, and legible condition. Repair damages to structure, framing, or sign.

B. Relocate informational signs as required by progress of the work.

3.4 REMOVAL

A. Remove signs, framing, supports, and foundations at completion of project.

END OF SECTION

SECTION 016000

MATERIAL AND EQUIPMENT

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.
- E. Substitutions.

1.2 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- C. Provide interchangeable components of the same manufacturer, for similar components.

1.3 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 STORAGE AND PROTECTION

- A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures. Materials must also be insured at storage facility.
- B. For exterior storage of fabricated products, place on sloped supports, above ground.
- C. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- D. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- E. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

- F. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.
- G. Prohibit storage of products and materials on landscaped areas to remain or under driplines of trees to remain.

1.5 "OR EQUAL" SUBSTITUTIONS

- A. Materials, equipment and products incorporated in the Work must be approved for use before being purchased by the Contractor. Within thirty (30) calendar days after Contract Execution the Contractor shall submit to the Architect a list of proposed materials, equipment or products together with such samples or submittals. No request for payment for materials, equipment or products will be approved until this list has been received and approved by the Architect. Failure to request substitution within the thirty (30) day period shall be sufficient cause for rejection of the request in which case the Contractor shall be required to furnish the specified material, product or equipment at no additional cost to Owner.
- B. Unless the specific section of the specifications does not allow substitution, it shall be understood that whenever a material, article or piece of equipment is identified on the Plans or in the Specifications by reference to brand name or catalogue number, this is referenced for the purpose of defining the performance or other salient requirements, and that other products of equal capacities, quality and function shall be considered. The Contractor may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the Contract Documents by reference to brand name or catalogue number, and if, in the opinion of the Architect, such material, article, or piece of equipment is of equal substance and function to that specified, the Architect may approve its substitution and use by the Contractor. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time.
- C. No "or equal" substitute shall be ordered or installed without the written approval of the Architect who shall be the judge of equality.
- D. Delay caused by obtaining approvals for "or equal" substitute materials will not be considered justifiable grounds for an extension of Contract time.
- E. Should any work or materials, equipment or products not conform with requirements of the Plans and Specifications or become damaged during the progress of the Work, such Work or materials shall be removed and replaced at any time before completion and acceptance of the Project. All such work shall be done at the expense of Contractor.
- F. No materials or supplies for the Work shall be purchased by the Contractor or by any subcontractor subject to any chattel mortgage or under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work.
- G. In the application for an "or equal" substitution, the Contractor shall certify that the proposed "or equal" substitute will perform the functions and achieve the performance or other salient requirements of the specifications and be equal to that specified. The application shall also state whether or not (a) acceptance of the proposed "or equal" substitute will require a change in the Plans or Specifications to adapt the design to the proposed "or equal" substitute (b) incorporation or use of the proposed "or equal" substitute in the Work is subject to payment of any license fee or royalty; and (c) there are any variations between the proposed "or equal" substitute and that specified. The application shall also indicate available maintenance, repair and replacement service and shall contain a statement that Contractor agrees to pay all costs

that will result directly or indirectly from acceptance of such "or equal" substitute, including costs of redesign and claims of other Contractors affected by the resulting change. Architect may require Contractor to furnish at Contractor's expense additional data about the proposed "or equal" substitute. Architect will be allowed a reasonable time within which to review the Contractor's applications for the proposed "or equal" substitute. Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other guarantee with respect to any "or equal" substitute. In the event the proposed "or equal" substitute does not meet the requirement of the Plans and Specifications, Architect will list reasons for rejection and the Architect's decision shall be final. In the event of rejection by the Architect, Contractor shall, at its expense, immediately procure and furnish the specified material or equipment.

H. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

I. "Or equal" substitution Submittal Procedure:

1. Using the form contained at Section 016000-4, submit electronically "or Equal" Substitution Request for consideration containing all representations and certification required by this Section. Failure to make all representations and certifications required by this Section shall be sufficient cause for rejection of the request. Limit each request to one proposed substitution.
2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence.
3. The Architect and Owner will notify Contractor, in writing, of decision to accept or reject request.
4. If request for substitution is approved, make shop drawing submittal in accordance with Section 013400.

2 PART 2 - PRODUCTS
NOT USED.

3 PART 3 - EXECUTION
NOT USED.

END OF SECTION

"OR EQUAL" SUBSTITUTION

TO: _____
 PROJECT: _____
 SPECIFIED ITEM: _____

Section	Page	Paragraph	Description
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The undersigned requests consideration of the following:

PROPOSED "OR EQUAL" SUBSTITUTION

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

Attached data also includes a description of changes to the Contract Documents which the proposed substitution or "or equal" will require for its proper installation. Acceptance of the proposed "or equal" substitution will require the following changes:

The undersigned certifies that the following paragraphs, unless modified by attachments are correct:

1. The proposed "or equal" substitution does not affect dimensions shown on the drawings.
2. The undersigned will coordinate the installation of the proposed product and will make changes to other Work which may be required at no additional costs to the Owner.
3. The proposed "or equal" substitution will have no adverse effect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed "or equal" substitution.
5. The proposed product has been investigated and it has been determined that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.
6. The same warranty is available for the proposed product as for the specified product.
7. Any claim for additional costs and/or time in connection with the proposed "or equal" substitution are hereby waived.
8. The Owner will be reimbursed for review or redesign services associated with re-approval by authorities.
9. Incorporation or use of the proposed "or equal" substitution in the Work _____ is _____ is not subject to payment of any license fee or royalty.

The undersigned agrees to pay all costs that result directly or indirectly from acceptance of such "or equal" substitute, including costs of redesign and claims of other contractors affected by the resulting change.

Submitted by: (PRINT NAME, TITLE) _____

Signature: _____

Firm: _____

Address: _____

Date: _____

Telephone / E-mail: _____

Attachments: _____

For use by the design consultant:

_____ Accepted _____ Accepted as noted
 _____ Not Accepted _____ Received too late

By: _____

Date: _____

Remarks: _____

SECTION 017000
CONTRACT CLOSEOUT

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Adjusting.
- D. Project record documents.
- E. Warranties.
- F. Spare parts and maintenance materials.

1.2 CLOSEOUT PROCEDURES

- A. The following itemized lists are provided for preparing closeout documents required for Substantial Completion and Final Completion. The lists do not replace or supersede the detailed requirements set forth elsewhere in the specifications, but clarify what is typically required for Substantial Completion vs. Final Completion on UMMC projects. Each item should be submitted electronically (in PDF format) as well as in printed form to the architect, as described:

SUBSTANTIAL COMPLETION:

The Contractor shall furnish the following items to the Architect:

1. All close-out documents specified in the Contract Documents for Substantial Completion, including Specification Sections 017000 and 017800.
2. Documents required by the Mississippi State Department of Health (MSDH) for Final Construction Approval, detailed in Section 017000, and any others that may be required by MSDH, as applicable.
3. Testing and Balancing (T&B) Reports must be complete, accompanied by a review letter from the Mechanical Engineer of Record certifying that flows are acceptable (if numbers are low, explain) and start-up documentation provided. T&B scope should include domestic, heating and cooling water systems as well as air systems.
4. Documentation confirming that Sprinkler system testing has been performed and verification letter provided from Sprinkler Subcontractor.
5. Fire alarm test results with certification letter from the installer.
6. Guarantee of Work, signed by Contractor and Contractor's Surety, prior to Substantial Completion.
7. Manufacturers' certifications and/or warranties required by the Contract Documents, including Section 017100.
8. Written comprehensive list of items to be completed and/or corrected prior to final payment, and prior to the request for an Architect's and Owner's inspection of the work to determine if the project is substantially complete. Confer with Architect and Owner regarding format requirements prior to developing the list.
9. A final inspection and operating certificate must be obtained from the Mississippi Insurance Department, Elevator Safety Division, for any added or modified elevator, escalator or lift covered by the Mississippi Conveyance Safety Act.
10. All access control hardware should be installed and complete with functional testing. Operation should coordinate with the Fire Alarm System.

11. Key cylinders must be installed and keys delivered directly to the Owner. Provide copy of transmittal to the Architect for delivery confirmation.

The Architect shall review and convey the Contractor-supplied materials to the Owner, as well as provide the following additional items to the Owner, for the project to achieve Substantial Completion:

1. For Health Care Facility projects, Architect and Engineers of Record shall complete the UMMC Project Utility System Checklist.
2. The Architect and Owner review and amend the Contractor's list of items to be completed and/or corrected prior to signing the Certificate of Substantial Completion. This list will be referred to as the design professional's preliminary punch list.
3. Fire damper testing complete with a letter from the Mechanical Engineer of Record indicating proper function and reporting of fire damper operation.
4. The Fire Alarm system must be successfully inspected and tested by UMMC Fire and Safety personnel.
5. The State Fire Marshall shall provide an inspection in conjunction with UMMC Fire and Safety personnel to determine if the project is safe for occupancy. If deficiencies are noted, they must be completed prior to acceptance of the project as being substantially complete. The State Fire Marshall or the delegated Authority Having Jurisdiction (AHJ) must provide an acceptance letter prior to occupancy.
6. The Architect, Contractor and Owner will sign the Certificate of Substantial Completion, with the preliminary punch list attached thereto.

FINAL COMPLETION:

The Contractor shall furnish the following items to the Architect:

1. As-built drawings and marked up specifications.
2. Operations and Maintenance (O&M) digital and print materials indexed per specifications (two hard copies in 3-ring D binders, printed single-sided).
3. Owner Training required by the specifications shall be complete. Provide video documentation of these sessions to the Architect, with files indexed to the O&M materials.
4. Documentation of all window systems testing, with verification letter provided from Independent Testing Agency that testing was completed satisfactorily.
5. Written notice shall be provided certifying that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will provide a final inspection in coordination with the Owner.
6. The final Application for Payment, submitted separately from the remaining closeout documents, using a separate transmittal.
7. A certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, as applicable.
8. A written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents.
9. Consent of Surety to Final Payment on AIA Form G707-1994 Consent of Surety to Final Payment.
10. Release of liens on AIA Document G706A-1994 Contractor's Affidavit of Release of Liens
11. Certification that all bills have been paid on AIA Document G706-1994 Contractor's Affidavit of Payment.
12. Copies of all approved submittals, indexed to match specification section references. The submittals should be submitted electronically and in hard copy.
13. Verification letter from hardware manufacturer representative that cylinder installations are acceptable.
14. Mississippi Department of Environmental Quality (MDEQ) notice of commencement, weekly reports and notice of project completion.
15. Air monitoring reports, as applicable.

16. Hazardous materials documentation - survey, manifests, chain of custody, MDEQ notifications, etc., as applicable.
17. All material laboratory testing reports and special inspection reports performed, as applicable.

The Architect shall review and convey the contractor-supplied materials to the Owner, as well as provide the additional items to the Owner, for the project to achieve Final Completion:

1. The Architect and Owner review the Work once the Contractor provides written notice that all work is complete. The Architect provides a final punch list to the Owner as a precondition to final payment of the Contractor.
2. Architect reviews all the contractor-supplied closeout materials for accuracy and completeness before submitting to the Owner, and directs the Contractor to make modifications as required.
3. Architect reviews and submits the Contractor's Final Application for Payment to the Owner. This should follow the separate submission of all other closeout materials, under a separate transmittal.
4. Architect provides a certification letter that the project was completed in compliance with the contract documents and state and federal rules and regulations.

B. Provide the following documents to the Architect as required by governing or other authorities. When asked, provide assistance/workmen to assist in Mississippi State Department of Health (MSDH) Inspections. For the MSDH final construction acceptance inspection, provide the following documents. All documents require legible printed names and actual signatures (no scripted fonts may be used in lieu of an actual signature):

1. Certification from Contractor of Record (certifying building is constructed in accordance with applicable Building Codes).
2. Certification from the Electrician of Record (certifying electrical components of construction are installed in accordance with NFPA 70 National Electrical Code).
3. Certification and Testing from Sprinkler Contractor of Record. If the new work taps the main, then a Contractor's Test Certificate for Underground Piping will also be required.
4. Certification and Testing from Fire Alarm Contractor of Record.
5. Certification and Testing from Nurse Call System Contractor of Record (if applicable).
6. Certification and Testing of Medical Gas System Contractor of Record (if applicable).
7. Certification and Testing from Emergency Generator Contractor of Record (if applicable).
8. Certification and Testing from Elevator(s) Contractor of Record (if applicable).
9. If a hood suppression system is part of the project, then certification will be required from the installer.
10. Certificates for Interior Finishes Flame Spread Ratings.

1.3 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Clean equipment and fixtures to a sanitary condition.
- D. Replace air filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.

- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.
- 1.4 ADJUSTING
- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.
- 1.5 PROJECT RECORD DOCUMENTS
- A. Maintain electronically and one hard copy set on site of the following record documents; record actual revisions to the Work:
 - 1. Contract Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other Modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Operation and Maintenance Data, see Section 017800.
 - B. Store Record Documents separate from documents used for construction.
 - C. Record information concurrent with construction progress.
 - D. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and Modifications.
 - E. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish main floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Contract Drawings.
 - 6. Applicable specification section.
 - F. Provide two (2) sets of Record Drawings two (2) sets of Record Specifications prior to Substantial Completion and in order to obtain substantial completion per Sections 002113, Article 1.10.F and 007300, Article 9.8.
- 1.6 WARRANTIES
- A. Provide duplicate notarized copies.
 - B. Execute and assemble documents from subcontractors, suppliers, and manufacturers.
 - C. Provide Table of Contents and assemble in three D-ring binders.
 - D. Submit with Certificate of Substantial Completion in order to obtain substantial completion per Sections 002113, Part 1.10.G, 007200, and 007300, Article 9.8.

- E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.7 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections, minimum of two (2) sets. See Section 017800.
- B. Deliver to Project site prior to substantial completion in order to obtain substantial completion per Sections 002113, Article 1.10.G, 007200 and 007300, Article 9.8 and place in location as directed by Architect.

2 PART 2 - PRODUCTS
NOT USED.

3 PART 3 - EXECUTION
NOT USED.

END OF SECTION

SECTION 017100

STARTING OF SYSTEMS

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Starting systems.
- B. Demonstration and instructions.

1.2 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect/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, or other conditions which may cause damage.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of responsible Contractors' personnel 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 in conjunction with A/E in accordance with Section 014000 that equipment or system has been properly installed and is functioning correctly. In projects where a Commissioning agent is utilized this report is not needed.

1.3 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of Products to Owner's personnel prior to date of Substantial Completion. Provide video recordings of these sessions to the Architect.
- B. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.
- C. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at designated location.
- D. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

1.4 SYSTEMS MAINTENANCE

- A. Between start-up and substantial completion of the Contract as defined by Sections 007200, Article 9.8 and 007300, Article 9.8, Contractor shall maintain all equipment and systems in strict accordance with the manufacturers' instructions.

- B. As a condition of substantial completion of the Contract per Section 007300, Article 9.8, Contractor shall submit to the Owner and the Architect certifications from each manufacturer attesting that its equipment and/or system has been maintained since start-up in accordance with the manufacturers' requirements.

- C. The warranty period required by Section 007200, Article 3.5.1 and the guarantee required by Section 007300, Article 9.8.1, shall not commence upon start-up of equipment and/or systems and shall only commence upon substantial completion of the Work as defined by Section 007200, Article 9.8, and Section 007300, Article 9.8.

2 PART 2 - PRODUCTS
NOT USED.

3 PART 3 - EXECUTION
NOT USED.

END OF SECTION

SECTION 017800

OPERATION AND MAINTENANCE DATA

1 PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Format and content of manuals.

1.2 QUALITY ASSURANCE

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.3 FORMAT

- A. Prepare data in the form of an instructional manual. In addition, provide electronic, fully bookmarked PDF files of all printed materials on a USB thumb drive.
- B. Binders: Commercial quality 8-1/2 x 11 inch three-ring binders with hardback, cleanable, plastic covers. When multiple binders are used, correlate data into related consistent groupings.
- C. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; list title of Project; identify subject matter of contents.
- D. Arrange content of systems under specification section numbers and sequence of Table of Contents of this Project Manual.
- E. Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: Manufacturer's printed data, or typewritten data on 20 pound paper. Use single-sided pages if providing material printed from electronic files.
- G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

1.4 CONTENTS, EACH VOLUME

- A. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect/Engineer, sub consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
- B. For Each Product or System: List names, address and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts, and specification section number prominently displayed.
- C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

- D. Type Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 014000.
- E. Warranties and Bonds: Bind in copy of each as specified in Section 017000.
- F. Include a copy of the approved shop drawing for each product or system edited to comply with Section 017000, Part 1.5, and Project Record Documents.

1.5 MANUAL FOR MATERIALS AND FINISHES

- A. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: As specified in individual product specification Sections.

1.6 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Provide electrical service characteristics, controls and communications.
- C. Include color coded wiring diagrams as installed.
- D. Operation Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Provide servicing and lubrication schedule, and list of lubricants required.
- G. Include manufacturer's printed operation and maintenance instructions.
- H. Include sequence of operation by controls manufacturer.
- I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Provide control diagrams by controls manufacturer as installed.
- K. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

- L. Provide charts or valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Include test and balancing reports.
- O. Additional Requirements: As specified in individual product specification Sections.

1.7 INSTRUCTION OF OWNER PERSONNEL

- A. Before final inspection, instruct Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.
- B. Use operation and maintenance manuals as basis for instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- C. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

1.8 SUBMITTALS

- A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
- B. Submit one copy of completed volumes in final form 30 days prior to substantial completion inspection. Copy will be returned, with Architect comments. Revise content of documents as required prior to submittal.
- C. Submit three copies of revised volumes of data in final form 10 days prior to Substantial Completion and in order to obtain substantial completion per Sections 002113, Part 1.10.G, 007200 and 007300, Article 9.8.

2 PART 2 - PRODUCTS
NOT USED.

3 PART 3 - EXECUTION
NOT USED.

END OF SECTION

SECTION 019000

HOSPITAL REGULATIONS

1 PART 1 - GENERAL

1. DESCRIPTION:

1.1 SCOPE: To set forth regulations that shall be followed by the General Contractor and all subcontractors, including independent testing laboratory personnel, when on the grounds of the University of Mississippi Medical Center ("UMMC"), while engaged in the execution of this contract.

1.2 REGULATIONS:

- A. The Contractor shall acquaint his workmen with all UMMC traffic and parking regulations.
- B. Workmen who may, because of improper conduct or persistent violation of UMMC regulations, become objectionable will be removed by the Contractor at the request of the Owner.
- C. Workmen shall wear shirts and pants while on grounds.
- D. Organized safety measures shall be enforced on all construction work. Comply with all applicable Occupational Safety and Health Administration (OSHA) regulations.
- E. Dispose of potentially harmful debris in accordance with UMMC regulations.
- F. UMMC is a tobacco-free campus and any violators of this non-tobacco policy will be removed from the jobsite for a period of 24 hours at minimum. Any subsequent violations will result in the worker not being allowed back onsite.

1.3 HAZARD COMMUNICATION

- A. The following actions are to be taken by contractors, subcontractors and all laborers while at the University of Mississippi Medical Center.
 - 1. Schedule the work to reduce the exposure of UMMC employees and Contractor employees to Hazardous materials used on the work site.
 - 2. UMMC will provide the Contractor with an inventory of hazardous materials known to be present in the construction area.
 - 3. Contractor shall provide UMMC with an inventory of hazardous materials to be used in the construction area.
 - 4. Contractor and UMMC shall provide each other's employees with Safety Data Sheets (SDS) for all materials in the construction area to which they may be exposed.
 - 5. Provide the necessary training to protect employees. It is the responsibility of each employer to inform and train their own employee.

1.4 INTERIM LIFE SAFETY CODE MEASURES:

- A. The Contractor shall be responsible for implementing, maintaining, and enforcing the Owner's Policy for Life Safety Code Requirements in connection with the execution of this Project. This Policy, revised 12/19, is as follows.

DIVISION OF PHYSICAL SERVICES
FACILITIES SAFETY PROGRAM MANUAL
SUBJECT: Interim Life Safety Measures

Date: 7/96

DISTRIBUTION: All Manual Holders
PREPARED BY: Facilities Services

Reviewed: 7/97, 6/98, 8/00,
8/01, 7/02, 8/03, 7/04, 6-05,
8/06, 7/07, 7/99, 4/11, 4/14, 3/16,
11/17, 9/18, 4/19 Revised: 12/19

APPROVED:

Michael D. Switzer

I. PURPOSE

It is the intent of the University of Mississippi Medical Center (UMMC) to provide a level of life safety comparable to that described in all applicable occupancy chapters of Life Safety Codes (LSC) 2012 edition during any construction or renovation process that impairs the current Life Safety Code or when any Life Safety Code deficiencies are discovered and cannot be immediately resolved. Interim Life Safety Measures (ILSM) will be implemented in or adjacent to all construction areas and throughout buildings with any existing LSC deficiencies. The measures will apply to all personnel, including construction workers, and they will be implemented during project development and continuously enforced through project completion.

2. POLICY

It is the intent of the University of Mississippi Medical Center (UMMC) that during construction, renovations or when significant maintenance is being performed or if building(s) safety features are temporarily compromised, all efforts shall be made to maintain life safety measures in accordance with the Life Safety Code.

2.1 In the event this is not possible, interim life safety measures (ILSM) shall be implemented to compensate for the hazard posed by any life safety deficiencies.

3. IMPLEMENTATION

An ILSM Assessment Plan is established to provide alternate safety features whenever life safety code related features of a facility are comprised. UMMC uses the ILSM matrix and assessment tool to implement any increased safety measures which are found needed due to deficiencies noted during the life safety assessment.

3.1 All construction projects require a full ILSM. This ILSM is specific to the construction bid/project and will include provisions for implementation of all specific ILSM's listed in section 4.

3.2 UMMC uses an Interim Life Safety Pre-Assessment tool anytime that deficiencies or impairments (other than construction related) are identified to determine if a full ILSM assessment is needed.

3.2.1 The Fire Safety Specialist, General Safety Specialist or Senior Safety Officer is responsible for assessment of the project or situation and establishment of the ILSM plan.

- 3.3 The UMMC life safety matrix contains a list of common life safety code deficiencies and construction hazards which are listed as a guideline for recommended ILSMs. The actual ILSM utilized will be determined based on analysis of the specific project or situation. (See attached matrix and assessment tool section 5).
- 3.4 During review, the specific ILSM required by the ILSM Matrix and Assessment Plan will be determined to ensure the following safety measures:
 - 3.4.1 The hospital's policy allows the use of other ILSM's not addressed in EP's 2-14.
 - 3.4.2 The hospital notifies the Fire Department (or other emergency response group) and initiates a fire watch when a fire alarm is out of service more than 4 out of 24 hours or a sprinkler system is out of service more than 10 hours in a 24 hour period in an occupied building. Notification and fire watch times are documented.
 - 3.4.3 The hospital posts signage identifying the location of alternative exits to everyone affected.
 - 3.4.4 Exits in affected areas are inspected on a daily basis.
 - 3.4.5 The hospital provides temporary but equivalent fire alarm and detection systems for use when a fire alarm system is impaired.
 - 3.4.6 The hospital provides additional firefighting equipment.
 - 3.4.7 The hospital uses temporary construction partitions that are smoke tight, or made of noncombustible or limited combustible material that will not contribute to the development or spread of fire.
 - 3.4.8 The hospital increases surveillance of buildings, grounds and equipment giving special attention to construction areas and storage, excavation and field offices.
 - 3.4.9 The hospital enforces storage, housekeeping and debris removal practices that reduce the building's flammable and combustible fire load to the lowest feasible level.
 - 3.4.10 The hospital provides additional training to those who work in the hospital on the use of firefighting equipment.
 - 3.4.11 Due to the number of fire drills performed each month, The Joint Commission doesn't require the one additional fire drill per shift per quarter. See 5.2.4
 - 3.4.12 The hospital inspects and tests systems monthly. The completion date of the test is documented.
 - 3.4.13 The hospital promotes education to promote awareness of building's deficiencies, construction hazards and temporary measures implemented to maintain fire safety.
 - 3.4.14 The hospital trains those who work in the hospital to compensate for impaired structural or compartmental fire safety features.

4. PROCEDURES WITHIN INTERIM LIFE SAFETY MEASURES TO ENSURE COMPLIANCE WITH THE ELEMENTS OF PERFORMANCE LISTED IN LS.01.02 .01

When requirements for fire protection or environment and grounds safety are affected by Construction or any identified Life Safety deficiency, the University of Mississippi Medical Center will institute and document life safety measures to temporarily compensate for the hazard posed by existing life safety deficiencies.

Interim Life Safety Measures will be implemented by the University of Mississippi Medical Center to provide a level of life safety comparable to that described in all applicable occupancy chapters of NFPA 101 (LSC) 2012 edition.

ILSMs will be implemented in or adjacent to all construction areas and throughout buildings with existing Life Safety Code deficiencies. ILSMs will apply to all personnel including construction workers where NFPA 101- LSC is in effect.

Inspections, testing, training, monitoring, and evaluations will be documented according to the following procedures:

- 4.1 All exits will provide free and unobstructed egress. Temporary signage will be installed when appropriate, identifying the exit(s) for everyone affected. Personnel will receive training if alternative exits must be designated. Buildings or areas under construction will maintain escape facilities for construction workers at all times. These escape facilities will include, but not be limited to corridors, halls, fire escapes, or any other means of escape.
- 4.2 Fire alarm, detection, and suppression systems will not be impaired unless a temporary, but equivalent system is provided. Fire alarm systems inside construction areas are tested for activation monthly during the project.
- 4.3 Temporary partitions will be smoke tight and will be built of noncombustible or limited combustible materials that will not contribute to the development or spread of fire. Materials for all temporary partitions will be listed in the project specification and be approved by UMMC EH&S Office.
- 4.4 Fire-fighting equipment and training for personnel will be provided. Equipment to be used will include, but not limited to, extinguishers, extra hose, etc. depending on the type of work being done. Additional fire equipment to be provided as needed.
- 4.5 Smoking will be prohibited in or adjacent to all construction areas. NO SMOKING SIGNS will be posted in all construction or adjacent areas by contractor.
- 4.6 Housekeeping, storage, and debris removal practices that reduce the flammable and combustible fire load of the building to the lowest level necessary for daily operations will be developed and enforced. These practices will be decided on and initiated at the time construction is begun. Debris including building materials, paints, varnishes, flammable liquids, and paper will be removed as needed to reduce combustibility of the space.
- 4.7 A minimum of one fire drill per shift per quarter will be conducted. These drills will be documented and conducted by the UMMC Fire Safety Specialist.

- 4.8 Hazard surveillance of buildings, grounds, and equipment, with special attention to excavations, construction areas, construction storage, and field offices will be increased. Hazard surveillance will be performed during weekly inspections.
- 4.9 Personnel involved in construction will be trained when structural or compartmentation features of fire safety are compromised. The UMMC Fire Safety Specialist will be involved in the training of personnel.
- 4.10 Organization wide safety education programs to insure awareness of any LSC deficiencies, construction hazards, and the preceding ILSM's will be conducted.
- 4.11 The hospital notifies the Jackson Fire Department, UMMC Fire Response Team, UMMC Campus Police and initiates a fire watch when a fire alarm is out of service more than 4 hours in a 24 hour period or a sprinkler system is out of service more than 10 hours in a 24 hour period in an occupied building. Notification is by email. Fire watch times are documented in Facilities Services log book.
- 4.12 Exits in affected areas are inspected on a daily basis by at least one of the following: UMMC Construction, Fire Safety Specialist or Campus Police.

5. DOCUMENTS INCLUDED IN THE UMMC ILSM PROGRAM:

- 5.1 All documents may not be relevant for every project or situation.
 - 5.1.1 UMMC Determination of ILSM for Construction & Renovation projects
 - 5.1.2 ILSM Assessment Tool
 - 5.1.3 ILSM Life Safety Matrix
 - 5.1.4 UMMC Hot Works Permit & Fire Watch Documentation Form
- 5.2 References & Attachments
 - 5.2.1 International Fire Code 2015
 - 5.2.2 Life Safety Code 2012
 - 5.2.3 Copies of 5.1.1 thru 5.1.4 are attached beginning on page 5
 - 5.2.4 Letter omitting "one additional fire drill per shift per quarter" page 13

**UNIVERSITY OF MISSISSIPPI MEDICAL CENTER DETERMINATION
OF INTERIM LIFE SAFETY MEASURES (ILSM)
FOR CONSTRUCTION AND RENOVATION PROJECTS**

Date: _____

Project: _____

Building: _____ Floor(s): _____ Room(s): _____

Project Safety Coordinator: _____ Title: _____

General Contractor/Facilities Shop: _____

Project start date: _____ Project completion date: _____

Implementation checklist:

- Review the scope of the construction or renovation project for actions required by the ILSM matrix.
- Notify the general contractor or Shop of their responsibilities regarding ILSMs.
- Notify the maintenance/facilities department about potential shutdowns of fire alarms, sprinkler systems, smoke detector systems, etc. Prior to modifications that necessitate shutdowns, implement the necessary ILSMs to provide equivalent system protection. The Environmental Health and Safety Department will coordinate the scheduling of fire drills as appropriate.
- Develop a plan and train appropriate hospital staff and project personnel on ILSMs, including a written and signed document that attests to the training.
- Regularly inspect and report on the project site regarding ILSMs (see the ILSM checklist and fire watch documentation).

Note: If the project does not warrant implementation of ILSMs, indicate the reasons below:

EH&S Representative: _____

**University of Mississippi Medical
Center ILSM Assessment Tool**

Project: _____ Building: _____

Description: _____

Assessment Date: _____ Training Completion Date: _____

Project Start Date: _____ Estimated Completion Date: _____

Assessment Criteria	YES	NO
1. Will any egress pathways or exits be altered or obstructed? ILSM 1, 11, 12, 13, 14, 15, 16		
2. Will access to emergency services be restricted or rerouted or will access for emergency responders be impaired or restricted? ILSM 2, 10, 13, 14		
3. Will any fire detection or alarm systems be impaired? ILSM 3, 4, 7		
4. Will any part of the fire suppression or sprinkler system be impaired? ILSM 4, 6, 7, 8, 16		
5. Will any smoke/fire walls, doors, or assemblies be compromised? ILSM 10, 11, 12, 13, 15, 16		
6. Will the fire safety of personnel in adjacent areas be affected? ILSM 11, 13, 14, 15		
7. Will it be necessary to install temporary construction partitions? ILSM 5, 12, 13, 14		
8. Will the project result in the accumulation of debris and/or materials and increase the combustible load in the work area? ILSM 6, 8, 10, 13		
9. Will the project activity include significant ignition sources (cutting, welding, soldering, or other activities utilizing an open flame)? ILSM 7,9		
10. Will the project activity present any other safety-related hazards?		

Project Summary:

Approval Signatures: _____ Assessment completed by: _____

Safety Officer: _____ Date: _____

Manager of affected department: _____ Date: _____

Project Coordinator: _____ Date: _____

Contractor/Facilities representative: _____ Date: _____

ILSM/Supplemental ILSM

1. Identify and maintain alternative egress routes and exits. Install appropriate temporary signage. **EP#3.**
2. Ensure that exterior building access and exit discharges are unobstructed. Maintain access to emergency services and for emergency responders. Notify emergency responders of any obstructions or alternative routes.
3. When feasible, install temporary and equivalent fire systems. Fire systems are tested monthly. **EP#5, 12.**
4. Notify the fire department and provide a fire watch when a fire alarm is out of service more than four out of 24 hours or a sprinkler system is out of service for more than ten hours in a 24-hour period. **EP#2.**
5. Install temporary smoke/dust-tight construction partitions constructed of noncombustible or limited-combustible materials that will not contribute to the development or spread of fire. **EP#7.**
6. Provide extra fire extinguishers in the affected area and train personnel in their use. **EP#6, 10.**
7. Reduce the quantity of combustible materials in the affected area.
8. Enforce storage, housekeeping, and debris removal procedures. **EP#9.**
9. Conduct all hot work in accordance with hospital policies and procedures including Local and State regulations.
10. Increase hazard surveillance in the affected area. Include areas outside the construction project to identify material storage or vehicle parking that could obstruct egress or impede access by emergency responders. **EP#8.**

11. Train staff in the affected area. EP#14.
12. Inspect construction area exits daily. EP#4.
13. Inspect affected areas for code and ILSM compliance at least weekly.
14. Install safety, emergency information, and access control signs as appropriate.
15. Modify evacuation route/area of refuge signs as appropriate.
16. Conduct organizational wide safety education to ensure awareness of any Life Safety Code deficiencies, construction hazards, and these Interim Life Safety Measures. EP#13.

Notes:

Each construction project or deficiency may contain variables that preclude absolute use of ILSMs in a rigid manner. The measures listed with each assessment criteria line item are based on the probability that those measures will be needed to mitigate the associated risks. However, both discretion and flexibility should be utilized in defining which measures will be implemented to ensure that mitigation is closely matched to risk.

Smoking is prohibited in accordance with the Hospital Smoking/Tobacco Policy and Project Safety Requirements. Therefore, ILSMs related to smoking restrictions are not assessed.

Organization-wide safety education programs are conducted regularly to promote awareness of *Life Safety Code* deficiencies, construction hazards, and ILSMs.

University of Mississippi Medical Center

Hot Works Permit

This permit must be completed at least 24 hours prior to any hot work beginning. The permit can be issued by the Fire Safety Officer or Facilities Services staff.

Job Information

Job Name/ Number: _____
Construction Coordinator (if applicable): _____

Contractor Information

Name of Person/Company Performing Hot Work: _____
Person Supervising Hot Work: _____
Telephone Number of Person Supervising Hot Work: _____

Hot Work Location

Building: _____ Floor: _____
Work Start Date: _____ Est. Completion Date: _____
Description of Hot Work: _____

Confirm Checklist Prior To Any Work Starting

- ___ Hot Work equipment (torches, welders, gauges, cylinders etc) will be in good working condition.
- ___ If alarm devices are to be taken out of service, the fire safety office should be notified at **601-815-9554**.
- ___ Locate each smoke detector, duct detector and sprinkler head to assure that the products of the hot work will not falsely activate the fire alarm system.
- ___ Locate the nearest fire alarm pull station prior to starting work. Be sure all staff are aware of the fire reporting number **601-984-6666**.
- ___ Confirm that all floors in the work area are clean and free of combustibles and debris. Any combustibles that cannot be moved at least 35' from the work area must be protected with fire rated covers. (No standard tarps allowed)
- ___ All Floor openings including cracks within 35' of the work area must be covered with fire rated covers.
- ___ Adequate portable fire extinguishers and staff trained in the use of them will be on site during the hot work process. A minimum 10 lb. ABC fire extinguisher must be on site at all times. All fire extinguishers must be tagged and compliant with NFPA 10.
- ___ Confirm that staff will not be exposed to toxic fumes from the hot work taking place. Air monitoring may be necessary.
- ___ The person performing the hot work or the project supervisor will verify that the conditions specified in this permit are met prior to the beginning of any hot work each day that the permit is in effect. In addition, they will complete the Hot Work Fire Watch Form each day that Hot Work Occurs.

Person performing work/ supervisor signature: _____
Date: _____

Person Issuing Permit Signature: _____
Date: _____

This Permit Expires on the date stated as completion date.

University of Mississippi Medical Center ILSM Assessment Permit

Assessment Date: _____ Project Dates: _____

Project: _____ Building: _____

Description: _____

Assessment Criteria	YES	NO
1. Will any egress pathways or exits be altered or obstructed? ILSM 1, 11, 12, 13, 14, 15, 16		
2. Will access to emergency services be restricted or rerouted or will access for emergency responders be impaired or restricted? ILSM 2, 10, 13, 14		
3. Will any fire detection or alarm systems be impaired? ILSM 3, 4, 7		
4. Will any part of the fire suppression or sprinkler system be impaired? ILSM 4, 6, 7, 8 16		
5. Will any smoke/fire walls, doors, or assemblies be compromised? ILSM 10, 11, 12, 13, 15, 16		
6. Will the fire safety of personnel in adjacent areas be affected? ILSM 11, 13, 14, 15		
7. Will it be necessary to install temporary construction partitions? ILSM 5, 12, 13, 14		
8. Will the project result in the accumulation of debris and/or materials and increase the combustible load in the work area? ILSM 6, 8, 10, 13		
9. Will the project activity include significant ignition sources (cutting, welding, soldering, or other activities utilizing an open flame)? ILSM 7, 9		
10. Will the project activity present any other safety-related hazards?		

Interim Life Safety Measures Highlighted Yellow Are Active for this Project

ILSM	Follow all UMMC ILSM Safety Training & General Project Safety Requirements
1	Identify and maintain alternative egress routes and exits. Install appropriate temporary signage. EP#3
2	Ensure that exterior building access and exit discharges are unobstructed. Maintain access to emergency services and for emergency responders. Notify emergency responders of any obstructions or alternative routes.
3	When feasible, install temporary and equivalent fire systems. Test temporary systems monthly. EP#5, 12
4	Notify the fire department and provide a fire watch whenever a fire alarm is out of service for more than four hours in a 24-hour period or automatic sprinkler system is out of service for more than ten hours in a 24-hour period. EP#2
5	Install temporary smoke/dust-tight construction partitions constructed of noncombustible or limited- combustible materials that will not contribute to the development or spread of fire. EP#7
6	Provide extra fire extinguishers in the affected area and train personnel in their use. EP#6, 10
7	Reduce the quantity of combustible materials in the affected area.
8	Enforce storage, housekeeping, and debris removal procedures. EP#9
9	Conduct all hot work in accordance with hospital policies and procedures, and Local and State regulations.
10	Increase hazard surveillance in and around the affected area. EP#8
11	Train staff in the affected area. EP#14
12	Inspect construction area exits daily. EP#4
13	Inspect affected areas for code and ILSM compliance at least weekly.
14	Install safety, emergency information, and access control signs as appropriate.
15	Modify evacuation route/area of refuge signs as appropriate.
16	Conduct organizational wide safety education to ensure awareness of any Life Safety Code deficiencies, construction hazards, and these Interim Life Safety Measures. EP#13

UMMC Safety Officer: _____

If any violations are noted, please contact the UMMC Fire Safety Specialist at 601-815-9554.

Interim Life Safety Measures Matrix - Construction Project Area:		Assessment												
Date of Assessment:		1. Fire Watch Only	2. Notify Emergency Forces & establish / document a fire suppression system out >10 hr in a 24 hour period	3. Identify alternate exits to all affected areas	4. Inspect exits in affected areas on a daily basis	5. Provide temporary but equivalent fire alarm and detection system when a system is impaired	6. Provide additional firefighting equipment as needed	7. Provide temporary smoke-tight or non/limited combustible material partitions	8. Increase surveillance of area, particularly construction areas, storage, excavation & field offices	9. Enforce storage, housekeeping & debris removal practices that reduce flammable & combustible fire load	10. Provide additional training to employees on the use of firefighting equipment	11. Inspect and test temporary systems monthly	12. Conduct education (Emergency Forces or staff) to promote awareness of building deficiencies, construction hazards and ILSM	13. Provide training to staff structural or compartmental fire safety features

Deficiencies															
1	Patient room door latching issue						X		X	X			X		X
2	Lack a code complying smoke barrier						X		X	X			X		X
3	Fire exit stairs discharge improperly		X										X		X
4	Excessive travel distance to an approved exit								X				X		X
5	Lack of two remote exits				X				X				X		X
6	Nonconforming building construction type						X		X				X		X
7	Improperly protected vertical openings								X				X		X
8	Large penetrations in fire barriers								X				X		X
9	Corridor walls do not extend to the structure								X				X		X
10	Hazardous areas not properly protected								X				X		X

Construction Related Issues															
11	Blocking off an approved exit		X						X				X		X
12	Rerouting of traffic to emergency room		X						X				X		X
13	Major renovation of an occupied floor		X		X				X	X			X		X
14	Replacing fire alarm system (out of service)		X		X				X	X			X		X
15	Installing sprinkler system (out of service)		X		X				X	X			X		X
16	Significantly modifying smoke or fire barrier walls		X		X				X	X			X		X
17	Adding an addition to an existing structure		X		X				X	X			X		X

Maintenance and Testing															
18	Taking a fire alarm system out of service		X		X				X				X		X
19	Taking a sprinkler system out of service		X		X				X				X		X
20	AHU Shutdown Devices and Duct Detectors	X													
21	Breach in Fire/Smoke barrier due to malfunction damper, Roll down fire doors, Won doors, Fire doors	X													
22	3 or more initiating devices: Audible and visuals, Electromechanical releasing devices, smoke detectors, Pull stations	X													

ILSM's to be implemented as identified for construction items 1-22, as noted on this grid.

Please check mark in Assessment box to indicate projected deficiency. Project Meets ILSM Requirement Yes _____ No _____

Additional Comments:

Sr. Safety Officer (601) 984-1983
Fax (601) 984-1988
General Safety (601) 984-1982
Fire Safety (601) 815-9554

Radiation Safety (601) 984-1989
Biological and
Chemical Safety (601) 984-1981

Project # _____

UMMC Project Safety Requirements

The requirements below are applicable for all projects at UMMC. This document along with the ILSM requirements set in place by EH&S shall be followed at all times by everyone involved in a construction/facilities project at UMMC.

(1) Emergency Phone Numbers

- Number for reporting any Fire Event – 601-984-6666.
- Number for UMMC Campus Police – 601-815-7777.
- Number for reporting a Facilities Emergency – 601-984-1420.

(2) UMMC Fire Response & Extinguisher Use Procedures

- All fire response follows the **RACE** system. **R**escue, **A**larm, **C**onfine, **E**xtinguish.
- When using a fire extinguisher follow the **PASS** system. **P**ull, **A**im, **S**queeze, **S**weep

(3) Project Supervisors responsibility for Safety

- The Project supervisor shall ensure anyone on a UMMC jobsite shall adhere to each item listed in this document as well as all interim life safety measures which are in place for their project.
- This document shall be posted at the job site by the project supervisor.
- Documentation via sign in sheet of this training for each worker on site is the responsibility of the project supervisor. This documentation is required to be turned in to UMMC's project manager at the projects monthly progress meeting.

(4) Identification Badges

- All workers shall wear an ID badge when working at any UMMC location.
- This badge should contain the company name, job name and number.
- Badges should be worn in plain sight at all times while on location at UMMC.

(5) Smoking, E-Cigarettes & Tobacco Use

- The medical center prohibits smoking, e-cigarettes or the use of any tobacco products on the campus, in all the buildings on the campus, in any facility the institution operates and on land the Medical Center owns or operates.
- Violators can and will be asked to leave the job site.
- No Smoking signs shall be posted in all construction or adjacent areas by the contractor.

(6) Required Project Permits

- **ILSM Permit(s)** – are issued after the ILSM assessment for the project. This permit shall be laminated or in a plastic sleeve and posted on the jobsite at all times.
- **Hot Works Permit** - is issued after the ILSM assessment for the project. This shall be laminated or in a plastic sleeve and posted on the jobsite at all times.
- **Above Ceiling Permit** - is issued after the ILSM assessment for the project. This shall be laminated or in a plastic sleeve and attached to ladder(s) working outside of the project barriers.

(7) Hot Works

- Any type work performed which creates a spark, uses an open flame or produces excessive heat is considered Hot Works and requires a current Hot Works Permit.
- All hot works are to be performed in accordance with the requirements of the UMMC Hot Works policy.
- Daily fire watch documentation form shall be completed each time hot works are conducted. It shall be kept available on site for review upon request. See Hot Works Policy.
- An additional fire extinguisher is required onsite for each area Hot Works are being performed in. The extinguisher(s) shall meet all requirements of section 13.

(8) Above Ceiling Work

- Any time above ceiling work is performed outside of the project boundary partitions the project worker must have the above ceiling permit attached to their ladder.
- It is the responsibility of the project supervisor to make sure all parts of the above ceiling permit policy are followed throughout the project.
- All junction boxes new or existing located inside the construction project shall be properly closed prior to the above ceiling inspection.
- All fire suppression/sprinkler piping inside the construction area shall be free from any items attached to, suspended from or laying on the piping prior to the above ceiling inspection.
- All fire wall penetrations new or existing located inside the project area shall be properly fire sealed prior to the Above Ceiling Inspection.

(9) Fire Stopping

- Any/all penetrations in fire, smoke or suite barrier wall along with floor or ceiling deck separations are to be properly fire stopped by a UMMC approved contractor.
- All penetrations in a fire/smoke barrier wall, floor slab or ceiling deck which is being used for a project boundary are to be properly fire sealed at all times unless actively working in the opening.

(10) Electrical Safety

- All extension cords are required to have a ground prong in place on the male plug.
- All electrical cords are required to be free of nicks, cuts, tears.
- Repairs to an electrical cord using tape, glue, etc. are not allowed.

(11) Temporary Partitions & Temporary Construction Partitions

- Temporary Partitions shall be soft plastic, hard wall or modular wall system. The type of construction partitions used will be determined during the ILSM assessment meeting.
 - a. **Soft plastic:** 6 mil, roll type fire retardant material. Tape used to secure a soft barrier shall be fire retardant tape. Use of this wall system may not be allowed in non-sprinkled areas.
 - b. **Wall rated:** Metal stud, gypsum board wall, properly taped, mudded and fire stopped for a 1-2 hour fire wall. This type wall will be required where the construction barrier is replacing an existing 1-2 hour wall or during the ILSM assessment it is determined a 1 or 2 hour fire rated construction barrier is needed. This wall should extend from the floor to the deck above containing a compliant 45 to 90 minute self-closing and latching door. Fire dampers are not required in a construction barrier.
 - c. **Wall non-rated:**
 - i. Metal stud, gypsum board wall, properly taped, mudded and sealed where a construction barrier wall is not replacing a fire rated wall or required to be rated during the project. Door should be self-closing and positive latching. Tape used to secure a soft barrier shall be fire retardant tape. Use of this wall system may not be allowed in non-sprinkler areas.
 - ii. Modular wall system with a latching door. Wall cannot allow smoke or flame spread. These walls shall be capable of being sealed to existing walls and ceiling with fire retardant tape. If the ceiling is removed inside the project area this barrier shall extend from the floor to the deck above. Use of this wall system may not be allowed in non-sprinkled areas.
 - d. Wood cannot be used in any partition or barrier.
 - e. Construction Area Do Not Enter signs are required at each entrance point in the partition.
 - f. If the ceiling is removed inside the project area. The required barrier shall extend from the floor to the deck above.
 - g. Any temporary partition placed in a hospital corridor will maintain a minimum of 6' clear corridor width unless special provision is given by safety officer during the ILSM assessment meeting.

(12) Sprinklers

- Existing sprinkler heads cannot be obstructed by a construction partition or wall. If a partition will obstruct or block a sprinkler head, the project supervisor shall notify the UMMC EH&S office of the location(s). If deemed necessary by UMMC Safety Office, the project will add additional sprinkler heads for compliant fire protection in the affected area(s).
- When the ceiling is removed inside a project area. The sprinkler heads in that area shall be turned to the upright position and replaced with upright heads.
- In conjunction with the new ceiling installation, a compliant sprinkler system designed for the space shall be installed.
- Any sprinkler head which is removed shall be replaced with a new, quick response sprinkler head.
- At no time during a project should anything be attached to, placed on or suspended from a fire sprinkler system.

(13) Fire Extinguishers

- If determined during the ILSM meeting a fire extinguisher is required. A minimum of one project provided compliant fire extinguisher will be in place.
- The number of extinguishers required for a project will be determined by UMMC EH&S during the ILSM assessment meeting.
- Additional contractor furnished fire extinguishers may be required by UMMC EH&S at any time during the project if deemed necessary by UMMC EH&S office.
- Unless otherwise specified by UMMC EH&S, all fire extinguishers shall be a **10#ABC**.
- All extinguishers shall be tested, tagged and sealed with an annual inspection punch and or manufacture date of not less than 12 months from the current date.
- UMMC EH&S will conduct the required monthly inspections of project provided extinguishers.
- Extinguishers shall be securely mounted at least 4" from the ground, fully accessible and in plain sight at all times.
- If a UMMC extinguisher is in place inside the project area when the project begins. The project supervisor shall notify the UMMC Fire Safety Specialist at 601-815-9554 within the first week of the project to have it removed.
- If a UMMC fire extinguisher and/or cabinet located inside the project area needs to be relocated outside of the project area for continued staff use. It will be the project supervisor's responsibility to relocate the extinguisher and/or cabinet to the location determined by UMMC EH&S.

(14) Fire Alarm System

- It is the project supervisor's responsibility to be aware of the location(s) for all fire alarm devices inside the project area.
- When project work may produce dust, vapors, mist or smoke, fire alarm initiation devices inside the project area should be covered before starting work and disabled thru Facilities Services. Ex. Smoke and duct detectors.
- It is the project supervisor's responsibility to contact Facilities Services at 601-984-1420 giving the EMT a room location, device type and device point number, *ex. WC299-01, Smoke Detector, M1-8*, for each device needing to be disabled.
- It is the project supervisor's responsibility to contact Facilities Services and have each device placed back in normal operation before leaving the project site each day.
- If the projects work produces dust, vapors, mist or smoke. Fire alarm initiation devices are allowed to be covered each day while work is taking place in their area. *Make sure all devices have been uncovered at the end of the day before leaving the project site. No fire alarm device should be kept covered and/or disabled overnight without permission from UMMC EH&S.*
- If the projects work doesn't produce dust, vapors, mist or smoke. All fire alarm devices are expected to remain fully operational throughout the project.

(15) Inspections

- The project supervisor is to ensure daily compliance with all project safety requirements and interim life safety measures.
- When required, daily site inspections are conducted by either UMMC Construction Department or UMMC Facilities Services.
- Required, weekly site inspections are conducted by UMMC EH&S.
- Required weekend and holiday egress inspections are conducted by UMMC Campus Police.

- The project supervisor's daily inspection should include trash and construction debris being removed on a daily basis.
- Any safety deficiencies found during an inspection should be corrected immediately.

(16) Egress

- Egress pathways (Halls, Corridors, Isles, doors, etc.) are required to be free of any object or material which may impede egress.
- If work is required in a travel or egress path:
 - a. Needed measures should be taken to ensure normal travel is not interrupted.
 - b. Workers shall be prepared to remove all equipment/material immediately in the event of an emergency.
- When working on a ladder in a normal path of travel. A spotter should be provided by the project supervisor at all times.

(17) Compressed Gas Cylinders

- Compressed Gas Cylinders (CGC) are required to be secured at all times. Cylinders laying on any surface or can be turned over from an upright position are not considered to be secure.

(18) Parking

- Parking for contractors will be determined by either the UMMC Construction Office or UMMC Facilities Services.
- No vehicle is allowed to be parked in any Fire Lane.
- No vehicle is allowed to be parked on a sidewalk outside of the construction boundary.

(19) Construction Signs

- Construction and Access Control signs should be posted at all project entry points.
- All paper signs shall be laminated and attached with fire retardant tape.

(20) Emergency Response Vehicle Access

- Access routes for all emergency response vehicles must be maintained to every building at all times.
- Road closures must be identified and assessed with the UMMC EH&S prior to closing any access road.

Upon reviewing this information with your workers have them fill out the provided sign in sheet(s). A copy of the sign in sheets should remain on the project site for review during weekly inspections.

Project Supervisor Sign: _____ Date: _____

Jeff Pinter
 Environmental Health and Safety
 General Safety Specialist
 University of MS Medical Center
 Office: (601)815-9554
 Cell: (769)798-9968

No Smoking/No Tobacco

- The following items are strictly prohibited from being used at any UMMC location:
 - E-Cigarettes or Vaping
 - Smoking Tobacco
 - Chewing Tobacco
 - Dipping Tobacco



University of Mississippi Medical Center
Office of Planning, Design and Construction

**PRE-CONSTRUCTION RISK ASSESSMENT
FOR
CONSTRUCTION AND RENOVATION PROJECTS**

PROJECT NAME: _____

PROJECT NUMBER: _____

PROJECT MANAGER: _____

ARCHITECT/ENGINEER: _____

Sections 1-9 to be filled out by the Project Manager:

1. Type of Construction Activity: A B C D

Type A *Inspection and non-invasive activities such as:*

- Removal of ceiling tiles for visual inspection limited to 1 tile per 50 sf.
- Painting (no sanding)
- Wall covering, electrical trim work, minor plumbing, and activities which do not generate dust or require cutting of walls or access to ceilings other than for visual inspection. Noise/vibration not anticipated.

Type B *Small scale, short duration activities which create minimal dust such as:*

- Installation of telephone and computer cabling
- Access to chase spaces, minimum noise/vibration possible
- Cutting of walls or ceilings where dust migration can be controlled

Type C *Work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies such as:*

- Sanding of walls for painting or wall covering
- Removal of floor coverings, ceiling tiles and casework
- New wall construction, scheduling noise and vibration disruptions
- Minor ductwork or electrical work above ceilings
- Major cabling activities
- Any activity which cannot be completed within a single work shift

Type D *Major demolition and construction projects such as:*

- Activities which require consecutive work shifts
- Requires heavy demolition or removal of a complete cabling system
- New construction. Requires coordination and planning to minimize noise, vibration and other potential disruptive activities.

2. Patient Risk Group: Low Medium High Highest

Low	Medium	High	Highest
<ul style="list-style-type: none"> • Office Areas 	<ul style="list-style-type: none"> • Cardiology • Echocardiography • Endoscopy • Nuclear Medicine • Respiratory Therapy • Physical Therapy • Radiology / MRI 	<ul style="list-style-type: none"> • CCU • Emergency Room • Labor & Delivery • Laboratories (specimen) • Newborn Nursery • Outpatient Surgery • Pediatrics • Pharmacy • Surgical Units • PACU 	<ul style="list-style-type: none"> • Any area caring for immunocompromised patients • Burn Unit • Cardiac Cath Lab • Central Sterile Supply • ICU • Medical Unit • Neg Pressure Iso Rooms • Oncology • ORs including C-Section

Note: *If more than one risk group will be affected, select the higher risk group*

3. Class/Level of Precaution: I II III IV V III/IV

Patient Risk Group	Type A	Type B	Type C	Type D
Low	I	II	II	III/IV
Medium	I	II	III	IV
High	I	II	III/IV	IV
Highest	II	III/IV	III/IV	IV

Note: Infection Prevention approval will be required when the Construction Activity and Risk Level indicate that Class III or Class IV control procedures are necessary.

4. Potential Impact of Surrounding Areas:

Unit Below	Above	Lateral	Lateral	Behind	Front
Risk Group					

5. Specific Site of Activity:

6. Utility Issues:

7. Containment Measures:

- Solid Wall Barriers Temporary Wall Barriers Traffic Flow
 Housekeeping Removal of Debris
 Other _____

8. Risk of Water Damage:

- Walls Compromised Ceiling Compromised Roof Compromised
 N/A Other _____

9. Work Hours:

- During non-patient care hours During regular patient care hours
 Scheduled for least interruption
 Noise, vibration and other potential disruptive actions to be coordinated for least impact on patient areas

Comment: _____

Section 10 to be filled out by the Project Manager and Infection Prevention:

10. Infection Prevention Construction Permit:

See Appendix "A" for Infection Control Permit to be executed and issued to contractor

- Permit reviewed and issued
- Permit not required

Section 11-12 to be filled out by Environmental Health & Safety:

11. Interim Life Safety Assessment

- Interim Life Safety Measures **ARE** required per Risk Management Assessment. Daily inspections log is required for documentation.
- Interim Life Safety Measures **ARE NOT** required

12. Interim Life Safety Measures

Interim Life Safety Measures, Appendix "B" reviewed with contractor by Environmental Health & Safety.

- Yes No N/A

Comment: _____

Appendix A

INFECTION PREVENTION CONSTRUCTION PERMIT					
PROJECT NAME:			PERMIT NO:		
Location of Construction:			Project Start Date:		
Project Manager:			Estimated Duration:		
Contractor Performing Work:			Permit Exp Date:		
Supervisor:			Phone:		
YES	NO	CONSTRUCTION ACTIVITY	YES	NO	INFECTION CONTROL RISK GROUP
		TYPE A: Inspection, non-invasive activity			GROUP 1: Low risk
		TYPE B: Small scale, short duration, minimal dust			GROUP 2: Medium risk
		TYPE C: Activity generates moderate to high dust, requires more than 1 work shift to complete work, noise/vibration consideration			GROUP 3: High risk
		TYPE C: Major duration and construction activities requiring consecutive work shifts			GROUP 4: Highest risk
Class I		1. Execute work by methods to minimize raising dust from construction operations 2. Immediately replace any ceiling tile displaced for visual inspection			3. Minor demolition for remodeling
Class II		1. Provides active means to prevent air-borne dust from dispersing into atmosphere 2. Water mist work surfaces to control dust while cutting 3. Seal unused doors with duct tape 4. Block off and seal air vents, coordinate noise and vibration related issues			5. Contain construction waste before transport in tightly covered containers 6. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area 7. Place dust mat at entrance and exit of work area 8. Remove or isolate HVAC system in areas where work is being performed
Class III		1. Obtain infection control permit before construction begins 2. Isolate HVAC system in area where work is being done to prevent contamination of the duct system 3. Complete all critical barriers or implement control cube method before construction begins 4. Maintain negative air pressure within worksite utilizing HEPA equipped air filtration units. Control noise/vibration 5. Do not remove barriers from work area until complete project is thoroughly cleaned by Environmental Services			6. Vacuum work area with HEPA filtered vacuums 7. Wet mop with disinfectant 8. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction 9. Contain construction waste before transport in tightly covered containers 10. Cover transport receptacles or carts. Tape covering 11. Remove or isolate HVAC system in areas where work is being performed
Class IV		1. Obtain infection control permit before construction begins 2. Isolate HVAC system in area where work is being done to prevent contamination of the duct system 3. Complete all critical barriers or implement control cube method before construction begins 4. Maintain negative air pressure within worksite utilizing HEPA equipped air filtration units. Control noise/vibration 5. Seal holes, pipes, conduits and punctures appropriately 6. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site			7. All personnel entering work site are required to wear shoe covers 8. Do not remove barriers from work area until complete project is thoroughly cleaned by Environmental Services 9. Vacuum work area with HEPA filtered vacuums 10. Wet mop with disinfectant 11. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction 12. Contain construction waste before transport in tightly covered containers 13. Cover transport receptacles or carts. Tape covering 14. Remove or isolate HVAC system in areas where work is being performed
Additional Comments:					
Permit requested/accepted by:			Permit authorized/issued by:		
Contractor: _____ Date: _____			Project Manager: _____ Date: _____ Infection Prevention: _____ Date: _____		

IPC Permit NOT required for Class I & II, review/incorporate above requirements with general contractor before work begins

END OF SECTION

Demolition

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Building demolition excluding removal of hazardous materials and toxic substances.
 - B. Selective demolition of building elements for alteration purposes.
 - C. Abandonment and removal of existing utilities and utility structures.
2. RELATED REQUIREMENTS
 - A. Section 01.1000 - Summary of Work
 - B. Section 01.1400 - Alteration Project Procedures
 - C. Section 01.1450 - Cutting and Patching
 - D. Section 01.4000 - Contract Quality Control
 - E. Section 01.5000 - Construction Facilities and Temporary Controls
3. 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.
4. 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 and fences.
 2. Identify demolition firm and submit qualifications.
 3. 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

1. SCOPE
 - A. Remove portions of the existing interior and exterior fit-out construction as indicated in the drawings.
 - B. Saw-cut and remove portions of the existing slab-on-grade as indicated on the drawings to relocate utilities.
 - C. Completely remove all items for alteration as indicated in the Drawings. Remove other incidental items (i.e. adhesives, fasteners, etc...) as required so remaining substrate is properly prepared for subsequent work..
 - D. Remove other items indicated, for salvage and relocation.
 - E. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill equal in bearing strength to and similar in overall properties to existing fill. .
2. 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 all UMMC requirements and regulations.
 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. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 8. Do not close or obstruct roadways or sidewalks without permit.
 9. Conduct operations to minimize 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.
 10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- 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 structures and other elements that are not to be removed.
 1. Provide bracing and shoring.
 2. Prevent movement or settlement of adjacent structures.
 3. Stop work immediately if adjacent structures appear to be in danger. Do not resume operations until conditions have been corrected and / or secured.
 - F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
 - G. If unanticipated mechanical, plumbing, electrical or structural elements are found to be in conflict with the design as documented in the drawings and specifications, investigate and measure the nature and extent of the conflict. Submit written report documenting the conflict to Architect.
 - H. If 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. Comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.
3. 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.
 - 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; 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.
 - H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.
4. SELECTIVE DEMOLITION FOR ALTERATIONS
- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only. The Owner assumes no responsibility for the actual condition of items or structures to be removed.
 1. Verify that construction and utility arrangements are as 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. Separate areas in which demolition is being conducted from other areas that are still occupied.
 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01.5000 as required to perform the work and comply with UMMC requirements..
 - C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
 - D. 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.
 - E. 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 replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 3. Verify that abandoned services serve only abandoned facilities before removal.
 4. 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.
 - F. Protect existing work to remain.
 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.
5. **DEBRIS AND WASTE REMOVAL**
 - A. Remove debris, junk, and trash from site.
 - B. Leave site in clean condition, ready for subsequent work.
 - C. Clean up spillage and wind-blown debris from public and private lands.
 6. **DAMAGE AND REPAIR**
 - A. Damage to adjacent construction or surfaces caused by demolition work is to be repaired to match conditions prior to the start of demolition.
 - B. All repairs are to be made promptly and at no additional cost to the Owner.

END OF SECTION

Concrete Forms and Accessories

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.
 - B. Openings for other work.
 - C. Form accessories.
 - D. Form stripping.
2. RELATED REQUIREMENTS
 - A. Section 03.2000 – Concrete Reinforcement.
 - B. Section 03.3000 – Cast-In-Place Concrete.
3. REFERENCE STANDARDS
 - A. ACI 117.1R – Guide for Tolerance Compatibility in Concrete Construction; American Concrete Institute; 2014.
 - B. ACI 301 – Specifications for Structural Concrete for Buildings; American Concrete Institute; 2016.
 - C. ACI 318 – Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute; 2014.
 - D. ACI 347R – Guide to Formwork for Concrete; American Concrete Institute; 2014.
 - E. PS 1 – Structural Plywood; 2009.
4. SUBMITTALS
 - A. Section 01.3000 – Administrative Requirements, for submittal procedures.
 - B. Shop Drawings: Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.
5. QUALITY ASSURANCE
 - A. Designer Qualifications: Design elevated formwork under direct supervision of a professional engineer experienced in design of concrete formwork and licensed in the state in which the project is located.

PART 2 PRODUCTS

1. FORMWORK - GENERAL
 - A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.
 - B. Design and construct to provide resultant concrete that conforms to design with respect to shape, lines, and dimensions.
 - C. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.
 - D. Comply with relevant portions of ACI 347, ACI 301, and ACI 318.
 - E. All concrete exposed to view shall be plywood formed.
2. WOOD FORM MATERIALS
 - A. Softwood Plywood: PS 1, C Grade, Group 2.
3. FORMWORK ACCESSORIES
 - A. Form Release Agent: Colorless mineral oil that will not stain concrete.

PART 3 EXECUTION

1. EXAMINATION
 - A. Verify lines, levels, and centers before proceeding with formwork. Ensure that dimensions agree with drawings.
2. ERECTION - FORMWORK
 - A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.

- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
 - C. Align joints and make watertight. Keep form joints to a minimum.
 - D. Obtain approval before framing openings in structural members that are not indicated on drawings.
 - E. Coordinate this section with other sections of work that require attachment of components to formwork.
3. APPLICATION - FORM RELEASE AGENT
- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
 - B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
 - C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.
4. INSERTS, EMBEDDED PARTS, AND OPENINGS
- A. Provide formed openings where required for items to be embedded in passing through concrete work.
 - B. Locate and set in place items that will be cast directly into concrete.
 - C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
 - D. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.
 - E. Install waterstops in accordance with manufacturer's instructions, so they are continuous without displacing reinforcement. Heat seal joints so they are watertight.
 - F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
 - G. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.
5. FORM CLEANING
- A. Clean forms as erection proceeds, to remove foreign matter within forms.
 - B. Clean formed cavities of debris prior to placing concrete.
6. FORMWORK TOLERANCES
- A. Construct formwork to maintain tolerances required by ACI 117.
7. FIELD QUALITY CONTROL
- A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.
 - B. Do not reuse wood formwork more than 3 times for concrete surfaces to be exposed to view. Do not patch formwork.
8. FORM REMOVAL
- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
 - B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
 - C. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

END OF SECTION

Concrete Reinforcement

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Reinforcing Steel for Cast-In-Place Concrete.
 - B. Supports and Accessories for Steel Reinforcement.
2. RELATED REQUIREMENTS
 - A. Section 03.1000 – Concrete Forms and Accessories.
 - B. Section 03.3000 – Cast-In-Place Concrete.
3. REFERENCE STANDARDS
 - A. ACI 301 – Specifications for Structural Concrete for Buildings; American Concrete Institute; 2016.
 - B. ACI 318 – Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute; 2014.
 - C. ACI SP-66 – ACI Detailing Manual; American Concrete Institute; 2004.
 - D. ASTM A 615 – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2016.
 - E. CRSI – Manual of Standard Practice; Concrete Reinforcing Steel Institute; 2009.
4. SUBMITTALS
 - A. Section 01.3000 – Administrative Requirements, for submittal procedures.
 - B. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
 - C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.
 - D. Reports: Submit certified copies of mill test report of reinforcement materials analysis.
5. QUALITY ASSURANCE
 - A. Perform work of this section in accordance with ACI 301.

PART 2 PRODUCTS

1. REINFORCEMENT
 - A. Reinforcing Steel: ASTM A 615 Grade 60.
 - B. Reinforcement accessories:
 1. Tie wire: annealed, minimum 16 gage.
 2. Chairs, bolsters, bar supports, spacers: sized and shaped for adequate support of reinforcement during concrete placement.
2. FABRICATION
 - A. Fabricate concrete reinforcing in accordance with CRSI – Manual of Standard Practice.
 - B. Welding of reinforcement is not permitted.
 - C. Locate reinforcing splices not indicated on drawings at point of minimum stress.

PART 3 EXECUTION

1. PLACEMENT
 - A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
 - B. Conform to applicable code for concrete cover over reinforcement.

END OF SECTION

Cast-In-Place Concrete**PART 1 GENERAL**

1. SECTION INCLUDES
 - A. Concrete Floors.
2. RELATED REQUIREMENTS
 - A. Section 03.1000 – Concrete Forms and Accessories.
 - B. Section 03.2000 – Concrete Reinforcement.
3. REFERENCE STANDARDS
 - A. ACI 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute; 1991 (Reapproved 2002).
 - B. ACI 301 – Specifications for Structural Concrete for Buildings; American Concrete Institute; 2016.
 - C. ACI 302.1R – Guide for Concrete Floor and Slab Construction; American Concrete Institute; 2015.
 - D. ACI 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute; 2000(Reapproved 2009).
 - E. ACI 305R – Guide to Hot Weather Concreting; American Concrete Institute; 2010.
 - F. ACI 306R – Guide to Cold Weather Concreting; American Concrete Institute; 2016.
 - G. ACI 308R – Guide to External Curing of Concrete; 2016.
 - H. ACI 318 – Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute; 2014.
 - I. ASTM C 33 – Standard Specification for Concrete Aggregates; 2016.
 - J. ASTM C 39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2017.
 - K. ASTM C 94 – Standard Specification for Ready-Mixed Concrete; 2014.
 - L. ASTM C 143 – Standard Test Method for Slump of Hydraulic-Cement Concrete; 2015.
 - M. ASTM C 150 – Standard Specification for Portland Cement; 2015.
 - N. ASTM C 171 – Standard Specification for Sheet Materials for Curing Concrete; 2016.
 - O. ASTM C 260 – Standard Specification for Air-Entraining Admixtures for Concrete; 2010.
 - P. ASTM C 309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
 - Q. ASTM C 494 – Standard Specification for Chemical Admixtures for Concrete; 2017.
 - R. ASTM C 618 – Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2017.
 - S. ASTM C 1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2017.
 - T. ASTM D 994 – Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type); 2011 (Reapproved 2016).
 - U. ASTM D 1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
 - V. ASTM E 1155 – Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 2014.
 - W. COE CRD–C 513 – COE Specifications for Rubber Waterstops; Corps of Engineers; 1974.
4. SUBMITTALS
 - A. Section 01.3000 – Administrative Requirements, for submittal procedures.
 - B. Samples: Submit two, 6-inch-long samples of construction joint devices.
5. QUALITY ASSURANCE
 - A. Perform work of this section in accordance with ACI 301 and ACI 318.
 - 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

1. CONCRETE MATERIALS
 - A. Cement: ASTM C 150, Type I or II – Normal Portland type.
 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.
 2. Course aggregate shall have max aggregate size of ½”.
 - C. Fly Ash: ASTM C 618, CLASS C or F.
 - D. Water: Clean and not detrimental to concrete.
2. CHEMICAL ADMIXTURES
 - A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
 - B. Air Entrainment Admixture: ASTM C 260.
 - C. Water Reducing and Accelerating Admixture: ASTM C 494 Type E.
3. ACCESSORY MATERIALS
 - A. Non-Shrink Grout: ASTM C 1107; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 1. Minimum compressive strength at 28 days: 7,000 PSI.
 - B. Moisture-Retaining Cover: ASTM C 171; regular curing paper, white curing paper, clear polyethylene, white polyethylene, or white burlap-polyethylene sheet.
 - C. Liquid Curing Compound: ASTM C 309, Type 1, clear or translucent.
5. CONCRETE MIX DESIGN
 - A. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
 - B. Normal Weight Concrete:
 1. Compressive strength, when tested in accordance with ASTM C 39 at 28 days: as indicated on drawings.
 2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
 3. Water-Cement Ratio: Maximum 45 percent by weight.
 4. Maximum Slump: 4 inches.
8. MIXING
 - A. Transit Mixers: Comply with ASTM C 94.

PART 3 EXECUTION

1. EXAMINATION
 - A. Verify lines, levels, and dimensions before proceeding with work of this section.
2. PREPARATION
 - A. 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.
3. 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 48 hours prior to commencement of placement operations.
 - D. Install joint devices in accordance with manufacturer's instructions.
 - E. Place concrete continuously between predetermined construction joints.
 - F. Do not interrupt successive placement; do not permit cold joints to occur.

4. CONCRETE FINISHING
 - A. Repair surface defects, including tie holes, immediately after removing formwork.
 - B. Unexposed form finish: rub down or chip off fins or other raised areas 1/4 inch or more in height.
 - C. Exposed form finish: rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 1. Smooth rubbed finish: wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
 - D. Concrete Slabs: Finish to requirements of ACI 302.1R.
5. CURING AND PROTECTION
 - A. Comply with requirements of ACI 308R. 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. Surfaces not in contact with forms:
 1. 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 ponding, water-saturated sand, water-fog spray, or saturated burlap.
 - a. Ponding: Maintain 100 percent coverage of water over floor slab areas, continuously for 4 days.
 - b. Spraying: Spray water over floor slab areas and maintain wet.
 - c. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
 2. Final curing: Begin after initial curing but before surface is dry.
 - a. Moisture-Retaining Cover: Seal in place with waterproof tape or adhesive.
 - D. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.
6. FIELD QUALITY CONTROL
 - A. Submit proposed mix designs for review prior to commencement of concrete operations.
 - B. Compressive Strength Tests: ASTM C 39. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 50-cu yd or less of each class of concrete placed.
 - C. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
 - D. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C 143.
7. DEFECTIVE CONCRETE
 - A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
 - B. 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.
 - C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of architect for each individual area.

END OF SECTION

Cold-Formed Metal Framing

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Formed steel stud exterior wall and interior wall framing.
2. RELATED REQUIREMENTS
 - A. Section 09.2116 - Gypsum Board Assemblies: Lightweight, non-load bearing metal stud framing.
 - B. Section 09.5100 - Acoustical Ceilings: Ceiling suspension system.
3. ADMINISTRATIVE REQUIREMENTS
 - A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.
4. SUBMITTALS
 - A. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations and _____.
 - B. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
 - C. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
 1. Indicate stud and ceiling joist layout.
 2. Describe method for securing studs to tracks and for bolted framing connections.
 3. Provide design engineer's stamp on shop drawings.
 4. Provide calculations for loadings and stresses of specially fabricated framing, stamped by a Professional Structural Engineer.
 5. Provide details and calculations for factory-made framing connectors, stamped by a Professional Structural Engineer.
5. QUALITY ASSURANCE
 - A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.
 - B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum three years of documented experience.
 - C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

PART 2 PRODUCTS

1. MANUFACTURERS
 - A. Metal Framing:
 1. Marino; ____: www.marinoware.com/#sle.
 2. Substitutions: See Section 01.6000 - Product Requirements.
 - B. Framing Connectors and Accessories:
 1. Same manufacturer as metal framing.
 2. Substitutions: See Section 01.6000 - Product Requirements.
2. FRAMING MATERIALS
 - A. Studs and Track: ASTM C955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
3. FASTENERS
 - A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.
 1. Products:

- a. ITW Commercial Construction North America; ITW CCNA-Buildex Tek's Select Series; _____:
www.ITWBuildex.com/#sle.

4. ACCESSORIES

- A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.
- B. Plates, Gussets, Clips: Formed Sheet Steel, thickness determined for conditions encountered; finish to match framing components.

PART 3 EXECUTION

1. EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify field measurements and adjust installation as required.

2. INSTALLATION OF STUDS

- A. Install components in accordance with ASTM C1007 requirements and ASTM C1007 requirements.
- B. Place studs at 12 inches (300 mm) on center; not more than 2 inches (50 mm) from abutting walls and at each side of openings. Connect studs to tracks using clip and tie method.
- C. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.

END OF SECTION

Decorative Metal Railings

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Railing systems.
2. REFERENCE STANDARDS
 - A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.
 - B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
 - C. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.
 - D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
 - E. SSPC-SP 1 - Solvent Cleaning; 2015.
 - F. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013.
 - G. NAAMM AMP 500-06 - Metal Finishes Manual; 2006.
3. ADMINISTRATIVE REQUIREMENTS
 - A. Preinstallation Meeting: Convene preinstallation meeting one week before starting work of this section. Attendees include:
 1. Contractor.
 2. Manufacturer's representative.
 3. Architect.
 4. Owner's representative.
 5. Other subcontractors of adjacent work.
4. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements for submittal procedures.
 - B. Product Data: Submit manufacturer's product data, including description of materials, components, finishes, fabrication details, glass, anchors, and accessories.
 - C. Shop Drawings: Indicate railing system elevations and sections, details of profile, dimensions, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Indicate anchor and joint locations, brazed connections, transitions, and terminations.
 - D. Test Reports: Submit test reports from independent testing agency showing compliance with specified design and performance requirements.
 - E. Manufacturer's Instructions: Indicate installation.
 - F. Designer's qualification statement.
 - G. Executed warranty.
5. QUALITY ASSURANCE
 - A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located or personnel under direct supervision of engineer.
 - B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.
 - C. Installer Qualifications:
 1. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
6. DELIVERY, STORAGE, AND HANDLING
 - A. Deliver materials in factory-provided protective coverings and packaging.

- B. Protect materials against damage during transit, delivery, storage, and installation at site.
 - C. Inspect materials upon delivery for damage. Replace damaged items.
 - D. Prior to installation, store materials and components under cover in dry location.
7. FIELD CONDITIONS
- A. Ambient Conditions:
 - 1. Do not install railings until project is enclosed and ambient temperature of space is minimum 65 degrees F (18.3 degrees C) and maximum 95 degrees F (35 degrees C).
 - 2. Maintain ambient temperature of space at minimum 65 degrees F (18.3 degrees C) and maximum 95 degrees F (35 degrees C) for 24 hours before, during, and after railing installation.
8. WARRANTY
- A. Manufacturer's Warranty: Manufacturer's standard 1-year warranty against defects in materials, fabrication, finishes, and installation commencing on mm-dd-yyyy; complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

1. MANUFACTURERS
- A. Decorative Metal Railings: As indicated on Drawings.
 - 1. Superior Aluminum Products, Inc; Series 9P: www.superioraluminum.com/#sle.
 - 2. Viva Railings, LLC; _____: www.vivarailings.com/#sle.
 - 3. Substitutions: See Section 01.6000 - Product Requirements.
2. RAILING SYSTEMS
- A. General: Factory- or shop-fabricated to suit project conditions, for proper connection to building structure, and in largest sizes practical for delivery to site.
 - B. Performance Requirements: Applying loads simultaneously not required; design and fabricate railings and anchorages to resist loads without failure, damage, or permanent set, including:
 - 1. Lateral Force: 75 lb (333 N) minimum, when tested in accordance with ASTM E935.
 - 2. Distributed Load: 50 lbf/ft (8756 N/m) minimum, applied vertically and horizontally at top of handrail, when tested in accordance with ASTM E935.
 - 3. Concentrated Loads: 200 lb (888 N) minimum, applied to handrail horizontally and vertically, in accordance with ASTM E935.
 - C. Assembly: Use slip-on, nonweld mechanical fittings, flanges, escutcheons, and wall brackets to join lengths, seal open ends, and conceal exposed mounting bolts and nuts.
 - D. Joints: Machined smooth with hairline seams; tightly fitted and secured.
 - E. Field Connections: Provide sleeves to accommodate site assembly and installation.
3. ACCESSORIES
- A. Anchors and Fasteners: Provide anchors, fasteners, and other attachment devices required to attach to structure. Ensure attachment devices are of same material as components unless indicated otherwise.

PART 3 EXECUTION

1. EXAMINATION
- A. Verify that substrate and site conditions are acceptable and ready to receive work.
 - B. Verify field dimensions of locations and areas to receive work.
 - C. Notify Architect immediately of conditions that would prevent satisfactory installation.
 - D. Do not proceed with work until detrimental conditions are corrected.
2. PREPARATION
- A. Review installation drawings before beginning installation. Coordinate diagrams, templates, instructions, and directions for installation of anchorages and fasteners.

- B. Clean surfaces to receive railings. Remove materials and substances detrimental to installation.
3. INSTALLATION
- A. Install in accordance with manufacturer's instructions.
 - B. Install components plumb and level, accurately fitted, free from distortion or defects, and with tight joints, except where necessary for expansion.
 - C. Anchor securely to structure.
 - D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
 - E. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.
4. TOLERANCES
- A. Maximum Variation From Plumb: 1/4 inch (6 mm) per floor level, noncumulative.
 - B. Maximum Offset From True Alignment: 1/4 inch (6 mm).
 - C. Maximum Out-of-Position: 1/4 inch (6 mm).
5. FIELD QUALITY CONTROL
- A. See Section 01.4000 - Quality Requirements for additional requirements.
 - B. Manufacturer Services: Provide services of manufacturer's field representative to observe railing installation.
6. CLEANING
- A. Remove protective film from exposed metal surfaces.
 - B. Metal: Clean exposed metal finishes with potable water and mild detergent in accordance with manufacturer recommendations; do not use abrasive materials or chemicals, detergents, or other substances that may damage material or finish.
7. PROTECTION
- A. Protect installed components and finishes from damage after installation.
 - B. Repair damage to exposed, making finishes indistinguishable from undamaged areas.
 - C. Replace finishes and components that have irreparable damage. Ensure damaged areas are indistinguishable from undamaged finishes and surfaces.

END OF SECTION

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Preservative treated wood materials.
 - B. Concealed wood blocking, nailers, and supports.
 - C. Miscellaneous wood nailers, furring, and grounds.
2. RELATED REQUIREMENTS
 - A. Section 07.6200 - Sheet Metal Flashing and Trim: Sill flashings.
3. REFERENCE STANDARDS
 - A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
 - B. AWWA U1 - Use Category System: User Specification for Treated Wood; 2012.
 - C. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; 2010.
 - D. PS 20 - American Softwood Lumber Standard; 2010.
4. 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, 12by12 inch (____by____ mm) in size illustrating wood grain, color, and general appearance.
5. 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, or installation.
 - C. For lumber and plywood pressure treated with waterborne chemicals, sticker between each course to provide air circulation.
6. WARRANTY
 - A. See Section 01.7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

1. GENERAL REQUIREMENTS
 - A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
 2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
 3. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.
 - B. Lumber fabricated from old growth timber is not permitted.
 - C. Provide wood for support or attachment of other work including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping and similar members. Provide lumber of sizes indicated, worked into shapes shown, as follows:
 1. Moisture Content: 19% maximum for lumber items not specified to receive wood preservative treatment.
 2. Grade: No. 2 common Southern per SPIB rules.

2. DIMENSION LUMBER
 - A. Sizes: Nominal sizes as indicated on drawings, _____.
 - B. For framing lumber, use No. 2 kiln dried Southern Yellow Pine.
 - C. Moisture Content: S-dry or MC19.
 - D. Provide lumber with 15% maximum moisture content at time of dressing and shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.
 - E. Stud Framing (2 by 2 through 2 by 6 (50 by 50 mm through 50 by 150 mm)):
 1. Species: Southern Pine.
 2. Grade: No. 2.
 - F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 1. Lumber: S4S, No. 2 or Standard Grade.
 2. Boards: Standard or No. 3.
3. CONSTRUCTION PANELS
 - A. Subfloor/Underlayment Combination: Any PS 2 type, rated Single Floor.
 1. Bond Classification: Exterior.
 2. Span Rating: 48.
 3. Performance Category: 1-1/8 PERF CAT.
4. ACCESSORIES
 - A. Fasteners and Anchorage: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended nails.
 - B. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
 - C. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions.
 - D. Sill Flashing: As specified in Section 07.6200.
 - E. Subfloor Adhesives: Waterproof, air cure type, cartridge dispensed.
5. 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. 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. Preservative Treatment:
 1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
 - a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
 - b. Treat lumber exposed to weather.
 - c. Treat lumber in contact with roofing, flashing, or waterproofing.
 - d. Treat lumber in contact with masonry or concrete.
 - e. Treat lumber less than 18 inches (450 mm) above grade.
 2. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.
 - a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
 - b. Treat plywood in contact with roofing, flashing, or waterproofing.
 - c. Treat plywood in contact with masonry or concrete.

- d. Treat plywood less than 18 inches (450 mm) above grade.
- 3. Preservative Pressure Treatment of Lumber in Contact with Soil: AWPA U1, Use Category UC4A, Commodity Specification A using waterborne preservative.
 - a. Preservative for Field Application to Cut Surfaces: As recommended by manufacturer of factory treatment chemicals for brush-application in the field.

PART 3 EXECUTION

- 1. PREPARATION
 - A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches (100 mm) and seal.
 - B. Coordinate installation of rough carpentry members specified in other sections.
- 2. INSTALLATION - GENERAL
 - A. Select material sizes to minimize waste.
 - B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
 - C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.
- 3. BLOCKING, NAILERS, AND SUPPORTS
 - A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
 - B. In 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 code authorities may be used in lieu of solid wood blocking.
 - C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
 - D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
 - E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- 4. INSTALLATION OF CONSTRUCTION PANELS
 - A. Subflooring/Underlayment Combination: Glue and nail to framing; staples are not permitted.
 - B. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
 - 1. At long edges provide solid edge blocking where joints occur between roof framing members.
 - 2. Nail panels to framing; staples are not permitted.
- 5. TOLERANCES
 - A. Framing Members: 1/4 inch (6 mm) from true position, maximum.
 - B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet (2 mm/m) maximum, and 1/4 inch in 30 feet (7 mm in 10 m) maximum.
- 6. FIELD QUALITY CONTROL
 - A. See Section 01.4000 - Quality Requirements, for additional requirements.
- 7. CLEANING
 - A. Waste Disposal: Comply with the requirements of Section 01.7419 - Construction Waste Management and Disposal.
 - 1. Comply with applicable regulations.

2. Do not burn scrap on project site.
 3. Do not burn scraps that have been pressure treated.
 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.
- B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

Architectural Wood Casework

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Specially fabricated cabinet units.
 - B. Countertops.
 - C. Cabinet hardware.
 - D. Factory finishing.
 - E. Preparation for installing utilities.
2. RELATED REQUIREMENTS
 - A. Appendix A - UMMC Finish Standards
3. REFERENCE STANDARDS
 - A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
 - B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.
4. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 1. Scale of Drawings: 1-1/2 inch to 1 foot (125 mm to 1 m), minimum.
 2. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
 - C. Product Data: Provide data for hardware accessories.
 - D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches (300 mm) square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.
5. QUALITY ASSURANCE
 - A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
6. DELIVERY, STORAGE, AND HANDLING
 - A. Protect units from moisture damage.
7. FIELD CONDITIONS
 - A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

1. CABINETS
 - A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
 - B. Plastic Laminate Faced Cabinets: Custom grade.
2. LAMINATE MATERIALS
 - A. Manufacturers:
 1. See Appendix A - UMMC Finish Standards for manufacturer.
 2. Substitutions: See Section 01.6000 - Product Requirements.
 - a. Substitutions shall be reviewed and approved by UMMC Office of Planning, Design & Construction.
3. COUNTERTOPS
 - A. See Drawings for types and extents. See Appendix A - UMMC Finish Standards for manufacturer.
4. ACCESSORIES
 - A. Adhesive: Type recommended by fabricator to suit application.

- B. Fasteners: Size and type to suit application.
 - C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
 - D. Concealed Joint Fasteners: Threaded steel.
 - E. Grommets: Standard painted metal grommets for cut-outs, in color to match adjacent surface.
5. HARDWARE
- A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.
 - B. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch (25 mm) spacing adjustments.
 - C. Drawer and Door Pulls: "U" shaped wire pull, steel with chrome finish, 4 inch centers ("U" shaped wire pull, steel with chrome finish, 100 mm centers).
 - D. Drawer Slides:
 - 1. Type: Extension types as indicated.
 - 2. Static Load Capacity: Commercial grade.
 - 3. Mounting: Side mounted.
 - 4. Stops: Integral type.
 - E. Hinges: European style concealed self-closing type, steel with polished finish.
6. FABRICATION
- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
 - B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
 - C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
 - D. Plastic Laminate: 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. (Locate counter butt joints minimum 600 mm from sink cut-outs.)

PART 3 EXECUTION

1. EXAMINATION
- A. Verify adequacy of backing and support framing.
 - B. Verify location and sizes of utility rough-in associated with work of this section.
2. INSTALLATION
- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
 - B. Use fixture attachments in concealed locations for wall mounted components.
 - C. Use concealed joint fasteners to align and secure adjoining cabinet units.
 - D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim for this purpose.
 - E. Secure cabinets to floor using appropriate angles and anchorages.
3. ADJUSTING
- A. Adjust installed work.
 - B. Adjust moving or operating parts to function smoothly and correctly.

4. CLEANING

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

Fiberglass Reinforced Paneling

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Fiberglass reinforced plastic panels.
 - B. Trim.
2. REFERENCE STANDARDS
 - A. 9 CFR 416.2 - Regulatory Requirements Under the Federal Meat Inspection Act and the Poultry Products Inspection Act, Part 416-Sanitation; current edition.
 - B. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2010.
 - C. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
 - D. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2012.
 - E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
 - F. FM 4880 - Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings and Exterior Wall Systems; 2010.
 - G. ISO 846 - Plastics - Evaluation of the Action of Microorganisms; 1997.
 - H. ISO 2812-1 - Paints and Varnishes - Determination of resistance to liquids - Part 1: Immersion in liquids; 2007.
3. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
 - C. Samples: Submit two samples 12 by 12 inch (305 x 305 mm) in size illustrating material and surface design of panels.
 - D. 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 Panels: Quantity equal to 5 percent of total installed.
4. DELIVERY, STORAGE, AND HANDLING
 - A. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

PART 2 PRODUCTS

1. MANUFACTURERS
 - A. Fiberglass Reinforced Plastic Panels:
 1. Crane Composites, Inc: www.cranecomposites.com.
 2. Marlite, Inc: www.marlite.com.
 3. Nudo Products, Inc: www.nudo.com.
 4. Panolam Industries International, Inc; Panolam FRP: www.panolam.com.
 5. Substitutions: See Section 01 6000 - Product Requirements.
2. PANEL SYSTEMS
 - A. Wall Panels:
 1. Panel Size: 4 by 8 feet (1.2 by 2.4 m).
 2. Panel Thickness: 0.10 inch (2.5 mm).
 3. Surface Design: Embossed.
 4. Color: White.

5. Attachment Method: Adhesive only, sealant joints, no trim.

3. MATERIALS

- A. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
 1. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.
 2. Class 1 fire rated when tested in accordance with FM 4880.
 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 4. Scratch Resistance: Barcol hardness score greater than 35, when tested in accordance with ASTM D2583.
 5. Impact Strength: Greater than 6 ft lb force per inch (320 J per m), when tested in accordance with ASTM D256.
 6. Sanitation and Cleanability: Comply with 9 CFR 416.2.
 7. Chemical Cleanability: Excellent chemical resistance to common cleaners and detergents when tested in accordance with ISO 2812-1.
- B. Trim: Vinyl; color coordinating with panel.
- C. Fasteners: Nylon rivets.
- D. Adhesive: Type recommended by panel manufacturer.
- E. Sealant: Type recommended by panel manufacturer; white.

PART 3 EXECUTION

1. EXAMINATION

- A. Verify existing conditions and substrate flatness before starting work.
- B. Verify that substrate conditions are ready to receive the work of this section.

2. INSTALLATION - WALLS

- A. Install panels in accordance with manufacturer's instructions.
- B. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.
- C. Pre-drill fastener holes in panels, 1/8 inch (3.2 mm) greater in diameter than fastener, spaced as indicated by panel manufacturer.
- D. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.
- E. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.
- F. Install panels with manufacturer's recommended gap for panel field and corner joints.
- G. Drive fasteners to provide snug fit, and do not over-tighten.
- H. Place trim on panel before fastening edges, as required.
- I. Fill channels in trim with sealant before attaching to panel.
- J. Install trim with adhesive and screws or nails, as required.
- K. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.
- L. Remove excess sealant after paneling is installed and prior to curing.

END OF SECTION

Sheet Waterproofing

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Sheet Waterproofing:
2. RELATED REQUIREMENTS
 - A. Section 03.3000 - Cast-in-Place Concrete: Concrete substrate.
 - B. Section 06.110 - Rough Carpentry
 - C. Section 07.2100 - Thermal Insulation: Insulation used for protective cover.
 - D. Section 07.6200 - Sheet Metal Flashing and Trim: Metal parapet, coping, and counterflashing.
 - E. Section 07.9200 - Joint Sealants: Sealing moving joints in waterproofed surfaces that are not required to be treated in this section.
 - F. Section 22.1006 - Plumbing Piping Specialties: Roof drain and plumbing vent flashing flanges.
3. SUBMITTALS
 - A. Product Data: Provide data for all components of the waterproofing systems specified herein.
 - B. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
 - C. Certificate: Certify that products meet or exceed specified requirements.
 - D. Manufacturer's Installation Instructions: Indicate special procedures.
 - E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
4. QUALITY ASSURANCE
 - A. Membrane Manufacturer Qualifications: Company specializing in waterproofing sheet membranes with 20 years experience.
 - B. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years experience.
5. MOCK-UP
 - A. Construct mock-up 100 sq ft (10 sq m) of horizontal and vertical waterproofed panel; to represent finished work including internal and external corners.
 - B. Locate where directed.
 - C. Mock-up may remain as part of this Work.
6. WARRANTY

PART 2 PRODUCTS

1. WATERPROOFING APPLICATIONS
 - A. Waterproofing No. 1 (WP#1) - Self Adhered Sheet Membrane for use as Roofing Underlayment and at Miscellaneous Locations as shown in the Drawings
 - B. Waterproofing No. 2 - (WP#2) - Sheet Membrane Waterproofing System for use at Exterior Below Grade Foundation Walls
 - C. Waterproofing No. 3 - (WP #3)(Thru-Wall Flashing) - Self Adhered Sheet Membrane for all Thru Wall Flashing Applications
2. ACCESSORIES
 - A. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and waterproofing materials.
 - B. Drainage Panel: Drainage layer with geotextile filter fabric on earth side.
 - C. Cant Strips: Premolded composition material.
 - D. Flexible Flashings: Type recommended by membrane manufacturer.

PART 3 EXECUTION

1. EXAMINATION

- A. Verify existing conditions are acceptable prior to starting this work.
- B. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.
- C. Verify items that penetrate surfaces to receive waterproofing are securely installed.

2. PREPARATION

- A. Protect adjacent surfaces from damage not designated to receive waterproofing.
- B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions; vacuum substrate clean.
- C. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.
- D. Fill non-moving joints and cracks with a filler compatible with waterproofing materials.
- E. Seal moving cracks with sealant and non-rigid filler, using procedures recommended by sealant and waterproofing manufacturers.
- F. Prepare building expansion joints at locations as indicated on drawings.
- G. Surfaces for Adhesive Bonding: Apply surface conditioner at a rate recommended by manufacturer, and protect conditioner from rain or frost until dry.
- H. Concrete Surfaces for Adhesive Bonding: Prepare concrete substrate according to ASTM D5295/D5295M.

3. INSTALLATION - WP #2 - BELOW GRADE WATERPROOFING SYSTEM FOR FOUNDATION WALLS

- A. Refer to manufacturer's literature for recommendations on installation, including but not limited to, the following:
 - 1. Apply surface conditioner at rate recommended by manufacturer. Recoat areas not waterproofed if contaminated by dust. Mask and protect adjoining exposed finish surfaces to protect those surfaces from excessive application of surface conditioner.
 - 2. Delay application of membrane until surface conditioner is completely dry. Dry time will vary with weather conditions.
 - 3. Seal daily terminations with troweled bead of mastic.
 - 4. Apply drainage mat and related materials in accordance with manufacturer's recommendations.

4. INSTALLATION - WP #3 - THRU-WALL FLASHING

- A. General: Install flashing to dry surfaces at air and surface temperatures of -4°C (25°F) and above in accordance with manufacturer's recommendations at locations indicated on Construction Documents.
- B. Flexible Wall Flashing:
 - 1. Precut pieces of flashing to easily handled lengths for each location.
 - 2. Remove silicone-coated release paper and position flashing carefully before placing it against the surface.
 - 3. When properly positioned, place against surface by pressing firmly into place by hand roller. Fully adhere flashing to substrate to prevent water from migrating under flashing.
 - 4. Overlap adjacent pieces 50 mm (2 in.) and roll all seams with a steel hand roller.
 - 5. Trim bottom edge 13 mm (1/2 in.) back from exposed face of the wall. Flashing shall not be permanently exposed to sunlight.
 - 6. At heads, sills and all flashing terminations turn up ends a minimum of 50 mm (2 in.) and make careful folds to form an end dam, with the seams sealed.
 - 7. Do not allow the rubberized asphalt surface of the flashing membrane to come in contact with polysulfide sealants, creosote, uncured coal tar products or EPDM.

8. Do not expose flashing membrane to sunlight for more than thirty days prior to enclosure.
- C. Accessories:
1. When required by dirty or dusty site conditions or by surfaces having irregular or rough texture, apply manufacturer approved primer by air spray, brush or roller at the rate recommended by manufacturer, prior to flashing installation. Allow the primer to dry completely before flashing application.
 2. Apply termination bar and a bead or trowel coat of mastic along flashing top edge, seams, cuts, and penetrations.
5. **INSTALLATION**
6. **INSTALLATION - DRAINAGE PANEL AND PROTECTION BOARD**
- A. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward. Scribe and cut boards around projections, penetrations, and interruptions.
7. **PROTECTION**
- A. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION

Fluid-Applied Waterproofing

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Fluid-Applied Waterproofing:
 1. Hot-applied rubberized asphalt waterproofing.
 2. Cold-applied rubberized asphalt/HDPE composite waterproofing.
2. RELATED REQUIREMENTS
 - A. Section 03.3000 - Cast-in-Place Concrete: Concrete substrate.
 - B. Section 04.2000 - Unit Masonry: Masonry joints prepared to receive flashings.
 - C. Section 07.2100 - Thermal Insulation: Insulation used for protective cover.
 - D. Section 07.6200 - Sheet Metal Flashing and Trim: Metal parapet covers, copings, and counterflashings.
 - E. Section 07.9200 - Joint Sealants: Sealing moving joints in waterproofed surfaces that are not part of work in this section.
3. REFERENCE STANDARDS
 - A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
 - B. ASTM C1306/C1306M - Standard Test Method for Hydrostatic Pressure Resistance of a Liquid-Applied Waterproofing Membrane; 2008, with Editorial Revision (2016).
 - C. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
 - D. ASTM D5385/D5385M - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes; 1993 (Reapproved 2014).
 - E. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
 - F. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a (Reapproved 2013).
 - G. ICC-ES AC29 - Acceptance Criteria for Cold, Liquid-Applied, Below-Grade, Exterior Dampproofing and Waterproofing Materials; 2011.
 - H. NRCA (WM) - The NRCA Waterproofing Manual; 2005.
4. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data for membrane, surface conditioner, flexible flashings, joint cover sheet, and joint and crack sealants.
 - C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
 - D. Certificate: Certify that products meet or exceed specified requirements.
 - E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.
 - F. Warranty:
 1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
 2. Submit installer's certification that installation complies with warranty conditions for the waterproofing membrane.
5. QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in manufacture of fluid-applied waterproofing membranes with 20 years experience.

- B. Installer Qualifications: Company specializing in installation of fluid-applied waterproofing with minimum 5 years experience.
6. MOCK-UP
- A. Construct mock-up consisting of 100 sq ft (10 sq m) of horizontal waterproofed panel; to represent finished work including internal and external corners, drainage panel, base flashings, control joints, expansion joints, counterflashings, and protective cover.
 - B. See Section 01.4000 - Quality Requirements for additional requirements.
 - C. Locate where directed.
 - D. Mock-up may remain as part of this Work.
7. FIELD CONDITIONS
- A. Maintain ambient temperatures above 40 degrees F (5 degrees C) for 24 hours before and during application and until cured.
8. WARRANTY
- A. See Section 01.7800 - Closeout Submittals, for additional warranty requirements.
 - B. Contractor shall correct defective Work within a five year period after Date of Substantial Completion; remove and replace materials concealing waterproofing at no cost to Owner.
 - C. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water, except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

PART 2 PRODUCTS

1. FLUID APPLIED WATERPROOFING MATERIALS
- A. Hot-Applied Rubberized Asphalt Waterproofing: Elasticized rubberized asphaltic compound, hot-applied and quick setting.
 - 1. Capable of resisting water head of _____ feet (_____ m) and preventing moisture migration to interior, tested in accordance with ASTM D5385/D5385M.
 - 2. Suitable for installation over concrete, gypsum board, and plywood substrates.
 - 3. Ultimate Elongation: 500 percent, minimum, measured in accordance with ASTM D412.
 - 4. Water Vapor Permeance: 0.016 perms (0.9 ng/(Pa s sq m)), maximum, measured in accordance with ASTM E96/E96M.
 - 5. Reinforcing: Continuous; manufacturer's standard reinforcing fabric, approved for use with specified product.
 - 6. Finished Coating Thickness: 215 mils, 0.215 inch (5.5 mm), minimum.
 - 7. Manufacturers:
 - a. Carlisle Coatings & Waterproofing, Inc; CCW 500: www.carlisleccw.com/#sle.
 - b. Tremco Commercial Sealants & Waterproofing; TREMproof 6100: www.tremcosealants.com/#sle.
 - c. W.R. Meadows, Inc; HRM 714: www.wrmeadows.com/#sle.
 - d. Substitutions: See Section 01.6000 - Product Requirements.
 - B. Cold-Applied Rubberized Asphalt/HDPE Composite Waterproofing: Water-based, capable of being applied to green concrete; spray-applied polymer modified asphalt membrane with HDPE core and drainage composite.
 - 1. Capable of resisting water head of _____ feet (_____ m) and preventing moisture migration to interior.
 - 2. Film Thickness: 157 mils, 0.157 inch (4.0 mm), minimum.
 - 3. Tensile Strength: 662 psi (4.6 mPa), minimum, when tested in accordance with ASTM D412.

4. Ultimate Elongation: 4,140 percent, minimum, when tested in accordance with ASTM D412.
 5. Water Vapor Permeance: 0.21 perm (12 ng/(Pa s sq m)), maximum, when tested in accordance with ASTM E96/E96M.
 6. Resistance to decay: 4 percent permanent loss, maximum, when tested in accordance with ASTM E154/E154M, Section 13.
 7. Manufacturers
 - a. Epro Waterproofing Systems; System III Plus: www.eproserv.com/#sle.
 - b. Substitutions: See Section 01.6000 - Product Requirements.
2. ACCESSORIES
- A. Surface Conditioner: compatible with membrane compound; as recommended by membrane manufacturer.
 - B. Sealant for Joints and Cracks in Substrate: Type compatible with waterproofing material and as recommended by waterproofing manufacturer.
 - C. Protection Board: Rigid insulation specified in Section 07.2100.
 - D. Drainage Panel: 1/4 inch (6 mm) thick formed plastic, hollowed sandwich.

PART 3 EXECUTION

1. EXAMINATION
 - A. Verify existing conditions before starting work.
 - B. Verify substrate surfaces are free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of waterproofing system.
 - C. Verify that substrate surfaces are smooth, free of honeycomb or pitting, and not detrimental to full contact bond of waterproofing materials.
 - D. Verify items that penetrate surfaces to receive waterproofing are securely installed.
2. PREPARATION
 - A. Protect adjacent surfaces from damage not designated to receive waterproofing.
 - B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions; vacuum substrate clean.
 - C. Do not apply waterproofing to surfaces unacceptable to waterproofing manufacturer.
 - D. Fill non-moving joints and cracks with a filler compatible with waterproofing materials.
 - E. Seal moving cracks with sealant and non-rigid filler, using procedures recommended by sealant and waterproofing manufacturers.
 - F. Prepare building expansion joints at locations as indicated on drawings.
 - G. Install cant strips at inside corners.
3. INSTALLATION
 - A. Install waterproofing to specified minimum thickness in accordance with manufacturers instructions and NRCA (WM) applicable requirements.
 - B. Apply primer or surface conditioner at a rate recommended by manufacturer, and protect conditioner from rain or frost until dry.
 - C. Extend membrane over cants and up intersecting surfaces at membrane perimeter minimum 6 inches (150 mm) above horizontal surface for first ply and ____ inches (____ mm) at subsequent plies laid in shingle fashion.
 - D. Apply extra thickness of waterproofing material at corners, intersections, and angles.
 - E. Seal membrane and flashings to adjoining surfaces.

4. INSTALLATION - DRAINAGE PANEL AND PROTECTION BOARD
 - A. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward, and scribe and cut boards around projections, penetrations, and interruptions.
 - B. Adhere protection board to substrate with compatible adhesive.
5. PROTECTION
 - A. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION

Thermal Insulation**PART 1 GENERAL**

1. SECTION INCLUDES
 - A. Board insulation at cavity wall construction, underside of floor slabs, and exterior wall behind _____ wall finish.
 - B. Batt insulation and vapor retarder in exterior wall and ceiling construction.
 - C. Sound Attenuation batt insulation for installation within interior wall cavities and above ceilings for acoustical purposes.
2. RELATED REQUIREMENTS
 - A. Section 03.3000 - Cast-in-Place Concrete
 - B. Section 04.2000 - Unit Masonry
 - C. Section 05.4000 - Cold-Formed Metal Framing
 - D. Section 06.1000 - Rough Carpentry
 - E. Section 07.2119 - Foamed-In-Place Insulation
 - F. Section 07.2400 - Exterior Insulation and Finish Systems:
 - G. Section 07.2500 - Weather Barriers
 - H. Section 07.5200 - Modified Bituminous Membrane Roofing: Insulation specified as part of roofing system.
 - I. Section 07.8400 - Firestopping: Insulation as part of fire-rated through-penetration assemblies.
 - J. Section 09.2116 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.
3. REFERENCE STANDARDS
 - A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
 - B. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
 - C. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
 - D. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.
 - E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
 - F. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
 - G. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.
 - H. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies; 2011.
 - I. FM DS 1-28 - Wind Design; 2007.
 - J. ICC-ES AC239 - Acceptance Criteria for Termite-Resistant Foam Plastic; 2008.
 - K. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2023.
4. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
 - C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
 - D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
5. QUALITY ASSURANCE
 - A. Do not allow insulation materials to become wet, soiled or covered with ice or snow.

- B. Comply with manufacturers' recommendations for handling, storage and protection during installation.
6. FIELD CONDITIONS
- A. Do not install insulation or insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

1. MANUFACTURERS

- A. Insulation: See individual installation types for specific basis of design manufacturers.
 - 1. Substitutions: See Section 01.6000 - Product Requirements.

2. APPLICATIONS

- A. Insulation in Metal Framed Walls: Batt insulation with no vapor retarder.

3. BATT INSULATION MATERIALS

- A. Unfaced Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
 - 1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 - 2. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
 - 3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, ____.
 - 4. Thermal Resistance: R-value (RSI-value) of __ (____). 21 for 5 1/2" thickness, 15 for 3 1/2" thickness
 - 5. Thickness: Varies depending on stud size, batt insulation to fill stud cavity depth typical.
 - 6. Manufacturers:
 - a. Owens Corning Corporation; EcoTouch PINK FIBERGLAS Insulation: www.ocbuildingspec.com/#sle.
 - b. or approved equal.
 - 7. Substitutions: See Section 01.6000 - Product Requirements.
- B. Unfaced Interior Wall Sound Attenuation Batt Insulation:
 - 1. ASTM C665, Type I
 - 2. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84
 - 3. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84
 - 4. Thickness: as indicated on the drawings. Varies depending on stud size, batt insulation to fill stud cavity depth typical.
 - 5. Width: unless otherwise noted provide same as framing spacing indicated.
 - 6. Manufacturers:
 - a. Johns Manville; Unfaced Formaldehyde-Free Thermal and Acoustical Fiberglass Insulation
 - b. Owens Corning; Sound Attenuation Batts
 - c. CertainTeed; Noise Reducer Sound Attenuation Batts
 - d. or approved equal
 - 7. Substitutions: See Section 01.6000 - Product Requirements

4. ACCESSORIES

- A. Tape: Reinforced polyethylene film with acrylic pressure sensitive adhesive.
- B. Flashing Tape: Special reinforced film with high performance adhesive.
 - 1. Application: Window and door opening flashing tape.
 - 2. Width: As required for application.
- C. Tape joints of rigid insulation in accordance with roofing and insulation manufacturers' instructions.
- D. Protection Board for Below Grade Insulation: Cementitious, 1/4 inch (6 mm) thick.

- E. Adhesive: In locations where necessary, use Type recommended by insulation manufacturer for application.
- F. Low Expansion Foam: provide Green Series Pro-Foam II as manufactured by OSI (www.osipro.com)

PART 3 EXECUTION

1. 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.
2. **BOARD INSTALLATION AT BELOW GRADE EXTERIOR WALLS**
 - A. Adhere 6 inches (152 mm) wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.
 1. Extend sheet full height of joint.
 - B. Apply ___ adhesive to back of boards or press firmly into tacky waterproofing according to manufacturers recommended instructions.
 - C. Install boards horizontally on walls.
 - D. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
3. BOARD INSTALLATION AT CAVITY WALLS
 - A. Material shall be installed according to their manufacturer's instructions in all cavity wall construction.
 - B. Adhere a 6 inches (152 mm) wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.
 1. Extend sheet full height of joint.
 - C. Apply pads of adhesive to back of boards:
 1. 24 inches on center both ways or as recommended by the manufacturer.
 - D. Install boards to fit snugly between wall ties.
 1. Place membrane surface facing out, and tape seal board joints.
 - E. Install boards horizontally on walls.
 - F. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
4. BOARD INSTALLATION UNDER CONCRETE SLABS
 - A. Place insulation under slabs on grade after base for slab has been compacted.
 - B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
 - C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.
5. BATT INSTALLATION
 - A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
 - B. Install in exterior wall and ceiling spaces without gaps or voids. Do not compress insulation.
 - C. Fill all cracks around doors and windows with low expansion spray foam insulation.
 - D. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
 - E. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
 - F. Place insulation around pipes to prevent freezing and fit neatly around and behind electrical boxes. Leave no gaps.
6. SOUND ATTENUATION BATTS
 - A. Interior Walls
 1. Position to fit snugly between studs
 2. Install Batts at all cracks around doors

3. Staple unfaced insulation to gypsum board with at least five 9/16 inch long staples driven through 1-1/2" inch long pieces of gypsum board joint reinforcement placed on face of insulation to hold insulation in place, or use proprietary fastening system manufactured for this purpose.
 4. In areas where it will be applied in heights over 8 feet, use wire, metal straps, or other proprietary fastening to hold the product in place until the interior finish is applied.
- B. Interior Ceilings
1. Lay on top of ceiling panel and suspension system. Fit tightly together. Do not install on top or within 3 inches of recessed light fixtures unless the fixtures are approved for such use.
7. PROTECTION
- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

Exterior Insulation and Finish Systems

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Composite wall and soffit cladding of rigid insulation and reinforced finish coating, Class PB.
 - B. Drainage and water-resistive barriers behind insulation board.
 - C. Incidental uses of same finish coating applied directly to concrete and masonry.
2. RELATED REQUIREMENTS
 - A. Section 05.4000 - Cold-Formed Metal Framing: Sheathing on metal studs.
 - B. Section 06.1000 - Rough Carpentry: Sheathing on wood framing.
 - C. Section 07.6200 - Sheet Metal Flashing and Trim: Perimeter flashings.
 - D. Section 07.9200 - Joint Sealants: Sealing joints between EIFS and adjacent construction and penetrations through EIFS.
3. REFERENCE STANDARDS
 - A. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2019.
 - B. ASTM C297/C297M - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions; 2016.
 - C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
 - D. ASTM C1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster; 2023.
 - E. ASTM C1397 - Standard Practice for Application of Class PB Exterior Insulation and Finish Systems (EIFS) and EIFS with Drainage; 2013 (Reapproved 2019).
 - F. ASTM D968 - Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive; 2022.
 - G. ASTM D2247 - Standard Practice for Testing Water Resistance of Coatings in 100 % Relative Humidity; 2015 (Reapproved 2020).
 - H. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
 - I. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
 - J. ASTM E2273 - Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies; 2018.
 - K. ASTM G153 - Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials; 2013 (Reapproved 2021).
 - L. ASTM G155 - Standard Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials; 2021.
 - M. ICC-ES AC219 - Acceptance Criteria for Exterior Insulation and Finish Systems; 2009, with Editorial Revision (2022).
 - N. ICC-ES AC235 - Acceptance Criteria for EIFS Clad Drainage Wall Assemblies; 2015, with Editorial Revision (2022).
 - O. NFPA 259 - Standard Test Method for Potential Heat of Building Materials; 2023, with Errata.
 - P. NFPA 268 - Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source; 2022.
 - Q. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2023.
4. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements for submittal procedures.

- B. Product Data: Provide data on system materials, product characteristics, performance criteria, and system limitations.
 - C. Shop Drawings: Indicate wall and soffit joint patterns, joint details, and molding profiles.
 - D. Selection Samples: Submit manufacturer's standard range of samples illustrating available coating colors and textures.
 - E. Manufacturer's Installation Instructions: Indicate preparation required, installation techniques, and jointing requirements.
5. QUALITY ASSURANCE
- A. Maintain copy of specified installation standard and manufacturer's installation instructions at project site during installation.
 - B. EIFS Manufacturer Qualifications: Provide EIFS products other than insulation from the same manufacturer with qualifications as follows:
 - C. Insulation Manufacturer Qualifications: Approved by manufacturer of EIFS and approved and labeled under third party quality program as required by applicable building code.
 - D. Installer Qualifications: Company specializing in the type of work specified and with at least three years of documented experience.
6. DELIVERY, STORAGE, AND HANDLING
- A. Delivery: Deliver materials to project site in manufacturer's original, unopened containers with labels intact. Inspect materials and notify manufacturer of any discrepancies.
 - B. Storage: Store materials as directed by manufacturer's written instructions.
 - 1. Protect adhesives and finish materials from freezing, temperatures below 40 degrees F (4 degrees C) and temperatures in excess of 90 degrees F (32 degrees C).
 - 2. Protect Portland cement based materials from moisture and humidity. Store under cover off the ground in a dry location.
 - 3. Protect insulation materials from exposure to sunlight.
7. FIELD CONDITIONS
- A. Do not prepare materials or apply EIFS under conditions other than those described in the manufacturer's written instructions.
 - B. Do not prepare materials or apply EIFS during inclement weather unless areas of installation are protected. Protect installed EIFS areas from inclement weather until dry.
 - C. Do not install coatings or sealants when ambient temperature is below 40 degrees F (5 degrees C).
 - D. Do not leave installed insulation board exposed to sunlight for extended periods of time.
8. WARRANTY
- A. See Section 01.7800 - Closeout Submittals for additional warranty requirements.
 - B. Provide manufacturer's standard material warranty, covering a period of not less than 5 years.

PART 2 PRODUCTS

1. MANUFACTURERS
- A. Basis of Design:
 - 1. Dryvit Systems, Inc; Dryvit Outsulation Plus MD EIFS, Class PB with Moisture Drainage: www.dryvit.com/#sle.
 - B. Exterior Insulation and Finish Systems Manufacturers:
 - 1. Substitutions: See Section 01.6000 - Product Requirements.
2. EXTERIOR INSULATION AND FINISH SYSTEM
- A. Exterior Insulation and Finish System: DRAINAGE type; reinforced finish coating on flat-backed insulation board adhesive-applied directly to water-resistive coating over substrate; provide a complete

system that has been tested to show compliance with the following characteristics; include all components of specified system and substrate(s) in tested samples.

- B. Fire Characteristics:
 - 1. Flammability: Pass, when tested in accordance with NFPA 285.
 - 2. Ignitibility: No sustained flaming when tested in accordance with NFPA 268.
 - 3. Potential Heat of Foam Plastic Insulation Tested Independently of Assembly: No portion of the assembly having potential heat that exceeds that of the insulation sample tested for flammability (above), when tested in accordance with NFPA 259 with results expressed in Btu per square foot (mJ/sq m).
 - C. Adhesion of Water-Resistive Coating to Substrate: For each combination of coating and substrate, minimum flatwise tensile bond strength of 15 psi (105 kPa), when tested in accordance with ASTM C297/C297M.
 - D. Adhesion to Water-Resistive Coating: For each combination of insulation board and substrate, when tested in accordance with ASTM C297/C297M, maximum adhesive failure of 25 percent unless flatwise tensile bond strength exceeds 15 psi (105 kPa) in all samples.
 - E. Water Penetration Resistance: No water penetration beyond the plane of the base coat/insulation board interface after 15 minutes, when tested in accordance with ASTM E331 at 6.24 psf (299 Pa) differential pressure with tracer dye in the water spray; include in tested sample at least two vertical joints and one horizontal joint of same type to be used in construction; disassemble sample if necessary to determine extent of water penetration.
 - F. Drainage Efficiency: Average minimum efficiency of 90 percent, when tested in accordance with ASTM E2273 for 75 minutes.
 - G. Salt Spray Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating after 300 hours exposure in accordance with ASTM B117, using at least three samples matching intended assembly, at least 4 by 6 inches (100 by 150 mm) in size.
 - H. Freeze-Thaw Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating when viewed under 5x magnification after 10 cycles, when tested in accordance with ICC-ES AC219 or ICC-ES AC235.
 - I. Weathering Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating when viewed under 5x magnification after 2000 hours of accelerated weathering conducted in accordance with ASTM G153 Cycle 1 or ASTM G155 Cycles 1, 5, or 9.
 - J. Water Degradation Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating after 14 days exposure, when tested in accordance with ASTM D2247.
 - K. Mildew Resistance: No growth supported on finish coating during 28 day exposure period, when tested in accordance with ASTM D3273.
 - L. Abrasion Resistance Of Finish: No cracking, checking or loss of film integrity when tested in accordance with ASTM D968 with 113.5 gallons (500 liters) of sand.
3. MATERIALS
- A. Finish Coating Top Coat: Water-based, air curing, acrylic or polymer-based finish with integral color and texture.
 - 1. Texture: Dryvit Systems, Inc, with Hydrophobic (HDP) Additive; Sandblast HDP; www.dryvit.com/#sle.
 - 2. Color: Custom to match adjacent building surface as directed by Architect.
 - B. Base Coat: Fiber-reinforced, acrylic or polymer-based product compatible with insulation board and reinforcing mesh, Class PB.

- C. Reinforcing Mesh: Balanced, open weave glass fiber fabric, treated for compatibility and improved bond with coating, weight, strength, and number of layers as required to meet required system impact rating.
 - D. Expanded Polystyrene (EPS) Board Insulation: Complies with ASTM C578.
 - 1. Grooved Board: Back side of board adjacent to sheathing grooved with vertical channels designed to allow moisture to drain; at drainage points provide board configuration that permits drainage to the exterior.
 - 2. Board Thickness: As indicated on drawings.
 - E. Water-Resistive Barrier Coating: Fluid-applied air and water barrier membrane; applied to sheathing; furnished or approved by EIFS manufacturer.
4. ACCESSORIES
- A. Insulation Adhesive: Type required by EIFS manufacturer for project substrate.
 - B. Trim: EIFS manufacturer's standard PVC or galvanized steel trim accessories, as required for a complete project and including starter track and drainage accessories.
 - C. Sealant Materials: Compatible with EIFS materials and as recommended by EIFS manufacturer.

PART 3 EXECUTION

1. EXAMINATION
- A. Verify that substrate is sound and free of oil, dirt, other surface contaminants, efflorescence, loose materials, or protrusions that could interfere with EIFS installation and is of a type and construction that is acceptable to EIFS manufacturer. Do not begin work until substrate and adjacent materials are complete and thoroughly dry.
 - B. Verify that substrate surface is flat, with no deviation greater than 1/4 in (6 mm) when tested with a 10 ft (3 m) straightedge.
2. PREPARATION
- A. Install self-furring metal lath over solid substrates that are deemed unacceptable to receive adhesively applied insulation. Install in accordance with ASTM C1063, except for butt-lapping instead of overlapping.
 - 1. Attach to concrete and concrete masonry using corrosion-resistant power or powder actuated fasteners or hardened concrete stub nails not less than 3/4 inch (19 mm) long and with heads not less than 3/8 inch (9.5 mm) wide. Ensure that fasteners are securely attached to substrate and spaced at maximum 16 inches (406 mm) on center horizontally and 7 inches (178 mm) vertically.
3. INSTALLATION - GENERAL
- A. Install in accordance with EIFS manufacturer's instructions and ASTM C1397.
 - 1. Where different requirements appear in either document, comply with the most stringent.
 - 2. Neither of these documents supercedes provisions of Contract Documents that defines contractual relationships between parties or scope of this work.
4. INSTALLATION - WATER-RESISTIVE BARRIER
- A. Apply barrier coating as recommended by coating manufacturer; prime substrate as required before application.
 - B. Seal substrate transitions and intersections with other materials to form continuous water-resistive barrier on exterior of sheathing, using method recommended by manufacturer.
 - C. At door and window rough openings and other wall penetrations, seal water-resistive barrier and flexible flashings to rough opening before installation of metal flashings, sills, or frames, using method recommended by manufacturer.
 - D. Lap flexible flashing or flashing tape at least 2 inches (50 mm) on each side of joint or transition.

5. INSTALLATION - INSULATION
- A. Install in accordance with manufacturer's instructions.
 - B. Install back wrap reinforcing mesh at all openings and terminations that are not to be protected with trim.
 - C. On wall surfaces, install boards horizontally. On horizontal surfaces, install boards _____ .
 - D. Place boards in a method to maximize tight joints. Stagger vertical joints and interlock at corners. Butt edges and ends tight to adjacent board and to protrusions. Achieve a continuous flush insulation surface, with no gaps in excess of 1/16 inch (1.6 mm).
 - E. Fill gaps greater than 1/16 inch (1.6 mm) with strips or shims cut from the same insulation material.
 - F. Rasp irregularities off surface of installed insulation board.
6. INSTALLATION - CLASS PB FINISH
- A. Base Coat: Apply in thickness as necessary to fully embed reinforcing mesh, wrinkle free, including back-wrap at terminations of EIFS. Install reinforcing fabric as recommended by EIFS manufacturer.
 - 1. Lap reinforcing mesh edges and ends a minimum of 2-1/2 inches (64 mm).
 - 2. Allow base coat to dry a minimum of 24 hours before next coating application.
 - B. Apply finish coat after base coat has dried not less than 24 hours, embed finish aggregate, and finish to a uniform texture and color.
 - C. Seal control and expansion joints within the field of exterior finish and insulation system, using procedures recommended by sealant and finish system manufacturers.

END OF SECTION

Weather Barriers

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Water-Resistive Barrier: Under exterior wall cladding, over sheathing or other substrate; not air tight or vapor retardant.
 - B. Vapor Retarders: Materials to make exterior walls, joints between exterior walls and roof, joints around frames of openings in exterior walls, and ____ water vapor resistant and air tight.
2. RELATED REQUIREMENTS
 - A. Section 05.4000 - Cold-Formed Metal Framing: Water-resistive barrier under exterior cladding.
 - B. Section 06.1000 - Rough Carpentry: Water-resistive barrier under exterior cladding.
 - C. Section 07.2100 - Thermal Insulation: Vapor retarder installed in conjunction with batt insulation.
 - D. Section 07.5200 - Modified Bituminous Membrane Roofing: Vapor retarder installed as part of roofing system.
 - E. Section 07.6200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.
 - F. Section 07.9200 - Joint Sealants: Sealing building expansion joints.
3. DEFINITIONS
 - A. Weather Barrier: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders.
 - B. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.

Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.
 - C. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.
4. REFERENCE STANDARDS
 - A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
 - B. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
 - C. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
 - D. ICC-ES AC308 - Acceptance Criteria for Water-Resistive Barriers; ICC Evaluation Service, Inc.; 2013.
5. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data on material characteristics.
 - C. Shop Drawings: Provide drawings of special joint conditions.
 - D. Manufacturer's Installation Instructions: Indicate preparation.
6. MOCK-UP
 - A. Install mock-up using approved assembly in its entirety (incorporate into intergated exterior mock-up if applicable) per manufacturer's instructions.
 1. Size: 10 ft by 10ft
 2. Substrate: Match wall assembly construction, include window opening
 3. Mock-up may remain as part of the work once accepted by the Architect.
7. FIELD CONDITIONS
 - A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

PART 2 PRODUCTS

1. WEATHER BARRIER ASSEMBLIES
 - A. Air Barrier:
 1. On outside surface of sheathing of exterior walls use air barrier coating.
 - B. Exterior Vapor Retarder:
 1. On outside surface of sheathing use vapor retarder coating.
 2. On under side of elevated floors over enclosed soffit space use vapor retarder coating.
2. AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)
 - A. Air Barrier Sheet, Mechanically Fastened (WB#1):
 1. Air Permeance: 0.004 cubic feet per minute per square foot (0.02 L/s/sq m), maximum, when tested in accordance with ASTM E2178.
 2. Water Vapor Permeance: 28 perms (____ ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M MethodB.
 3. Water Penetration Resistance: Minimum 280 cm when tested in accordance with AATCC Test Method 127.
 4. Tensile Strength: Minimum 38/35 lbs/in., when tested in accordance with ASTM D882, Method A.
 5. Tear Resistance: 12/10 lbs., when tested in accordance with ASTM D1117.
 6. Surface Burning Characteristics: Class A, Flame spread index of 10 or less, and smoke developed index of 10 or less, when tested in accordance with ASTM E84.
 7. Seam and Perimeter Tape: Polyethylene self adhering type, mesh reinforced, 2 inches (50 mm) wide, compatible with sheet material; unless otherwise specified.
 8. Provide manufacturer approved Fasteners, Sealants, and Adhesives
 9. Use with compatible Flexible Membrane Flashing and Thru Wall Flashing at the following locations (See WP#3):
 - a. Window Openings and Penetrations
 - b. Changes in direction or elevation (shelf angles, foundations, etc.)
 - c. Transitions between between different assembly materials.
 10. Manufacturers:
 - a. DuPont Building Innovations; Tyvek Commercial Wrap with FlexWrap NF, StraightFlash, StraightFlash VF, Tyvek Wrap Caps, and Tyvek Tape: www.dupont.com. or approved equal.
 - b. Substitutions: See Section 01.6000 - Product Requirements.
 - B. Air Barrier Sheet, Self-Adhered Vapor Permeable (WB#2):
 1. Air Permeance: 0.004 cubic feet per minute per square foot (0.02 L/s/sq m), maximum, when tested in accordance with ASTM E2178.
 2. Water Vapor Permeance: 15 perms (____ ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant procedure).
 3. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 90 days of weather exposure.
 4. Fire Propagation Characteristics: Passes NFPA 285 testing as a part of an approved assembly.
 5. Sealants, Seam and Perimeter Tape: As recommended by sheet manufacturer.
 6. Use with compatible Flexible Membrane Flashing and Thru Wall Flashing at the following locations (See WP#3):
 - a. Window Openings and Penetrations
 - b. Changes in direction or elevation (shelf angles, foundations, etc.)
 - c. Transitions between between different assembly materials.

7. Manufacturers:
 - a. Henry Company; Blueskin VP160: www.henry.com/#sle.
 - b. Grace Construction Products; Perm-a-barrier VPS.
 - c. Substitutions: See Section 01.6000 - Product Requirements.
- C. Air Barrier, Fluid Applied: Vapor permeable, elastomeric waterproofing (WB#3).
 1. Air Barrier Coating:
 - a. Material: Silica-fortified rubber.
 - b. Dry Film Thickness (DFT): 40 mils (40 inch) (.040 mm), minimum.
 - c. Water Vapor Permeance: 10 perms (574 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M, Procedure B.
 - d. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 - e. Fire Propagation Characteristics: Passes NFPA 285 testing as a part of an approved assembly.
 - f. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
 - g. UV Exposure Limit: 180 Calendar Days.
 - h. Sealants, Tapes and Accessories: As recommended by coating manufacturer.
 - i. Use in conjunction with compatible fluid applied flashing material at windows and penetrations.
 - j. Use in conjunction with compatible transition membrane material at transitions to achieve air barrier continuity.
 - k. Manufacturers:
 - 1) Grace Construction Products, Perm-a-barrier VPL with Perm-a-barrier Detail Membrane and Perm-a-barrier Liquid Flashing
 - 2) Henry Company, Air Bloc 31MR with Blueskin VP160, Air-Bloc LF Liquid-Applied Flashing
 - 3) Sto Corp; Sto Air Seal with StoGuard Transition Membrane and StoGuard RapidSeal: www.stocorp.com/sle.
 - 4) _____.
 - 2.
3. ACCESSORIES
 - A. Sealants, Tapes, and Accessories for Sealing Weather Barrier and Sealing Weather Barrier to Adjacent Substrates: As specified or as recommended by weather barrier manufacturer.
 - B. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement is waived if not installed on a roof.
 - C. Liquid Flashing: One part, fast curing, non-sag, elastomeric, gun grade, trowelable liquid flashing.
 - D. Thinners and Cleaners: As recommended by material manufacturer.

PART 3 EXECUTION

1. EXAMINATION
 - A. Verify that surfaces and conditions are ready to accept the work of this section.
2. PREPARATION
 - A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
 - B. Clean and prime substrate surfaces to receive adhesives in accordance with manufacturer's instructions.
3. INSTALLATION
 - A. Install materials in accordance with manufacturer's instructions. Specifically follow manufacturer's instruction for fastening methods, patterns and spacing as well as treatment of openings and

penetrations.

B. Installation of Mechanically Fastened Sheets (WB#1) - On Exterior:

1. Install sheets shingle-fashion to shed water, with seams generally horizontal.
2. Overlap seams as recommended by manufacturer but at least 6 inches.
3. Overlap at outside and inside corners as recommended by manufacturer but at least 12 inches (305 mm).
4. Attach to framed construction with fasteners extending through sheathing into framing. Space fasteners at 12 to 18 inches (305 to 460 mm) on center along each framing member supporting sheathing.
5. Attach to masonry construction using mechanical fasteners spaced at 12 to 18 inches (305 to 460 mm) on center vertically and maximum 24 inches (610 mm) on center horizontally.
6. For applications specified to be air tight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners recommended by the manufacturer.
7. Where stud framing rests on concrete or masonry, extend lower edge of sheet at least 4 inches (100 mm) below bottom of framing (or as far as possible without being exposed if less than 4 inches) and seal to foundation with sealant.
8. Install water-resistive barrier over jamb flashings.
9. Install air barrier and vapor retarder UNDER jamb flashings.
10. Install head flashings under weather barrier.
11. At openings to be filled with frames having nailing flanges, wrap excess sheet into opening; at head, seal sheet over flange and flashing.

C. Installation of Fluid Applied Coating Weather Barrier (WB#3):

1. Prepare substrate in manner recommended by coating manufacturer; treat joints in substrate and between dissimilar materials as recommended by manufacturer.
2. Apply air barrier membrane to achieve a continuous air barrier according to air barrier manufacturer's written instructions.
3. Apply a continuous unbroken air barrier to substrates according to the following minimum thickness. Apply membrane in full contact around protrusions such as masonry ties.
 - a. Vapor-Permeable Membrane Air Barrier: 70-mil (1.8-mm) wet film thickness, 40-mil (1.0-mm) dry film thickness.
4. Use flashing to seal to adjacent construction and to bridge joints.

4. FIELD QUALITY CONTROL

- A. Do not cover installed weather barriers until required inspections have been completed.
- B. Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.
- C. Take digital photographs of each portion of the installation prior to covering up.

5. PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

Thermoplastic Membrane Roofing

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Adhered system with thermoplastic roofing membrane.
 - B. Insulation, tapered.
 - C. Cover boards.
 - D. Flashings.
 - E. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.
2. RELATED REQUIREMENTS
 - A. Section 05.3100 - Steel Decking: Placement of acoustical insulation for deck flutes.
 - B. Section 06.1000 - Rough Carpentry: Wood nailers and curbs.
 - C. Section 07.6200 - Sheet Metal Flashing and Trim: Counterflashings and reglets.
 - D. Section 07.7100 - Roof Specialties: Prefabricated roofing expansion joint flashing.
 - E. Section 07.7200 - Roof Accessories: Roof-mounted units; prefabricated curbs.
 - F. Section 22.1006 - Plumbing Piping Specialties: Roof drains, sumps, hoppers, and ____.
3. REFERENCE STANDARDS
 - A. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2012.
 - B. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation; 2015.
 - C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
 - D. ASTM C726 - Standard Specification for Mineral Wool Roof Insulation Board; 2012.
 - E. ASTM C728 - Standard Specification for Perlite Thermal Insulation Board; 2013.
 - F. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
 - G. ASTM C1484 - Standard Specification for Vacuum Insulation Panels; 2010.
 - H. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing; 2013.
 - I. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011.
 - J. FM (AG) - FM Approval Guide; current edition.
 - K. FM DS 1-28 - Wind Design; 2007.
 - L. NRCA (RM) - The NRCA Roofing Manual; 2017.
 - M. NRCA (WM) - The NRCA Waterproofing Manual; 2005.
4. ADMINISTRATIVE REQUIREMENTS
 - A. Preinstallation Meeting: Convene one week before starting work of this section.
 1. Review preparation and installation procedures and coordinating and scheduling required with related work.
5. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements for submittal procedures.
 - B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
 - C. Shop Drawings: Submit drawings that indicate joint or termination detail conditions, conditions of interface with other materials, and paver layout.
 - D. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.
 - E. Manufacturer's qualification statement.
 - F. Installer's qualification statement.
 - G. Warranty Documentation:

1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
 2. Submit installer's certification that installation complies with warranty conditions for waterproof membrane.
6. **QUALITY ASSURANCE**
- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
 - B. Installer Qualifications: Company specializing in performing work of this section with at least three years of documented experience.
7. **DELIVERY, STORAGE, AND HANDLING**
- A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.
 - B. Store materials in weather protected environment, clear of ground and moisture.
 - C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.
 - D. Protect foam insulation from direct exposure to sunlight.
8. **FIELD CONDITIONS**
- A. Do not apply roofing membrane during unsuitable weather.
 - B. Do not apply roofing membrane when ambient temperature is below 40 degrees F (5 degrees C) or above ____ degrees F (____ degrees C).
 - C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
 - D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
 - E. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.
9. **WARRANTY**
- A. See Section 01.7800 - Closeout Submittals for additional warranty requirements.
 - B. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within five years after installation.
 - C. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
 1. Warranty Term: 20 years.
 2. For repair and replacement include costs of both material and labor in warranty.

PART 2 PRODUCTS

1. **MANUFACTURERS**
 - A. Thermoplastic Polyolefin (TPO) Membrane Roofing Materials:
 1. Carlisle Roofing Systems, Inc; Sure-Weld TPO: www.carlisle-syntec.com/#sle.
 2. Substitutions: See Section 01.6000 - Product Requirements.
 - B. Insulation:
 1. Carlisle SynTec; SecurShield Insulation: www.carlisle-syntec.com/#sle.
 2. Owens Corning Corporation; ____: www.ocbuildingspec.com/#sle.
 3. Substitutions: See Section 01.6000 - Product Requirements.
2. **ROOFING - UNBALLASTED APPLICATIONS**
 - A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered, over insulation.
 - B. Roofing Assembly Requirements:

1. Solar Reflectance Index (SRI): Minimum of 64 based on three-year aged value; if three-year aged data is not available, minimum of 82 initial value.
 - a. Calculate SRI in accordance with ASTM E1980.
 - b. Field applied coating may not be used to achieve specified SRI.
2. Factory Mutual Classification: Class 1 and windstorm resistance of 1-90, in accordance with FM DS 1-28.
3. Insulation Thermal Resistance (R-Value): [30], minimum; provide insulation of thickness required.
- C. Acceptable Insulation Types - Tapered Application: Any of types specified.
 1. Tapered polyisocyanurate, perlite, or extruded polystyrene board.
 2. Tapered polyisocyanurate, perlite, extruded polystyrene, or cellular glass board covered with uniform thickness cellulose, perlite, molded polystyrene, polyisocyanurate, glass fiber, extruded polystyrene, or composite board.
 3. Uniform thickness cellulose, perlite, composite, polyisocyanurate, extruded polystyrene, molded polystyrene, glass fiber, or cellular glass board covered with tapered polyisocyanurate, extruded polystyrene, or perlite board.
3. MEMBRANE ROOFING AND ASSOCIATED MATERIALS
 - A. Membrane Roofing Materials:
 1. TPO: Thermoplastic polyolefin (TPO) complying with ASTM D6878/D6878M, sheet contains reinforcing fabrics or scrim.
 - a. Thickness: 60 mil, 0.060 inch (1.5 mm), minimum.
 2. Sheet Width:
 3. Color: As selected by Architect from manufacturer's full color range.
 - B. Seaming Materials: As recommended by membrane manufacturer.
 - C. Flexible Flashing Material: Same material as membrane.
4. COVER BOARDS
 - A. Cover Boards: Glass-mat faced gypsum panels complying with ASTM C1177/C1177M.
5. INSULATION
 - A. Cellulose Fiber Board Insulation: ASTM C208 Type II; natural finish.
 - B. Perlite Board Insulation: Expanded perlite mineral aggregate, complying with ASTM C728.
 1. Board Size: 24 by 48 inches (619 by 1,220 mm).
 2. Board Thickness: 1/2 inch (12.7 mm).
 3. Tapered Board: Slope as indicated; minimum thickness ____ inch (____ mm); fabricate of fewest layers possible.
 - C. Expanded Polystyrene (EPS) Board Insulation: Comply with ASTM C578, with drainage channels on one face.
 1. Board Size: 48 by 96 inches (1,220 by 2,440 mm).
 - D. Glass Fiber Board Insulation: Rigid glass fiber, ASTM C726; top surface coated with asphalt and Kraft paper.
 1. Board Size: 48 by 48 inches (1,220 by 1,220 mm).
 2. Board Thickness: 1 inch (25.4 mm).
 - E. Extruded Polystyrene (XPS) Board Insulation: Comply with ASTM C578 with natural skin surface, drainage channels on one face.
 1. Board Size: 48 by 96 inches (1,220 by 2,440 mm).
 2. Board Thickness: 1-1/2 inches (38 mm).
 3. Tapered Board: Slope as indicated; minimum thickness 1/2 inch (12.7 mm); fabricate of fewest layers possible.

- F. Composite Vacuum Insulated Panel Insulation: ASTM C1484, vacuum insulated panel.
 - 1. Integral Protection Boards: Manufacturer's standard.
 - G. Cellular Glass Board Insulation: Complying with ASTM C552, Type IV.
 - 1. Board Size: 48 by 24 inches (1,219 by 610 mm).
 - 2. Board Thickness: 2 inches (51 mm).
6. ACCESSORIES
- A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
 - B. Cant and Edge Strips: Wood fiberboard, compatible with roofing materials; cants formed to 45 degree angle.
 - C. Sheathing Joint Tape: Paper type, ____ inches (____ mm) wide, self adhering.
 - D. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches (152 mm) wide; self adhering.
 - E. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
 - F. Membrane Adhesive: As recommended by membrane manufacturer.
 - G. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
 - H. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.
 - I. Insulation Adhesive: As recommended by insulation manufacturer.
 - J. Strip Reglet Devices: Galvanized steel, maximum possible lengths per location, with attachment flanges.
 - K. Insulation Perimeter Restraint: Stainless steel edge device configured to restrain insulation boards in position and provide top flashing over ballast.
 - L. Sealants: As recommended by membrane manufacturer.
 - M. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
 - 1. Composition: Asphaltic with mineral granule surface.
 - 2. Surface Color: White or Yellow.

PART 3 EXECUTION

- 1. EXAMINATION
 - A. Verify that surfaces and site conditions are ready to receive work.
 - B. Verify deck is supported and secure.
 - C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
 - D. Verify deck surfaces are dry and free of snow or ice.
 - E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.
- 2. PREPARATION - METAL DECK
 - A. Install preformed acoustical glass fiber insulation strips in roof deck flutes in accordance with manufacturer's instructions; see Section 05.3100.
 - B. Install deck sheathing on metal deck:
 - 1. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.
 - 2. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.
 - 3. Tape joints.
- 3. INSTALLATION, GENERAL
 - A. Perform work in accordance with manufacturer's instructions, NRCA (RM), and NRCA (WM) applicable requirements.

- B. Do not apply roofing membrane during cold or wet weather conditions.
 - C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
 - D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
 - E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
 - F. Coordinate this work with installation of associated counterflashings installed by other sections as the work of this section proceeds.
4. INSTALLATION - VAPOR RETARDER AND INSULATION, UNDER MEMBRANE
- A. Install vapor retarder to deck surface with adhesive in accordance with manufacturer's instructions.
 - 1. Extend vapor retarder under cant strips and blocking to deck edge.
 - 2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.
 - B. Cover Boards: Mechanically fasten cover boards in accordance with roofing manufacturer's instructions and FM (AG) Factory Mutual requirements.
 - C. Lay subsequent layers of insulation with joints staggered minimum 6 inches (152 mm) from joints of preceding layer.
 - D. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
 - E. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.
 - F. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
 - G. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.
 - H. Do not install more insulation than can be covered with membrane in same day.
5. INSTALLATION - MEMBRANE
- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
 - B. Shingle joints on sloped substrate in direction of drainage.
 - C. Fully Adhered Application: Apply adhesive to substrate at rate of ___ gallons per square foot (___ L/sq m). Fully embed membrane in adhesive except in areas directly over or within 3 inches (76 mm) of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
 - D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches (76 mm). Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
 - E. At intersections with vertical surfaces:
 - 1. Extend membrane over cant strips and up a minimum of 4 inches (102 mm) onto vertical surfaces.
 - 2. Fully adhere flexible flashing over membrane and up to nailing strips.
 - F. Around roof penetrations, seal flanges and flashings with flexible flashing.
 - G. Coordinate installation of roof drains and sumps and related flashings.
6. FIELD QUALITY CONTROL
- A. See Section 01.4000 - Quality Requirements, for general requirements for field quality control and inspection.
 - B. Provide daily on-site attendance of roofing and insulation manufacturer's representative during installation of this work.
7. CLEANING
- A. See Section 01.7419 - Construction Waste Management and Disposal for additional requirements.
 - B. Remove bituminous markings from finished surfaces.

- C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.
 - D. Repair or replace defaced or damaged finishes caused by work of this section.
8. PROTECTION
- A. Protect installed roofing and flashings from construction operations.
 - B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

Sheet Metal Flashing and Trim

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Fabricated sheet metal items, including sill flashings, base flashings and counterflashings.
 - B. Coatings and Sealants as required sheet metal fabrications.
 - C. Reglets, termination bars and accessories.
 - D. Miscellaneous sheet metal accessories.
2. REFERENCE STANDARDS
 - A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
 - B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
 - C. CDA A4050 - Copper in Architecture - Handbook; current edition.
 - D. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.
3. SUBMITTALS
 - A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
4. QUALITY ASSURANCE
 - A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
 - B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.
5. DELIVERY, STORAGE, AND HANDLING
 - A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
 - B. Store materials in a dry, protective, well-vented area. The contractor shall report damaged material immediately to the delivering carrier and note such damage on the carrier's freight bill.
 - C. Prevent contact with materials that could cause discoloration or staining.
 - D. Remove protective plastic surface film immediately after installation (if applicable).

PART 2 PRODUCTS

1. SHEET MATERIALS
 - A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 22 gauge ____ inch (____ mm) thick base metal, shop pre-coated with PVDF coating.
 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
 2. Color: As selected by Architect from manufacturer's standard colors.
 - B. Stainless Steel: ASTM A666, Type 304, soft temper, 24 gauge ____ inch (____ mm) thick; smooth No. 4 finish.
2. ACCESSORIES
 - A. Sealant Tape: Pressure sensitive, 100 percent solids. gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non sag, non toxic, non staining tape 1/2 inch wide and 1/8 inch thick.
 - B. Sealant to be Concealed in Completed Work: Non-curing butyl sealant. ASTM C1311

3. FABRICATION

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's Architectural Sheet Metal Manual that apply to design, dimensions, geometry, metal thickness and other characteristics of item indicated.
 - 1. Obtain field measurements fo accurate fit before shop fabrication.
 - 2. Form sheet metal flashing ant trim without excessive oil canning, buckling, and tool marks. Form true to level and line and levels indicated,with exposed edges folded back to form hems.
 - 3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- C. Form pieces in longest possible lengths.
- D. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.
- E. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- F. Expansion Provisions: Wher lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
- G. Fabricate Cleats and attachment devices from same material as accessory being anchored or from compatible, non corrosive material.

4. SHEET METAL FABRICATIONS

- A. Base Flashing: Pre finished galvanized steel: 20 gauge thick
- B. Counterflashing and Flashing Receivers: Prefinished galvanized steel: 22 gauge thick
- C. Sill flashings: Stainless Steel: 24 gauge thick
- D. Miscellaneous Flashing: Stainless Steel: 24 gauge thick

PART 3 EXECUTION

1. EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

2. PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.

3. INSTALLATION

- A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..
- B. Apply plastic cement compound between metal flashings and felt flashings.
- C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Seal metal joints watertight.
- E. Slope gutters 1/4 inch per 10 feet (2.1 mm per m), minimum.
- F. Connect downspouts to downspout boots, and grout connection watertight.

4. FIELD QUALITY CONTROL

- A. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION

SECTION 078400
FIRESTOPPING (UMMC)

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Fire caulking, stopping and sealing of all penetrations in a fire rated or smoke wall assembly.
- B. Fire stopping and sealing of all pipe, conduit, sleeves, cables, outlet devices, etc. where penetrating a fire/smoke rated wall, floor, ceiling or other assembly.
- C. Fire sealing around all ductwork, louver(s), access doors, equipment, etc., penetrating a fire rated assembly or smoke wall.
- D. Fire stopping of all construction and expansion joints, when fire rated walls and floors intersect; and where fire rated walls and floors intersect with curtain wall or other fire rated and/or exterior construction.
- E. Fire stopping and sealing around all shafts, stairwells, horizontal exists or other service/egress enclosures where they penetrate a rated floor, partition, ceiling, smoke wall or exterior wall.
- F. Labeling of all floors, wall, ceiling, and other rated assemblies with labels and stenciling indicating fire or smoke rating.
- G. Labeling of all through wall penetrations with Firestop Identification Labels, adhered to walls at each penetration.

1.02 RELATED WORK AND APPLICABLE REQUIREMENTS: Specified elsewhere.

- A. Divisions 0 and 1 – Contract Documents and General Requirements.
- B. Related work:
 - 1. DIVISION 4 – MASONRY
 - 2. DIVISION 5 – METALS
 - 3. DIVISION 6 – WOODS & PLASTICS
 - 4. DIVISION 7 – THERMAL AND MOISTURE PROTECTION
 - 5. DIVISION 9 – FINISHES
 - 6. DIVISION 15 – MECHANICAL
 - 7. DIVISION 16 – ELECTRICAL

1.03 REFERENCES

- A. ASTM E 814, UL 1479, and UBC 7-5: "Standard Method of Fire Tests of Through-Penetration Firestops"
- B. ASTM E 119, UL263, and UBC 7-1: "Standard Method of Fire Tests of Building Construction and Materials"
- C. UL 2079: "Standard Method of Fire Tests of Building Joint Systems:

1.04 QUALITY ASSURANCE

- A. Fire stopping materials shall conform to Flame (F) and Temperature (T) ratings as required by local building code and as tested by nationally accepted test agencies per ASTM E 814, UL 1479 or UL 2079. The (F) rating must be a minimum of one (1) hour but not less than the fire resistance rating of the assembly being penetrated. (T) rating shall be based on the measurement of the temperature rise on the penetrating item(s). The fire test pressure differential of a minimum 0.01 inches of water column is required.
- B. Fire stopping products shall be free of asbestos, PCBs, lead or other toxic material.
- C. Do not use any product containing solvents, binders, or other additives that may require hazardous waste disposal.
- D. All aspects of work required under this Section shall be products of only one approved manufacturer; and be performed by only the approved specialty contractor.
- E. Under provisions of this Section, the approved manufacturer shall provide a qualified technical representative ("field engineer") to serve as a "Field Representative" for site visits, technical support, application selection, site evaluation, and other necessary responsibilities. This Field Representative shall be:
 - 1. A full time employee of the approved manufacturer.
 - 2. On-site at the Project as follows:
 - a. For Pre-Construction Conference.
 - b. At least four (4) times during the major portions of the work as it progresses, and be present with the Architect and Owner.
 - c. Upon Architect or Owner's request, whenever materials and/or workmanship appear to not comply with specified requirements.
 - 3. To be knowledgeable of applicable Codes and the installation requirements of Fire Stop System proposed.
 - 4. Authorized to represent the manufacturer in all application decisions, render engineering judgments and make decisions necessary to insure compliance with all applicable 'UL' and 'FM' testing.

1.05 CONTRACTOR QUALIFICATIONS

- A. Contractor shall have been in the "Firestop" business a minimum of three (3) years, with documented experience acceptable to the Architect and Owner. Contractor shall be trained and licensed specifically in this discipline. Contractor shall submit Qualifications to the Owner & Architect during the preconstruction meeting.
- B. Contractor shall have at least one (1) person who holds a certification of, or equal to "Inspector Level", or better from Specified Technologies, Inc., 3-M Fire Protection or any other system pre-approved by the Owner. This individual shall function as a supervisor, and have held the level of "Inspector" expertise for a minimum of three prior consecutive years. Contractor shall provide a list of references where work was performed on comparable projects.
- C. Specially trained and licensed personnel in this discipline shall perform "Firestop" installations and applications. Said applicators shall have received specific training and certification of, or equal to, or better than "Level 1" by Specified Technologies, Inc. or "Level 2" by 3-M Fire Protection.

- E. Each applicator shall have a minimum of two (2) years' experience installing "Firestop" systems, after receiving the proper certification of the type herein specified. Current copies of certifications shall be on file with the Owner (see 1.06 Submittals) prior to performing work.

1.06 SUBMITTALS

- A. Submit manufacturer's product literature for each type of "Firestop" material to be installed. Literature shall indicate product characteristics, typical uses, performance, limitation criteria and test data, and Material Safety Data Sheets.
- B. Submit manufacturer's Warranty.
- C. Submit shop drawings showing typical installation details for methods and procedures. Indicate which firestop materials will be used and installation requirements for different hourly ratings.
- D. Submit qualifications of firestop contractor, including:
 - 1. Certificates from "Firestop" manufacturer(s) wherein manufacturer approves and recognizes contractor for installation of that manufacturer's products.
 - 2. List of project names with contact person and phone number, along with list of firestop products installed at each project listed. Provide date (month/year) installed.
 - 3. Current certificates of applicators and supervisors as outlined herein above.
- E. Provide certificate of compliance, identifying the UL® systems proposed.
- F. Provide sample copies of proposed labels, or painted "stenciling" on actual material where proposed to be installed.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in the manufacturer's original, unopened containers or packages with manufacturer's name, product identification, lot numbers, UL® or Warnock Hersey labels, and mixing and installation instructions, as applicable.
- B. Store materials in the original, unopened containers or packages, and under conditions recommended by the manufacturer.
- C. All firestop materials shall be installed prior to expiration of shelf life.

1.08 PROJECT CONDITIONS

- A. Field verify existing conditions and inspect substrates before starting work. Commencement of work establishes that finishes, materials and construction are acceptable to this contractor and manufacturer for installation.
- B. Do not use materials that contain organic solvents.
- C. During installation, provide masking, drop cloths and other means as needed to prevent fire stopping products from contaminating any adjacent surfaces and finishes.
- D. Conform to ventilation requirements of manufacturer's installation instructions for Material Safety Data Sheet.

- E. Do not proceed with installation of firestop products when temperatures are in excess of, or below the manufacturer's recommendations.
- F. Schedule installation of firestop products after completion of penetrating item installation but prior to covering or concealing of openings.
- G. Coordinate this section with work of all other trades. Failure to properly schedule efforts with other work, which results in the removal and/or demolition of completed work to effect firestop efforts will be at no additional cost to this contract.

1.09 ACCEPTABLE MANUFACTURERS

- A. The listing of approved manufacturer's is not to provide an exclusive source but to establish a level of quality and set a standard. Other supplier's may be submitted for consideration but this does not relieve the Contractor from providing a product meeting the requirements as set forth herein.
- B. Acceptable manufacturers are Spec Seal Firestop Products, Fire Protection Products, 3-M Fire Protection, or approved equal.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Fire stopping:
 1. Wall/floor/ceiling assemblies subject to movement: an elastomeric, non-toxic, single component, non-halogenated silicone emulsion; when cured is water resistant, and conforms to UL2079, for high movement areas, showing no degradation when exposed to 'UV' light.
 2. Metallic pipe/conduit/sleeve penetrations: an elastomeric, non-toxic, single component, non-halogenated latex sealant conforming to UL1479. The 3M Fire Barrier Putty Sleeve Kits are recommended.
 3. Cabling/'PVC' pipe/tubing penetrations: a latex intumescent non-toxic wrap or caulk having no hygroscopic ingredients conforming to UL1429 with a minimum volume expansion of 25X, beginning at 250° F and exhibiting no change in character over age reactivation.
 4. All fire stopping shall be from the same manufacturer and of the same color for the specific types of installation, with color as approved by Owner/Architect.
- B. Forming/Damming: Fiberglass or mineral fiber boards or blankets compatible with proposed fire stopping per manufacturer's recommendations.
- C. Firestop Collars: Prefabricated or molded collars, or prefabricated retaining strips of galvanized steel per manufacturer's recommendations.
- D. Labels/Stenciling: Preprinted "Fire Rating" labels with minimum two (2") inch high lettering, red or orange in color on a contrasting background; or, painted two (2") inch high stenciling, orange or red with a painted background in white, three (3") inches larger on all sides than lettering.
- E. Patching: Where a Fire or Smoke Wall that is constructed of drywall must be patched. The patch shall be proper thickness, flush fitted, taped and mudded with no exposed screw or nail heads.

Drywall scab patches will not allowed.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine all areas and conditions where firestops and/or fire caulking is to be installed and notify the Architect/Owner of all conditions detrimental to the proper performance or conformance of materials, assemblies or installation.
- B. Verify the penetrating item(s) are permanently installed and construction of fire-rated or smoke assemblies is complete prior to firestop installation.
- C. Prior to installation of firestop systems, clean surfaces and penetrating item(s) that will be in contact with firestop materials. Do not use any cleaning material that will be detrimental to penetrating item(s) or firestop product to be installed.

3.02 CONDITIONS REQUIRING FIRESTOPPING

A. General:

- 1. Provide fire stopping or sealing for all conditions specified or not, whether such material is designated as insulation, safing or otherwise.
- 2. Insulation types specified in other Sections shall not be installed in lieu of fire stopping material specified herein.

B. Building Exterior Perimeters:

- 1. Where exterior wall construction is continuous past a structural floor, and a space (i.e. construction joint) which would otherwise remain open, install fire stopping between the inner face of the wall and the outer perimeter edge of the structural floor, provide fire stopping equal to the fire resistance of the assembly.
- 2. Fire stopping shall be provided whether or not there are any clips, angles, plates or other members bridging or interconnecting the facing and floor systems, and whether or not such items are continuous.
- 3. Where an exterior wall of composite type construction passes a perimeter structural member, such as a girder, beam or strut and the finish on the interior wall face does not continue on the underside of the structural floor above, provide fire stopping to continuously fill such open space.

C. Interior Walls and Partitions:

- 1. Construction joints between top of fire-rated and smoke walls and underside of floors above, shall be fire stopped.
- 2. Intersection of fire walls with shafts, stairways, and other rated assemblies.
- 3. Firestop system used shall allow for deflection of the floor above.

D. Metallic Pipe Penetrations: Where all pipes, conduits, sleeves or other devices not subject to deterioration by flammability penetrate a fire rated or smoke wall, floor or ceiling assembly.

- E. Cabling, Tubing, or Other Piper Penetrations: Where all cables, wiring, tubing, or other device subject to melting or deterioration which penetrate a fire rated or smoke wall, floor or ceiling assembly.
- F. Provide fire stopping to fill miscellaneous voids and openings in all fire-rated or smoke wall construction in a manner similar to specified herein before.

3.03 INSTALLATION

- A. Install firestop products in accordance with fire-rated test assemblies and as published by either UL[®] or Warnock Hersey, or in accordance with manufacturer approved engineering drawings.
- B. Comply with manufacturer's instructions for installation of through-penetration firestop systems;
 - 1. Firestop all holes or voids in fire resistive or smoke assemblies, made by penetrations to ensure against the passage of flames, smoke, and gases.
 - 2. Protect materials from damage to surface, subjected to traffic and install cover plates as required on all installed firestop systems.
 - 3. Tool surfaces of firestop products to provide a smooth, neat and clean appearance.
 - 4. Provide 3"x5" Firestop Identification Labels at all through wall penetration locations. Refer to 3.04, Part D. for description of required labels.

3.04 FIELD QUALITY CONTROL

- A. Follow safety procedures recommended in Safety Data Sheets (SDS).
- C. Examine fire stopped penetrations and other areas to ensure proper installation of fireproofing, before concealing or enclosing space.
- D. Keep areas of work accessible until inspection by Architect/Owner has been completed.
- E. Provide 3"x5" Firestop Identification Labels at all through wall penetrations, adhered to each wall penetrated. These labels should contain the following information: Date of Installation, Contractor (or subcontractor) name, project #, UL assembly of wall penetrated, installer signature. The basis of design for labels shall be equal to those manufactured by 3M, Part Number: Firestop-ID-LABEL, UPC: 05111554917.

3.05 ASSEMBLY IDENTIFICATION

- A. Install preprinted labels and/or stenciling identifying all fire/smoke rated assemblies (wall, floors, ceilings, etc.) as to the designation of rating (i.e. 2 Hour, 1 Hour, Smoke Wall, etc.)
- B. Walls:
 - 1. Identification shall be located on each side of a wall, with labeling staggered such that each marker does not occur directly opposite the other side.
 - 2. Identification shall be located above ceilings; in chases, mechanical/electrical/equipment rooms; pipe corridors and shafts; elevator shafts and stairwells; and all other areas where identifying markers do not present an objectionable presence.

3. Location:
 - a. Markers shall be located approximately fifty (50') feet on center at long continuous walls, such as a corridor.
 - b. Markers shall be on each side of an outside corner where walls change direction.
 - c. Markers shall be at larger pipe/duct/equipment penetrations, or where several smaller penetrations are grouped together.
 - d. Markers shall be at all opening type penetrations (i.e. fire dampers, scuttles, access doors, etc.)
 - e. Markers shall be at other locations deemed necessary by Owner/Architect, and to comply with code recommendations.

C. Ceilings/Floors:

1. Identification shall be located in all areas where identifying markers do not present an objectionable presence, such as mechanical/electrical/equipment rooms, plumbing chases and pipe corridors, service closets, etc.
2. Labels/stenciling shall be similar to that outlined above for walls as two (2") inch high, red or orange letters on contrasting background, except as indicated herein.
3. Rated ceilings/floors shall be identified at each opening type penetration (i.e. fire dampers, scuttles, access doors, etc.). These locations shall be marked at the "opening" in one (1") inch high lettering of an unobtrusive color (i.e. black, gray, and white, as directed per Owner).

3.06 ADJUSTING AND CLEANING

- A. Neatly cut and trim materials as required.
- B. Clean all damaged or stained surfaces from drips or spills.
- C. Remove equipment, materials and debris, leaving areas undamaged and in clean condition.

END OF SECTION

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Nonsag gunnable joint sealants.
 - B. Self-leveling pourable joint sealants.
 - C. Joint backings and accessories.
2. RELATED REQUIREMENTS
 - A. Section 09.2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
 - B. Section 09.3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.
3. REFERENCE STANDARDS
 - A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).
 - B. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).
 - C. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2022.
 - D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
 - E. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2023.
 - F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).
 - G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.
4. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements for submittal procedures.
 - B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include 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. Backing material recommended by sealant manufacturer.
 4. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 5. Substrates the product should not be used on.
 6. Substrates for which use of primer is required.
 - C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
 - D. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.
 - E. Executed warranty.
5. 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. Allow sufficient time for testing to avoid delaying the work.
 4. Deliver sufficient samples to manufacturer for testing.
 5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
6. WARRANTY
- A. See Section 01.7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

1. MANUFACTURERS

A. Nonsag Sealants:

1. Dow; ____: www.dow.com/#sle.
2. Pecora Corporation; ____: www.pecora.com/#sle.
3. Sika Corporation; ____: www.usa.sika.com/#sle.
4. Tremco Commercial Sealants & Waterproofing; ____: www.tremcosealants.com/#sle.
5. W. R. Meadows, Inc; ____: www.wrmeadows.com/#sle.
6. Substitutions: See Section 01.6000 - Product Requirements.

2. JOINT SEALANT APPLICATIONS

A. Scope:

1. Exterior Joints:
 - a. Seal the following joints:
 - 1) Wall expansion and control joints.
 - 2) Joints between doors, windows, and other frames or adjacent construction.
 - 3) Joints between different exposed materials.
2. Interior Joints:
 - a. Seal the following joints:
 - 1) Joints between door frames and window frames and adjacent construction.
 - 2) In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, and piping penetrations.
 - 3) In sound-rated wall and ceiling assemblies, seal joints between wall assemblies and ceiling assemblies; between wall assemblies and other construction; between ceiling assemblies and other construction.
3. Do Not Seal:
 - a. Intentional weep holes in masonry.
 - b. Joints indicated to be covered with expansion joint cover assemblies.
 - c. Joints where sealant is specified to be furnished and installed by manufacturer of product to be sealed.
 - d. Joints where sealant installation is specified in other sections.
 - e. Joints between suspended ceilings and walls.

B. Exterior Joints: Use nonsag acrylic-urethane sealant, unless otherwise indicated.

C. Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.

1. Wall and Ceiling Joints in Wet Areas: Nonsag polyurethane sealant for continuous liquid immersion.
2. Floor Joints in Wet Areas: Nonsag polyurethane non-traffic-grade sealant suitable for continuous liquid immersion.

- 3. Joints between Tile in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
- 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.
- 3. NONSAG JOINT SEALANTS
 - A. 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: White.
 - B. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; 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: Match adjacent finished surfaces.
 - 4. Service Temperature Range: Minus 40 to 180 degrees F (Minus 40 to 82 degrees C).
 - 5. Products:
 - a. Master Builders Solutions; MasterSeal NP1: www.master-builders-solutions.com/en-us/#sle.
 - b. Tremco Commercial Sealants & Waterproofing; Dymonic 100: www.tremcosealants.com/#sle.
 - c. W. R. Meadows, Inc; POURTHANE NS: www.wrmeadows.com/#sle.
 - d. Substitutions: See Section 01.6000 - Product Requirements.
 - C. Acrylic-Urethane Sealant: 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. Hardness Range: 15 to 40, Shore A, when tested in accordance with ASTM C661.
- 4. SELF-LEVELING JOINT SEALANTS
 - A. 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. Color: To be selected by Architect from manufacturer's standard range.
 - 3. Service Temperature Range: Minus 40 to 180 degrees F (Minus 40 to 82 degrees C).
 - B. ---- Hybrid Silane Polyether for Interior and Exterior Horizontal Applications ----
- 5. ACCESSORIES
 - A. Sealant Backing Materials, General: Materials placed in joint before applying sealants; assists sealant performance and service life by developing optimum sealant profile and preventing three-sided adhesion; type and size recommended by sealant manufacturer for compatibility with sealant, substrate, and application.
 - B. Sealant Backing Rod, Closed-Cell Type:
 - 1. Cylindrical flexible sealant backings complying with ASTM C1330 Type C.
 - 2. Size: 25 to 50 percent larger in diameter than joint width.
 - C. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
 - D. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

- E. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- F. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

1. EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.

2. 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.

3. INSTALLATION

- A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Provide joint sealant installations complying with ASTM C1193.
- C. Install 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.

END OF SECTION

Hollow Metal Doors and Frames

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Non-fire-rated hollow metal doors and frames.
 - B. Hollow metal frames for wood doors.
2. RELATED REQUIREMENTS
 - A. Section 08.7100 - Door Hardware.
 - B. Section 08.8000 - Glazing: Glass for doors and borrowed lites.
 - C. Section 09.9123 - Interior Painting: Field painting.
3. REFERENCE STANDARDS
 - A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
 - B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.
 - C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
 - D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.
 - E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
 - F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.
 - G. 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; 2014.
 - H. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
 - I. ASTM E413 - Classification for Rating Sound Insulation; 2010.
 - J. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.
 - K. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.
 - L. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
 - M. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.
 - N. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2006.
 - O. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.
 - P. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2013.
 - Q. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
4. 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 any indicated finish requirements.
 - D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

5. QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
 - B. Templates: The metal door and frame manufacture shall obtain templates of all applicable hardware from the finish hardware supplier under the coordination of the Contractor and shall make all associated and proper provisions for the installation of hardware.
 - C. Maintain at project site copies of reference standards relating to installation of products specified.
6. DELIVERY, STORAGE, AND HANDLING
 - A. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

1. MANUFACTURERS
 - A. Hollow Metal Doors and Frames:
 1. Ceco Door, an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
 2. Curries, an Assa Abloy Group company: www.assaabloydss.com.
 3. Steelcraft, an Allegion brand: www.allegion.com/sle.
 4. Substitutions: See Section 01.6000 - Product Requirements.
2. DESIGN CRITERIA
 - A. Requirements for Hollow Metal Doors and Frames:
 1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
 3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
 4. Door Edge Profile: Manufacturers standard for application indicated.
 5. Typical Door Face Sheets: Flush.
 6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
 7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
 8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
 - a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.
 - B. Hollow Metal Panels: Same construction, performance, and finish as doors.
 - C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with 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.

3. HOLLOW METAL DOORS

- A. Door Finish: Factory primed and field finished.
- B. Exterior Doors: Thermally insulated.
 - 1. Core Material: Manufacturers standard core material/construction and in compliance with requirements.
 - 2. Door Thermal Resistance: R-Value of ____.
 - 3. Door Thickness: 1-3/4 inch (44.5 mm), nominal.
 - 4. Top Closures for Outswinging Doors: Flush with top of faces and edges.
 - 5. Door Face Sheets: Flush.
 - 6. Weatherstripping: Refer to Section 08.7100.
- C. Interior Doors, Non-Fire Rated:
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B 500 000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Zinc Coating: A60/ZF180 galvanized coating; ASTM A653/A653M.
 - 2. Core Material: Kraftpaper honeycomb.
 - 3. Door Thickness: 1-3/4 inch (44.5 mm), nominal.
- D. Fire-Rated Doors:
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B 500 000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - 2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
 - a. Provide units listed and labeled by UL (DIR) or ITS (DIR).
 - b. Attach fire rating label to each fire rated unit.
 - 3. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
 - 4. Door Thickness: 1-3/4 inch (44.5 mm), nominal.
- E. Sound-Rated Interior Doors:
 - 1. Sound Transmission Class (STC) Rating of Door and Frame Assembly: STC of ____, calculated in accordance with ASTM E413, and tested in accordance with ASTM E90.
 - 2. Door Core Material: Manufacturer's standard construction as required to meet acoustic requirements indicated.
 - 3. Door Thickness: As required to meet acoustic requirements indicated.
 - 4. Sound Seals: Refer to Section 08.7100.
 - 5. Opening Force of Sound-Rated Doors, Non-Fire Rated: 5 lbs (22.2 N), maximum, in compliance with ADA Standards.

4. HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Frame Finish: Factory primed and field finished.
- C. Interior Door Frames, Non-Fire Rated: Face welded type.
 - 1. Frame Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.
- D. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

- E. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.
 - F. Transom Bars: Fixed, of profile same as jamb and head unless otherwise shown in drawings.
 - G. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
 - H. Frames in Masonry Walls: Size to suit masonry coursing with head member to fill opening without cutting masonry units.
 - I. Anchors: Provide a minimum of three (3) metal anchors at each jamb for frames up to 7'-4" in height and a minimum of five (5) metal anchors for all taller frames.
 - 1. Provide "T" types anchors at masonry walls.
 - 2. Provide manufacturers recommended anchors at stud framing.
 - J. Hardware Reinforcing: Weld to inner surface of jambs and provide cover boxes behind all hardware cut outs:
 - 1. High reinforcements to be per referenced standards but no less than 8 guage min.
 - 2. Balance of reiforement to be be referenced standards but no less than 12 guage min.
 - K. Frames Wider than 24 Inches (609 mm): Reinforce with steel channel fitted tightly into frame head, flush with top.
 - L. Frames Installed Back-to-Back: Reinforce with steel channels anchored to floor and overhead structure.
5. FINISHES
- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
6. ACCESSORIES
- A. Louvers: Roll formed steel with overlapping frame; finish same as door components ; factory-installed.
 - 1. In Fire-Rated Doors: UL (DIR) or ITS (DIR) listed fusible link louver, same rating as door.
 - 2. Style: _____.
 - 3. Fasteners: Exposed, tamper proof fasteners.
 - B. Glazing: As specified in Section 08.8000.
 - C. Removable Stops: Formed sheet steel, shape as indicated on drawings, butted corners; prepared for countersink style tamper proof screws.
 - D. Grout for Frames: Portland cement grout with maximum 4 inch (102 mm) slump for hand troweling; thinner pumpable grout is prohibited.
 - E. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
 - F. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

- 1. EXAMINATION
 - A. Verify existing conditions before starting work.
 - B. Verify that opening sizes and tolerances are acceptable.
 - C. Verify that finished walls are in plane to ensure proper door alignment.
- 2. INSTALLATION
 - A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
 - B. Install fire rated units in accordance with NFPA 80.
 - C. Coordinate frame anchor placement with wall construction.
 - D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
 - E. Install door hardware as specified in Section 08.7100.

- F. Comply with glazing installation requirements of Section 08.8000.
 - G. Coordinate installation of electrical connections to electrical hardware items if provided.
 - H. Touch up damaged factory finishes.
3. TOLERANCES
- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
 - B. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.
4. ADJUSTING
- A. Adjust for smooth and balanced door movement.
 - B. Adjust sound control doors so that seals are fully engaged when door is closed.
 - C. Test sound control doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

END OF SECTION

Access Doors and Panels

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Floor access door and frame units, interior and exterior.
2. RELATED REQUIREMENTS
 - A. Section 09.9113 - Exterior Painting: Field paint finish.
 - B. Section 09.9123 - Interior Painting: Field paint finish.
3. 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.
 - C. Shop Drawings: Indicate exact position of each access door and/or panel unit.
 - D. Manufacturer's Installation Instructions: Indicate installation requirements.
 - E. Project Record Documents: Record actual locations of each access unit.
4. QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
 - B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

PART 2 PRODUCTS

1. ACCESS DOORS AND PANELS ASSEMBLIES
2. FLOOR ACCESS UNITS
 - A. Manufacturers:
 1. Bilco Company: www.bilco.com/sle
 - a. Basis of Design: Type TER Architectural Flooring Floor Access Door by The Bilco Company
 2. Substitutions: See Section 01.6000 - Product Requirements.
 - B. Furnish and install where indicated on Drawings. The door access door shall be single leaf and pre-assembled from the manufacturer.
 - C. Performance Characteristics:
 1. Cover: Shall be reinforced to support a minimum load of 150 psf with maximum deflection of 1/150th of the span
 2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of the opening and closing.
 3. Operation of the cover shall not be affected by temperature.
 - D. Cover shall have a 1" (25mm) fillable pan to receive concrete or a combination of concrete and surrounding floor finish. All fill material to be furnished and installed by others in the field.
 - E. Frame: Shall be extruded aluminum with full anchor flange around the perimeter.
 - F. Lifting Mechanisms: Manuf. shall provide the required number and size of compression spring operators enclosed in telescopic tubes to provide smooth, easy, and controlled cover operation throughout the entire arc of opening and to act as a check in retarding downward motion of the cover when closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tubes shall interlock with a flanged support shoe fastened to a formed 1/4" (6mm) gusset support plate.
 - G. A removable exterior turn/lift handle with a spring loaded ball dent shall be provided to open and the latch release shall be protected by a flush, gasketed, removable screw plug.

H. Hardware:

1. Hinges: Shall be continuous heavy duty Type 316 stainless steel hinge that is accessible only when the cover is in the open position.
2. Cover shall be equipped with an aluminum hold open arm that automatically locks the cover in the open position.
3. Cover shall be fitted with the required number and size of compression spring operators.
4. A Type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of the cover.
5. Hardware: Compression spring tubes shall be an anti-corrosive composite, all fasteners shall be Type 316 stainless steel material, and all other hardware shall be zinc plated and chromate sealed.
6. Finishes: Factory finish shall be mill finish aluminum with bituminous coating applied to the exterior of the frame.

PART 3 EXECUTION

1. EXAMINATION

- A. Verify that rough openings are correctly sized and located.
- B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

2. PREPARATION

- A. Clean surfaces thoroughly prior to proceeding with this work.
- B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3. INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Protect metal surfaces exposed to view and all hardware during concrete pouring and finishing.
- C. Install frames plumb and level in openings, and secure units rigidly in place.
- D. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION

Aluminum-Framed Storefronts

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Infill panels of metal and glass.
 - B. Aluminum doors and frames.
 - C. Weatherstripping.
 - D. Door hardware.
2. RELATED REQUIREMENTS
 - A. Section 08.4229 - Automatic Entrances.
 - B. Section 08.4413 - Glazed Aluminum Curtain Walls.
 - C. Section 08.7100 - Door Hardware: Hardware items other than specified in this section.
3. REFERENCE STANDARDS
 - A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.
 - B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.
 - C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
 - D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
 - E. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
4. ADMINISTRATIVE REQUIREMENTS
 - A. Coordinate with installation of other components that comprise the exterior enclosure.
 - B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.
5. SUBMITTALS
 - A. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details and any other items listed in this section or required for a complete installation.
 - B. Shop Drawings: Provide plans, elevations, sections, details and attachments to other work. Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, drainage requirements and field welding required.
 - C. Samples: Submit two samples 12 by 12 inches (305 by 305 mm) in size illustrating finished aluminum surface, glass, infill panels, glazing materials.
 - D. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
 - E. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
 - F. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
 - G. Installer Qualifications Statement.
 - H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
6. QUALITY ASSURANCE
 - A. Source Control: Provide all items from a single manufacturer.
 - B. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

- C. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least ten years of documented experience.
 - D. Installer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.
7. DELIVERY, STORAGE, AND HANDLING
- A. Handle products of this section in accordance with AAMA CW-10.
 - B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.
 - C. Place products on a minimum 4 inch wood blocking and cover.
 - D. Do not use non-vented plastic or canvas that could create a humidity chamber.
8. FIELD CONDITIONS
- A. Verify actual locations of structural supports and field measurements prior to fabrication.
 - B. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.
9. WARRANTY
- A. Correct defective Work within a two year period after Date of Substantial Completion. Warranty to be backed by the manufacturer for the repair or replacement of components of aluminum-framed systems that do not comply with requirements of that t fail in materials or workmanship within specified warranty period. Failures included, but are not limited to the following:
 - 1. Structural failures.
 - 2. Excessive deflection.
 - 3. Noise or vibrations caused by thermal movement.
 - 4. Deterioration of metals and other materials.
 - 5. Adhesive or cohesive sealant failures.
 - 6. Water leakage through fixed glazing and framing.
 - 7. Failure of operating components.
 - B. Provide 20 year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

1. BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING
- A. Center-Set Style, Thermally-Broken:
 - 1. Basis of Design: Kawneer, an Arconic Company; Trifab Series 451T: www.kawneer.com.
 - 2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep (50 mm wide by 114 mm deep).
 - B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
 - 1. EFCO, a Pella Company: www.efcocorp.com/sle.
 - 2. YKK AP America Inc: www.ykkap.com.
 - C. Substitutions: See Section 01.6000 - Product Requirements.
2. BASIS OF DESIGN -- SWINGING DOORS
- A. Narrow Stile, Insulating Glazing, Thermally-Broken:
 - 1. Basis of Design: Kawneer, an Arconic Company; 190 Narrow Stile Entrance.
 - 2. Thickness: 1-3/4 inches (43 mm).
 - 3. Stiles and Rails: 2-1/8 inches (54 mm) Stiles, 2-1/4 inches (57 mm) Top Rail, 3-7/8 inches (98 mm) Bottom Rail.
 - B. Medium Stile, Insulating Glazing, Thermally-Broken:

1. Basis of Design: Kawneer, an Arconic Company; 350 Medium Stile Entrance.
 2. Thickness: 1-3/4 inches (43 mm).
 3. Stiles and Rails: 3-1/2 inches (89 mm) Stiles and Top Rail, 6-1/2 inches (165 mm) Bottom Rail.
 - C. Wide Stile, Insulating Glazing, Thermally-Broken:
 1. Basis of Design: Kawneer, an Arconic Company; 500 Wide Stile Entrance.
 2. Thickness: 1-3/4 inches (43 mm).
 3. Stiles and Rails: 5 inches (127 mm) Stiles and Top Rail, 6-1/2 inches (165 mm) Bottom Rail.
 - D. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
 1. EFCO, a Pella Company: www.efcocorp.com/sle.
 2. YKK AP America Inc: www.ykkap.com.
 - E. Substitutions: See Section 01.6000 - Product Requirements.
 1. For any product not identified as "Basis of Design", submit information as specified for substitutions.
3. COMPONENTS
- A. Glazing: As specified in Section 08.8000.
 - B. Swing Doors: Glazed aluminum.
 1. Thickness: 1-3/4 inches (43 mm).
 2. Stiles and Rails: As specified above.
 3. Glazing Stops: Square.
 4. Finish: Same as storefront.
 - C. Operable Sash: Aluminum project-out awning; finished to match storefront; turn handle latch with manufacturer's standard insect screen.
4. MATERIALS
- A. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
 - B. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.
 - C. Structural Supporting Anchors Attached to Reinforced Concrete Members: Design for welded attachment to weld plates embedded in concrete.
 - D. Exposed Flashings: Aluminum sheet, 20 gage, 0.032 inch (0.81 mm) minimum thickness; finish to match framing members.
 - E. Sealant for Setting Thresholds: Non-curing butyl type.
 - F. Glazing Accessories: As specified in Section 08.8000.
 - G. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.
5. FINISHES
- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.
 - B. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils (0.018 mm) thick.
 - C. High Performance Organic Coatings: AAMA 2604; multiple coats, thermally cured fluoropolymer system.
 - D. Color: As selected by Architect from manufacturer's standard range.
 - E. Touch-Up Materials: As recommended by coating manufacturer for field application.
6. HARDWARE
- A. For each door, include weatherstripping, sill sweep strip, and threshold.

- B. Weatherstripping: tubular shaped thermoplastic elastomer pile with semi-regid polymeric backing, continuous and replaceable; provide on all doors.
- C. Sill Sweep Strips: Resilient seal type,Gasket Sweep Strip of EPDM in aluminum extrusion applied to interior exposed surface on bottom rail with concealed fasteners; provide on all doors.
- D. Threshold: Extruded aluminum with anodized finish, one piece per door opening, ribbed surface, ADA compliant; provide on all doors.
- E. Pivots: Offset type; top, intermediate, and bottom. Finish to be No. 40 Bronze.
- F. Push/Pull Set: Standard configuration push/pull handles.
- G. Exit Devices: Panic type, Paneline concealed rod exit device with Panic Guard.
- H. Door Closers: Exposed overhead.
- I. Locks: keyed cylinder inside; keyed cylinder outside.
 - 1. Provide on doors as indicated.
- J. Automatic Door Operators and Actuators: As specified in Section 08.4229.

PART 3 EXECUTION

1. EXAMINATION
 - A. Verify dimensions, tolerances, and method of attachment with other work.
2. INSTALLATION
 - A. Install wall system in accordance with manufacturer's instructions.
 - B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
 - C. Provide alignment attachments and shims to permanently fasten system to building structure.
 - D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
 - E. Provide thermal isolation where components penetrate or disrupt building insulation.
 - F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
 - G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
 - H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
 - I. Install operating sash.
 - J. Set thresholds in bed of sealant and secure.
 - K. Install hardware using templates provided.
 - 1. See Section 08.7100 for hardware installation requirements.
 - L. Install glass and infill panels in accordance with Section 08.8000, using glazing method required to achieve performance criteria.
 - M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
3. TOLERANCES
 - A. Maximum Variation from Plumb: 0.06 inch per 3 feet (1.5 mm per m) non-cumulative or 0.06 inch per 10 feet (1.5 mm per 3 m), whichever is less.
 - B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).
4. ADJUSTING
 - A. Adjust operating hardware and sash for smooth operation.
5. CLEANING
 - A. Remove protective material from pre-finished aluminum surfaces.

SECTION 087100 - DOOR HARDWARE

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. Furnish labor, materials, tools and other equipment, and services necessary to provide commercial door hardware to the full extent of the Drawings and Specifications, including all accessory items required for a complete installation. Following are types of door hardware normally associated with this Section. Not all of these hardware types may apply to this Project nor are they being represented as being all inclusive of every type of hardware specified herein.

1. Swinging doors.
2. Storefront and entrance doors.
3. Non-fire-rated sliding doors.
4. Non-fire-rated folding doors.
5. Electrified doors.
6. Cylinders for custom and manufactured wood casework doors and drawers fabricated with locking hardware.
7. Cylinders for doors specified in other Sections.
8. Other door hardware to the extent indicated and/or required by actual conditions.
9. Key cabinets, key management software.

- B. Refer to Drawings and Schedules (e.g., Door Schedule) for type, location and extent of door hardware required, including all items necessary to complete work shown, scheduled or specified.

1.3 RELATED SECTIONS

- A. Following are related Sections that contain additional Contractor requirements. Not all of these listed Sections may apply to this Project nor are they being represented as being all inclusive of every related Section possibly associated with this Section.

1. SECTION 017900 - DEMONSTRATION AND TRAINING for requirements to train Owner's maintenance personnel to adjust, operate, and maintain door hardware.
2. SECTION 079200 - JOINT SEALANTS for setting exterior and acoustical door thresholds in sealant.
3. SECTION 081113 - HOLLOW METAL DOORS AND FRAMES for door and frame preparation, reinforcement, and door silencers provided as part of hollow-metal doors and frames. Section 081113 also includes astragals provided as part of fire-rated labeled assemblies.
4. SECTION 081119 - STAINLESS-STEEL DOORS AND FRAMES for door and frame preparation, reinforcement, and door silencers provided as part of hollow-metal doors and frames manufactured according to Hollow Metal Manufacturers Association standards. Section 081119 also includes astragals provided as part of fire-rated labeled assemblies.

5. SECTION 081416 - FLUSH WOOD DOORS for factory prefabrication and machining of wood doors for door hardware. Section 081416 also includes astragals and integral intumescent seals provided as part of fire-rated labeled assemblies.
6. SECTION 081700 – INTEGRATED OPENINGS
7. SECTION 083113 - ACCESS DOORS AND FRAMES for hinges, latches, and automatic closers provided as part of access door package. Locks and cylinders may be specified in Section 083113 or Section 087100.
8. SECTION 083323 - OVERHEAD COILING DOORS for smoke seals, weather seals, and push-pull handles provided as part of overhead coiling door assemblies.
9. SECTION 083326 - OVERHEAD COILING GRILLES for push-pull handles provided as part of overhead coiling grille assemblies.
10. SECTION 083473 - SOUND CONTROL DOOR ASSEMBLIES for door and frame preparation, reinforcement, and door gasketing provided as part of sound-rated door assemblies.
11. SECTION 083513 - FOLDING DOORS for pulls, latches, hinges, guides, and pivots provided as part of the folding door package.
12. SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS for entrance door hardware including hinges, thresholds, weatherstripping, door sweeps, and silencers provided as part of the door package.
13. SECTION 084126 - ALL-GLASS ENTRANCES AND STOREFRONTS for entrance door hardware including thresholds, weatherstripping, door sweeps, and silencers provided as part of the door package.
14. SECTION 084229 - AUTOMATIC ENTRANCES for entrance door hardware including hinges, dustproof strikes, thresholds, weatherstripping, door sweeps, and motorized operators provided as part of the door package. Lock cylinders are specified in Section 087100.
15. SECTION 084243 - INTENSIVE CARE UNIT / CRITICAL CARE UNIT (ICU/CCU) ENTRANCES for entrance door hardware including pulls, flush bolts, deadlocks, and sound stripping provided as part of the door package. Lock cylinders are specified in Section 087100.
16. SECTION 087113 - AUTOMATIC DOOR OPERATORS for low-energy power operators and low-energy power-open operators.
17. SECTION 102213 - WIRE MESH PARTITIONS for door hardware for doors in wire mesh partitions, including hinges, locks, and bolts provided as part of the wire mesh door package. Lock cylinders are specified in Section 087100.
18. SECTION 102600 - WALL AND DOOR PROTECTION for plastic door protection units that match wall protection units.
19. SECTION 133419 - METAL BUILDING SYSTEMS for door hardware, including hinges, thresholds, weatherstripping, door sweeps, and silencers, provided as part of the metal building system. Lock cylinders are specified in Section 087100.
20. SECTION 134900 - RADIATION PROTECTION for door and frame preparation and reinforcement provided as part of lead-lined doors and frames. Section 134900 also includes lead-lined astragals provided as part of fire-rated labeled assemblies.
21. Division 26 Sections for connections to electrical power system and for low-voltage wiring work.
22. SECTION 28513 – SAFETY AND SECURITY for connections to the building safety and security system.
23. SECTION 281300 - ACCESS CONTROL for access control devices installed at door openings, such as card readers, and provided as part of a security access system.
24. SECTION 281600 - INTRUSION DETECTION for detection devices installed at door openings and provided as part of an intrusion detection system.
25. SECTION 283111 – DIGITAL, ADDRESSABLE FIRE ALARM SYSTEM for connections to the building fire alarm system.

1.4 REFERENCE STANDARDS

A. Following are reference standards normally associated with this Section. All of these Standards may not apply to this Project nor are they being represented as being all inclusive of every reference standard associated with this Section. Refer to Division 00 Section "000800 – SUPPLEMENTARY CONDITIONS," Article 1, concerning version of Standards referenced.

1. American Architectural Manufacturers Association
 - a. AAMA 701/702-2000: Voluntary Specifications for Pile Weatherstripping and Replaceable Fenestration Weather seals
2. American National Standards Institute
 - a. ANSI 156.18: Materials and Finishes
 - b. ANSI A117.1-1998: Accessible and Usable Buildings and Facilities (CABO)
 - c. ANSI A250.6-1997: Hardware for Standard Steel Doors (Reinforcement - Application)
3. ASTM International
 - a. ASTM E 283-91 (Reapproved 1999): Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen
 - b. ASTM E 1408-00: Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems
4. Builders Hardware Manufacturers Association
 - a. BHMA A156.1-2000: Butts and Hinges (ANSI)
 - b. BHMA A156.2-1996: Bored and Preassembled Locks & Latches (ANSI)
 - c. BHMA A156.3-2001: Exit Devices (ANSI)
 - d. BHMA A156.4-2000: Door Controls - Closers (ANSI)
 - e. BHMA A156.5-2001: Auxiliary Locks and Associated Products (ANSI)
 - f. BHMA A156.6-2001: Architectural Door Trim (ANSI)
 - g. BHMA A156.7-2003: Template Hinge Dimensions (ANSI)
 - h. BHMA A156.8-2000: Door Controls - Overhead Stops and Holders (ANSI)
 - i. BHMA A156.12-1999: Interconnected Locks (ANSI)
 - j. BHMA A156.13-2001: Mortise Locks & Latches Series 1000 (ANSI)
 - k. BHMA A156.14-1997: Sliding & Folding Door Hardware (ANSI)
 - l. BHMA A156.15-1997: Release Devices - Closer Holder, Electromagnetic and Electromechanical (ANSI)
 - m. BHMA A156.16-1997: Auxiliary Hardware (ANSI)
 - n. BHMA A156.17-1999: Self Closing Hinges and Pivots (ANSI)
 - o. BHMA A156.18-2000: Materials and Finishes (ANSI)
 - p. BHMA A156.21-1996: Thresholds (ANSI)
 - q. BHMA A156.22-2003: Door Gasketing and Edge Seal Systems (ANSI)
 - r. BHMA A156.23-1999: Electromagnetic Locks (ANSI)
 - s. BHMA A156.24-1999: Delayed Egress Locks (ANSI)
 - t. BHMA A156.25-2002: Electrified Locking Devices (ANSI)
 - u. BHMA A156.26-2000: Continuous Hinges (ANSI)
 - v. BHMA A156.28-2000: Recommended Practices for Keying Systems (ANSI)
 - w. BHMA A156.29-2001: Exit Locks, Exit Locks with Alarms, Exit Alarms, Alarms for Exit Devices (ANSI)
 - x. BHMA A156.30-2003: High Security Cylinders (ANSI)
 - y. BHMA A156.31-2001: Electric Strikes and Frame Mounted Actuators (ANSI)
 - z. Certified Product Directory. 2002.
5. Door and Hardware Institute

- a. DHI A115 Series: Specifications for Steel Door and Frame Preparation for Hardware (ANSI)
 - b. DHI A115-W Series: Wood Door Hardware Standards - Hardware Preparation (ANSI)
 - c. DHI WDHS.2-96: Recommended Fasteners for Wood Doors
 - d. DHI WDHS.3-96: Recommended Locations for Architectural Hardware for Wood Flush Doors
6. Federal Government
- a. U.S. Architectural & Transportation Barriers Compliance Board. Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG). Adopted in 1991; continual revisions.
7. Federal Standard
- a. FED-STD-795-1989 (Revised 1998): Uniform Federal Accessibility Standards
8. International Conference of Building Officials
- a. UBC Standard 7-2-1997: Fire Tests of Door Assemblies
9. National Electrical Manufacturers Association
- a. NEMA ICS 6-93: Industrial Control and Systems: Enclosures
 - b. NEMA LD 3-95: High Pressure Decorative Laminates
10. NFPA
- a. NFPA 80-99: Fire Doors and Fire Windows
 - b. NFPA 105-99: Recommended Practice for the Installation of Smoke-Control Door Assemblies
 - c. NFPA 252-99: Methods of Fire Tests of Door Assemblies
11. Underwriters Laboratories Inc.
- a. UL10C: Fire Tests of Door Assemblies (Positive Pressure)
 - b. UL 305-97: Panic Hardware
 - c. UL 437-00: Key Locks
 - d. UL 1784-01: Air Leakage Tests for Door Assemblies
12. Project specific federal, state and local codes, guidelines, regulations and standards adopted in the immediate geographic area of the Project, including Authorities having Jurisdiction.

1.5 SUBMITTALS

- A. Certification of Compliance: Submit all information necessary to indicate full compliance to all requirements specified herein, otherwise, submittal will be returned marked 'Rejected.'
- B. Submit in accordance with the requirements specified in Division 01 Section "013300 – SUBMITTAL PROCEDURES."
- C. Action Submittals:
 - 1. Product Schedule: Descriptive list of all materials proposed for use as described in Division 01 Section "013300 – SUBMITTAL PROCEDURES."
 - 2. Manufacturer's Product Data: Submit manufacturer's technical product data for each item of hardware. Include material descriptions, product test reports, construction and

- installation details, mounting locations, dimensions of individual components and profiles, finishes, and maintenance instructions for all operating parts and finish.
3. Shop Drawings: If electrified door hardware is required as part of this Project, provide details including:
 - a. Wiring diagrams: Indicate power, signal, and control wiring, including system schematics, point-to-point wiring diagram, riser diagram, and elevation of each door.
 - b. Detail interface between electrified door hardware and fire alarm, access control, security, building control system, and related door devices specified in other Sections for each door and frame.
 - c. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.
 4. Samples for Verification: Architect reserves the right to request hardware samples for verification of finish on exposed door hardware. If requested:
 - a. Tag with full description for coordination with the door hardware sets.
 - b. Submit samples before, or concurrent with, submission of the final door hardware sets.
 5. Door Hardware Sets: Prepared by, or under the supervision of, supplier's architectural hardware consultant (AHC), coordinating the final door hardware sets, including any electrified door hardware items, with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - a. Sets Schedule shall be prepared or reviewed prior to submission by a certified Architectural Hardware Consultant, who shall affix his or her seal attesting to the completeness and correctness of the Schedule.
 - b. Check specified hardware for suitability and adaptability to details and surrounding conditions. Indicate unsuitable or incompatible items in Sets Schedule. For substitutions, refer to Division 00 Section "016000 – PRODUCT REQUIREMENTS."
 - c. Format: Use same scheduling sequence, format and use same door numbers as in the Contract Documents.
 - d. Content: Include the following information:
 - 1) Identification number, location, hand, fire rating and material of each door and frame.
 - 2) Type, style, function, size, quantity, and finish of each door hardware item. Include description and function of each lockset and exit device.
 - 3) Complete designations of every item required for each door or opening including name and manufacturer.
 - 4) Fastenings and other pertinent information.
 - 5) Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - 6) Explanation of abbreviations, symbols, and codes contained in schedule.
 - 7) Mounting locations for door hardware.
 - 8) Provide listing of manufacturer's template numbers for each item of hardware in hardware schedule.
 - 9) Door and frame sizes and materials.
 - 10) If electrified door hardware is specified for this Project, provide description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
 - a) Sequence of Operation: Include description of component functions that occur in the following situations: authorized person wants to enter; authorized person wants to exit; unauthorized person wants to enter; unauthorized person wants to exit.

11) List of related door devices specified in other Sections for each door and frame.

e. Submittal Sequence: Submit final Door Hardware Sets Schedule at earliest possible date particularly where acceptance of Schedule must precede fabrication of other work, i.e. hollow metal doors and frames, aluminum doors and frames, wood doors, etc., that is critical in the Project Construction Schedule. Include with Sets Schedule all product data, samples, shop drawings of any electrified door hardware, and other information essential to the coordinated review of the door hardware sets.

6. Keying Schedule: Prepared by or under the supervision of the Architectural Hardware Consultant detailing clearly the Owner's final keying instructions for locks. Include schematic keying diagram with each key set indexed to unique door designations.

D. Informational Submittals:

1. Provide list of all hardware manufacturers used and their nearest representative to the Project site with their address and phone numbers.
2. Product Certificates: If electrified door hardware is specified for this Project, provide certificates signed by product manufacturer certifying that each electrified door hardware item approved for use on types and sizes of labeled fire doors complies with listed fire door assemblies as required.
3. Qualification Data: For installer of door hardware, including any electrified door hardware, signed by product manufacturer / supplier, certifying installer is approved, authorized, and/or certified by manufacturer / supplier to install finish hardware.
4. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for locks, latches, delayed-egress locks, and closers.
5. Maintenance Data: For each type of door hardware to include in maintenance manuals.
6. Warranty: Sample copy of Manufacturer's special warranty specified in "Warranty" Article below.
7. Operating And Maintenance Manuals: In addition to requirements of Division 00 Section "017700 – CLOSEOUT PROCEDURES," submit 3 sets of manuals containing the following:
 - a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Parts list for each product.
 - d. Name, address, and phone number of local representative for each manufacturer.
 - e. Copy of final / reviewed Door Hardware Set Schedule, edited to reflect "As Installed."
 - f. Copy of final Keying Schedule.
 - g. Wiring Diagrams for each opening connected to power, both low voltage and 110 volts, edited to reflect "As Installed."
 - h. One complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders. Refer to "Maintenance Service" Article in Part 1 of this Section.

1.6 QUALITY ASSURANCE

- A. For Manufacturer, Supplier, Professional Engineer, Specialist, Installer, and Factory-Authorized Service Representative minimum qualifications, refer to Specification Division 01 Section "014000 – QUALITY REQUIREMENTS."

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- B. Additional Installer Qualifications: An employer of skilled tradesmen trained and approved by hardware manufacturer, each of whom must possess a minimum of three (3) years experience in successfully installing same or similar hardware to that required for this project.
- C. Additional Supplier Qualifications: A distributor who has been providing door hardware for a period of not less than five (5) years. The distributor shall be, or employ, a certified Architectural Hardware Consultant (AHC), who is registered in the continuing education program as administered by the Door and Hardware Institute.
- D. Architectural Hardware Consultant Qualifications: A person who is currently certified by DHI as an Architectural Hardware Consultant (AHC), and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
 - 1. Electrified Door Hardware Consultant Qualifications: A qualified Architectural Hardware Consultant who is experienced in providing consulting services for electrified door hardware installations, if such hardware is specified for this Project.
- E. Architectural Door Hardware Consultant Requirements: Must be available, at reasonable times during the course of the Work, for consultation relative to project's door hardware requirements, with Owner, Architect and/or Contractor; responsible for detailing, scheduling and ordering of finish hardware; consult and prepare, with the Owner's involvement, Keying Schedule.
 - 1. Electrified Door Hardware Consultant Requirements: Same as for Architectural Hardware Consultant, but relative to electrified door hardware.
- F. Professional Engineer Requirements: If electrified door hardware is specified for this Project, prepare product data and shop drawings, including operation narrative for all electrified door hardware, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated.
- G. Fire Rated Door Assemblies: Assemblies complying with NFPA 80, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252, UBC Standard 7-2, or UL10C for given type / size opening and degree of label. Provide proper latching hardware, non-flaming door closers, approved-bearing hinges, plus resilient and required intumescent seals. Where UL requirements conflict with drawings or specifications, hardware conforming to UL requirements shall be provided. Conflicts and proposed substitutions shall be clearly indicated in Hardware Set Schedule. Furnish openings complete.
 - 1. Note: Scheduled seals may exceed selected door manufacturer's requirements. Refer to "Door Seals" Article in Part 2 of this Section for clarification.
- H. Electrified Door Hardware: If any is specified for this Project, such hardware must be listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to Authorities Having Jurisdiction, and marked for intended use.
- I. Source Limitations:
 - 1. Obtain each type and variety of door hardware from a single manufacturer, although several may be indicated as offering products complying with requirements.
 - 2. Provide electrified door hardware, if any is specified for this Project, from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to Authorities Having Jurisdiction are acceptable.

- J. All door hardware, including any electrified door hardware specified for this Project, shall be new; free of defects, blemishes and excessive play, and shall comply with requirements of Americans with Disabilities Act (ADA).
- K. Preinstallation Conference: Conduct conference at Project site prior to commencement of field installation to comply with requirements in Division 01 Section "013100 - PROJECT MANAGEMENT AND COORDINATION." to discuss installation requirements, issues and procedures; establish procedures to maintain required working conditions; and to coordinate Work with related and adjacent Work. Owner's representatives, Contractor, Architect, supplier's AHC, installer and related trades should be present.
 - 1. Review methods and procedures related to any electrified door hardware that may be specified for this Project, including, but not limited to, the following:
 - a. Discuss manufacturer's installation instructions and recommendations for locks, closers and exit devices.
 - b. Coordinate materials and techniques.
 - c. Discuss sequence of complex hardware items and systems installation, including electrified door hardware if specified for this project.
 - d. Inspect and discuss electrical roughing-in and other preparatory work performed by other trades.
 - e. Review sequence of operation for each type of electrified door hardware.
 - f. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - g. Review required testing, inspecting, and certifying procedures.
- L. Keying Conference: Conduct conference at location designated by the Owner to comply with requirements in Division 01 Section "013100 - PROJECT MANAGEMENT AND COORDINATION." Participants should include Owner's representatives, Contractor, Architect, and Installer's Architectural Hardware Consultant. Incorporate keying conference decisions into final Keying Schedule after reviewing door hardware keying system including, but not limited to, the following:
 - 1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - 2. Preliminary key system schematic diagram.
 - 3. Requirements for key control system.
 - 4. Address for delivery of keys.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hardware to jobsite in manufacturer's original packaging, complete with basic installation instructions, templates, necessary fasteners and related pieces. Each item or package shall be clearly marked or tagged separately to indicate contents, locations in Hardware Sets Schedule and door numbers. Check hardware against reviewed hardware schedule.
- B. Deliver hardware required to be installed during fabrication of hollow metal, aluminum, wood, or stainless steel doors prepaid to manufacturer.
- C. Storage: Do not deliver hardware to Project site until Contractor provides suitable locked storage space and controlled access to same to protect against loss, theft or damage.

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1.8 PROJECT CONDITIONS

- A. Where exact types of specified hardware, including any electrified door hardware that may be specified for this Project, are not adaptable to finished shape or size of members requiring hardware, provide suitable types having as nearly as practical as the same operation and quality as type specified, subject to Architect's approval.

1.9 COORDINATION

- A. Templates: Distribute door hardware templates and reviewed "Door Hardware Set Schedule" to door and frame manufacturers / suppliers and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing. Comply with procedures established in ASACH-NBHA Handbook for "Recommended Procedures for Processing Hardware Schedules and Templates." Check shop drawings of other work, to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- B. Electrical System Roughing-in: If any electrified door hardware is specified for this Project, coordinate hardware layout and installation of conduit and raceways as needed for such hardware. Coordinate electrified door hardware with connections to power supplies, fire alarm system and detection devices, access control system, security system, and/or building control system.
- C. Where new hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide for proper operation. If any conflict or discrepancy between the scheduled material and existing conditions, submit request for directions from Architect.
- D. If recessed pivots and closers are specified for this Project, coordinate layout and installation with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- E. Coordinate floor-mounted hardware with finish floor materials.
- F. Confirm that door manufacturers furnish necessary UBC-7-2 compliant seal packages.

1.10 WARRANTY

- A. As part of respective manufacturers' regular terms of sale, provide manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, structural failures including excessive deflection, cracking, or breakage; faulty operation of operators and door hardware; deterioration of metals, metal finishes, and other materials beyond normal weathering and use. All warranties commence on date of Substantial Completion.

- | | |
|--------------------------------|--|
| 1. Closers: | Ten years mechanical,
Two-years electrical. |
| 2. Exit Devices: | Five-years. |
| 3. Electromagnetic Locks | Lifetime |
| 4. Mortise Locksets Grade One: | Ten-years. |

1.11 COMMISSIONING

- A. Confirm proper door hardware operation with any smoke control system or stairwell pressurization systems, both at rest and while in full operation.
- B. Confirm satisfactory operation of electrical, electronic and/or electro-pneumatic hardware systems.
- C. Confirm that hardware interfaced with fire / life-safety and security systems provides for proper operation and release.

1.12 MAINTENANCE SERVICE

- A. **Maintenance Service:** As part of Contractor's standard one-year warranty, provide full maintenance by skilled employees of door hardware Supplier / Installer. Toward the end of eleven (11) month time period immediately following date of Substantial Completion, provide preventive maintenance inspection of all hardware, including repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door hardware operation. Provide parts and supplies same as those used in the manufacture and installation of original products. Prepare and submit written report to Owner identifying current problems and likely future problems.
- B. **Maintenance Tools and Instructions:** At completion of maintenance period, furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware. Train Owner's maintenance personnel to adjust, operate, remove and replace, and maintain door hardware and hardware finishes, including same for any electrified door hardware if specified for this Project. Refer to Division 01 Section "017900 - DEMONSTRATION AND TRAINING."

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Provide hardware items, articles, materials, operations, methods, and finish listed, scheduled, or mentioned herein or on drawings, and in adequate quantities required to complete Work in accordance with these specifications and manufacturers' written instructions.
 - 1. Include all items of hardware required for hardware systems to function properly that may be inadvertently omitted from the Contract Documents. Note these items in submittal for review.
 - 2. Prior to ordering hardware, advise Architect of items that will not operate properly, are improper for conditions, will not remain permanently anchored, or conflict with any governing regulations.
- B. Where scheduled item is now obsolete and/or discontinued, bid and submit manufacturers updated item at no additional cost to the Owner. Note these items in submittal for review.
- C. All exit doors are to be operable for egress with single motion and without the use of a key or special knowledge or effort.
- D. **Handicapped Requirements:** Doors to stairs (other than exit stairs), loading platforms, boiler rooms, mechanical rooms, electrical rooms, stages and doors serving other hazardous locations

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shall have knurled or other similar approved marking of door lever handles or cross bars in accordance with all applicable federal, state and local guidelines, codes and standards adopted in the immediate geographic area of the Project.

- E. Accessibility Requirements: Where door handles, pulls, latches, locks, control devices, and other operating devices are indicated to comply with accessibility requirements, comply with all applicable federal, state and local guidelines, codes and standards adopted in the immediate geographic area of the Project, including the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act" (ADA), "Accessibility Guidelines for Buildings and Facilities" (ADAAG)," ANSI A117.1, and FED-STD-795, "Uniform Federal Accessibility Standards."
 - 1. Unless otherwise indicated or required, provide operating devices and other door hardware that comply with the following:
 - a. Locks, Latches, Handles and Pulls: Not requiring tight grasping, pinching, or twisting of the wrist and that operate with a force of 5-lbf. or less.
 - b. Exterior, Non-Fire-Rated Hinged Doors: 8.5-lbf applied perpendicular to door.
 - c. Interior, Non-Fire-Rated Hinged Doors: 5-lbf applied perpendicular to door.
 - d. Labeled Fire Doors: 15-lbf applied perpendicular to door, or minimum opening force allowable by authorities having jurisdiction.
 - e. Sliding or Folding Doors: 5-lbf applied parallel to door at latch.
 - f. Thresholds: Bevel raised thresholds with a slope of not more than 1:2; maximum 1/2-inch high, 3/4-inch high for exterior sliding doors.
- F. Means of Egress Requirements: Comply with NFPA 101.
 - 1. Locks: Locks shall not require use of a key, tool, or special knowledge for operation.
 - 2. Latches: Latches shall not require more than 15-lbf to release the latch.
 - 3. Closers: Door closers shall not require more than 30-lbf to set door in motion and not more than 15-lbf to open door to minimum required width.
 - 4. Exit Devices: Exit devices shall not require more than 15-lbf to release the latch.
 - 5. Thresholds: Maximum 1/2-inch in overall height.

2.2 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in this Section, and door hardware sets indicated in the "Door Schedule" and in Part 3 of this Section – "Door Hardware Sets Schedule."
 - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
 - 2. Sequence of Operation: If any electrified door hardware is specified for this Project, provide function, sequence of operation, and interface with other building control systems indicated.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 of this Section – "Door Hardware Sets" Article. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 2 of this Section – "Manufacturers of Scheduled Hardware" Article.

C. In other Part 2 Articles where titles below introduce lists, the following requirements apply to product selection:

1. Basis-of-Design Product: Specifications are based upon product manufactured by manufacturer specified.

2.3 MANUFACTURERS OF SCHEDULED HARDWARE

A. Listed acceptable and acceptable alternate manufacturers: Submit for review products with equivalent function and features of scheduled products.

<u>ITEM:</u>	<u>MANUFACTURER:</u>
Mortise Locks & Latchsets	Corbin Russwin, Yale
Tubular Latchsets	Corbin Russwin, Yale
Cylinders	MEDECO
Exit Devices	Corbin Russwin
Closers	Corbin Russwin
<u>Hanging Devices:</u>	
Butt Hinges	McKinney
Swing-Clear Hinges	McKinney
Continuous Hinges	McKinney
Pivots	Rixson
Pivot Set	Rixson
<u>Securing Devices (Inactive leaf):</u>	
Manual Flush Bolt	Rockwood
Semi-Auto Flush Bolts	Rockwood
Auto Flush Bolts	Rockwood
<u>Securing Devices (Active leaf):</u>	
Aluminum Door Locks	Adams Rite
Push / Pull Latch	
<u>Operating Trim:</u>	
Off-Set Door Pull	Rockwood
Push Bar	Rockwood
Push & Pull Plates	Rockwood
<u>Accessories for Pairs of Doors:</u>	
Coordinator	McKinney
Astragal	McKinney
Carry-Open Bars	
<u>Closing Devices:</u>	
Surface Closers / with Stops	Corbin Russwin
Concealed Overhead Closers	Rixson
Concealed Floor Closers	Rixson

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Auto-Equalizer Low Energy (BES) Besam Stanley, Horton
 For openings meeting ANSI 156.19 standards for Low Energy and Power Assist Automatic Pe-
 destrian Doors (Low energy operators).

Protective trim:

Metal Protective Trim Units	(RO) Rockwood	McKinney ,Trimco
Door Edge Guards	(RO) Rockwood	McKinney ,Trimco

Stops and Holders:

Wall Stops	(RO) Rockwood	McKinney ,Trimco
Dome Stop w/ Riser	(RO) Rockwood	McKinney ,Trimco
Stops and Holders	(RO) Rockwood	McKinney ,Trimco
Overhead Stops / Holders	(RIX) Rixson	

Accessories:

Thresholds	(PE) Pemko	McKinney, Reese,
Seals	(PE) Pemko	McKinney, Reese,
Drop Seals (Bottoms)	(PE) Pemko	McKinney, Reese,
Door Sweeps	(PE) Pemko	McKinney, Reese,
Drip Cap	(PE) Pemko	McKinney ,Trimco
Dust Proof Strike	(RO) Rockwood	

Miscellaneous:

Silencers	(RO) Rockwood	McKinney ,Trimco
Key Cabinets	TelKee	Lund
Signs	(RW) Rockwood	Hager, Trimco

Electrical hardware:

Electromag Lock	(SU) Securitron	Folger Adam
Power Supply	(SU) Securitron	Folger Adam,
Power Transfer	(SU) Securitron	Folger Adam,
Door Position Switch	(SU) Securitron	Folger Adam,
Door Release	(SU) Securitron	Folger Adam,
Electric LOCKS	(CR) Corbin Russwin	Yale
Key Pads or Key Switches	(SU) Securitron	Folger Adam,
Keypad locks	(YA) Yale	NO SUBSTITUTIES
Card Readers	(HD) HID	NONE

2.4 HINGES, GENERAL

- A. Quantity: Two (2) hinges per leaf for openings up to 60-inches high. One (1) additional hinge per leaf for each additional 30-inches in height or fraction thereof. Four (4) hinges for dutch doors up to 90-inches in height.
- B. Template Requirements: Provide only template-produced units, except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames.
- C. Hinge Weight: Interior doors to be standard weight minimum; entrance (exterior) doors to be heavy-weight minimum; doors over 3-ft. 5-inches in width shall have extra heavy weight ball bearing hinges. Hinges may be upgraded in weight pursuant to manufacturer's recommendations in consideration of door weight, frequency of use, frame and door hardware.
- D. Provide ball bearing hinges at all doors with closers. Quantity of ball bearings per hinge to be as recommended by the manufacturer for frequency of use and weight of door.
- E. Out-Swinging Exterior Doors: Provide non-removable (NRP) pins and safety / security studs.
- F. Provide shims and shimming instructions for proper door adjustment.
- G. Hinge Base Metal: Unless otherwise indicated, provide stainless steel, with stainless-steel pin for hinges on exterior, out-swinging doors, and interior hinges for fire-rated assemblies. Provide steel, with steel pin for other interior hinges.
- H. Hinge Options:
 - 1. Hospital Tips (HT): Provide slope ends of hinge barrel where security / safety is a concern.
 - 2. Safety / Security Studs: Designed for stud in each leaf to engage hole in opposing leaf. Provide on all out-swinging exterior doors, interior security doors and on all other doors where noted and/or required for room's designated use.
 - 3. Non-Removable Pins (NRP): Provide on all out-swing exterior doors, interior security doors and on all other doors where noted and/or required for room's designated use.
- I. Electrified Functions for Hinges: If any electrified door hardware is specified for this Project, with power transfer and monitoring functions, provide molex connectors (QC), secured at each leaf and continuous through hinge knuckle, and with concealed electrical monitoring switch.

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2.5 HINGES

- A. Butts and Hinges: BHMA A156.1. Hinge open widths minimum, but of sufficient throw to permit maximum door swing. Steel or stainless steel pins and concealed bearings.
 - 1. Template Hinge Dimensions: BHMA A156.7.
- B. Self-Closing Spring Hinges: BHMA A156.17.
- C. Continuous Stainless Steel Hinges: All hinges to be non-handed and of slim barrel design. Hinges to be made of type 304 stainless steel and shall have a concealed teflon-coated stainless steel pin with twin self-lubricated nylon bearings at each knuckle. Hinges shall be UL listed up to and including 3 hours and shall be available with power transfer cutouts when necessary.
- D. Continuous Geared Hinges: For standard, conform to BHMA A156.26. Continuous geared hinges shall be manufactured of extruded 6063-T6 aluminum alloy / temper, consisting of three interlocking extrusions in a pinless assembly applied to the full height of the door and frame. All hinges shall be manufactured to template screw, and template bearing locations. Heavy-duty 83-inch hinges shall require 27-bearings for each leaf, rated for a maximum door weight of 540-lbs. All hinges shall be manufactured non-handed. The frame leaf shall be independently milled. The frame leaf and the door leaf shall be anodized after all milling and drilling processes are complete. All aluminum component parts shall be anodized in accordance with 204-R1 (AA-M12C22A31) 'clear' or HC-II (AA-M12C22A44) 'dark bronze.' Thrust type bearings shall carry the vertical loads and be completely concealed by the gear cap over the full length of the hinge. Hinges must meet the requirements of UBC7-2 1997 and UL10C. All hinges shall be capable of Underwriters Laboratories Inc. certification up to and including 90-minute applications for wood doors as well as 3-hour applications for hollow metal doors. Hinges shall be UL listed without restrictions for gauge of metal or wall type conditions. All hinges shall be tested as directed by The Builders Hardware Manufacturers Association.
- E. Pivots and Pivot Hinges:
 - 1. Pivots: BHMA A156.4. Complete with ball-bearing, oil-impregnated top pivot, floor plates, intermediate pivots and cement boxes unless indicated otherwise. High-strength forged bronze or stainless steel, tilt-on precision bearing and bearing pin. Bottom and intermediate pivots to be adjustable of minus 1/16-inch, plus 1/8-inch.
 - a. For offset pivoted doors, provide one intermediate pivot for doors less than 91-inches high. Two intermediate pivots for doors between 91-inches and 121-inches high. Intermediate pivots spaced equally not less than 25-inches or not more than 35-inches on center, for doors over 121-inches high.
 - b. Basis-of-Design Product: Rixson Specialty Door Controls, Franklin Park, IL.
 - 1) Rixson L147 and ML19 series for lead lined doors.
- F. Electric Full-Mortise Hinges: Located at second hinge from bottom. Where used in conjunction with exit devices, locate hinge nearest to exit device. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Provide mortar guard for each electric hinge specified.
- G. Electrified Quick Connect Stainless Steel Continuous Transfer Hinges: Provide electrified transfer stainless steel continuous hinges with electrical transfer access prep accessible without de-mounting door from the frame. Furnish with Molex™ standardized plug connectors with sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses.

for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

- a. Markar Products; ASSA ABLOY Architectural Door Accessories (MR) - MP-ETAP-EL (# wires) Option.
- b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - MCK-ETAP-EL (# wires) Option.

H. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

I. Electrified Quick Connect Data Transfer Hinges: Provide combined electrified power and Ethernet data transfer hinges with Molex™ standardized plug connectors to accommodate Electrified Quick Connect Data Transfer Hinges: Provide combined electrified power and Ethernet data transfer hinges with Molex™ standardized plug connectors to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Data transfer hinges feature two 6-position and two 4-position Molex connectors, 9 multi-strand wires; 2 twisted pairs (26 AWG), 4 straight conductors (28 gauge) and 1 straight conductor (22 AWG) with concealed plug connectors eliminating the need for separate or exposed wiring. Rated 350 mA continuous @ 48 volts DC nominal, the hinge is capable of two PoE wiring configurations:

- a. Power over Data (5 wire): Power and Data supplied together over the 2 twisted 26 AWG) pairs. The 22 AWG conductor is used for the earth ground connection.
- b. Data with Power over Spares (9 wire): Data over 2 twisted (26 AWG) pairs with Power over spare pairs 94 straight 28 AWG conductors). The 22 Awg conductor is used for earth ground connection.

2. Manufacturers:

- a. Markar Products; ASSA ABLOY Architectural Door Accessories (MR) – PoE Series.
- b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) – PoE Series.
- c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE) – PoE Series.

J. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified

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hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:
 - a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Electrical Connecting Kit: QC-R001.
 - b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:
 - a. Hager Companies (HA) - Quick Connect.
 - b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) – QC-C Series.
 - c. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) – PoE Series.

2.6 MECHANICAL LOCKS AND LATCHES:

A. Mortise Locksets and Latchsets: As scheduled.

1. All mortise locksets and latchsets are to be UL listed.
2. Chassis: Cold-rolled steel, handing field-changeable without disassembly.
3. Latchbolts: 3/4-inch throw stainless steel anti-friction type. Stamp face to indicate lockset is UL listed.
4. Lever Trim: Through-bolted, accessible design, cast lever or solid extruded bar type levers as scheduled. Filled hollow tube design unacceptable.
 - a. Spindles: Security design independent break-away. Breakage of outside lever does not allow access to inside lever's hubworks to gain wrongful entry.

5. Thumbturns: Accessible design not requiring pinching or twisting motions to operate.
6. Deadbolts: Stainless steel 1-inch throw.
7. Electric Operation: Manufacturer-installed Ecoflex motor driven lock bodies.
8. Strikes: 16 gage curved steel, bronze or brass with 1-inch-deep box construction, lips of sufficient length to clear trim and protect clothing.
9. Certifications:
 - a. ANSI A156.13, 1994, Grade 1 Operational, Grade 1 Security.
 - b. ANSI/ASTM F476-84 Grade 1 UL Listed.

10. Basis-of-Design Product: Corbin Russwin Manufacturing Company, New Haven, CT.
 - a. Corbin Russwin ML2000 series,
 - b. Accepted Substitutions: Yale,

11. Knurling: Where required by local code provide knurling to all levers on doors leading to hazardous areas such as mechanical rooms, boiler and furnace rooms, janitor closets, and as otherwise required or specified. **Provide Knurling on bottom side of levers (No coating)**

2.7 ELECTROMAGNETIC LOCKS

- A. Indicate configuration of electromagnetic locks - direct-hold or shear type - and mounting in door hardware sets or on Drawings.
- B. General: BHMA A156.23 Grade 1; electrically powered, of strength and configuration indicated; with electromagnet attached to frame and armature plate attached to door.
 - 1. Type: Full exterior or full interior, as required by application indicated.
 - 2. Strength Ranking: 1200 lbf.
 - 3. Inductive Kickback Peak Voltage: None.
 - 4. Residual Magnetism: None
- C. Delayed-Egress Locks: BHMA A156.24.
 - 1. Means of Egress Doors: Lock releases within 15-seconds after applying a force not more than 15-lbf for not more than 3-seconds, as required by NFPA 101.
 - 2. Security Grade: Activated from secure side of door by initiating device.
- D. Basis-of-Design Product: Securitron.
 - 1. Accepted Substitutions: Folger Adam.

2.8 EXIT LOCKS AND EXIT ALARMS

- A. Exit Locks: BHMA A156.29; surface mounted, battery powered, housed in metal case; with red-and-white lettering reading "EMERGENCY EXIT PUSH TO OPEN--ALARM WILL SOUND."
- B. Stand-Alone Exit Alarms: BHMA A156.29; Mounted separate from door and activated by door movement switch.
- C. System to include low-battery alert, outside key control, automatic rearming after authorized use with adjustable time delay and remote signal capability for connection to remote indicating panel.
- D. Basis-of-Design Product: Corbin Russwin Manufacturing Company, New Haven, CT.
 - 1. Corbin Russwin ED5000 Alarm
 - 2. Accepted Substitutions: Yale,

2.9 DOOR BOLTS

- E. Bolt Throw: Comply with testing requirements for length of bolts required for labeled fire doors and other intended applications. Minimum 3/4-inch throw.
- F. Dustproof Strikes: BHMA A156.16.
- G. Surface Bolts: BHMA A156.16.
 - 1. Flush Bolt Heads: Minimum of 1/2-inch-diameter rods of brass, bronze, or stainless steel with minimum 12-inch-long rod for doors up to 84-inches in height. Provide longer rods as necessary for doors exceeding 84-inches.
 - 2. Basis-of-Design Product: McKinney Products Company, Scranton, PA
 - a. Acceptable Substitutions: Trimco, Rockwood.

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- H. Manual Flush Bolts: BHMA A156.16; designed for mortising into door edge.
 - 1. Basis-of-Design Product: McKinney Products Company, Scranton, PA
 - a. Acceptable Substitutions: Trimco, Rockwood.

- I. Semi-Automatic Flush Bolts: BHMA A156.16; Low operating force design, consistent with application. To be installed in top edge of inactive leaf of pair of doors in conjunction with automatic flushbolt installed in bottom edge of inactive leaf. A door coordinator is required.
 - 1. Basis-of-Design Product: McKinney Products Company, Scranton, PA.
 - a. McKinney FB01M Series for metal doors, FB02W Series for wood doors. (Must be used in conjunction with McKinney FB06M or FB10W Series automatic flushbolt, and Trimco's CSM500 Series door coordinator.)
 - b. Acceptable Substitutions: Trimco, Rockwood.

- J. Automatic Self-Latching Flush Bolts: BHMA A156.16; low operating force design, consistent with application. To be installed in top and bottom edge of inactive leaf of pair of doors.
 - 1. Basis-of-Design Product: McKinney Products Company, Scranton, PA
 - a. McKinney FB06M Series for metal doors and FB10W Series for wood doors. (Must be used in conjunction McKinney CSM500 Series door coordinator.)
 - b. Acceptable Substitutions: Trimco, Rockwood.

2.10 EXIT DEVICES / PANIC HARDWARE

A. General:

- 1. Exit Devices: BHMA A156.3.
- 2. Exit Devices for Means of Egress Doors: Comply with NFPA 101. Locks shall not require use of a key, tool, or special knowledge for operation.
- 3. Panic Exit Devices: For panic protection, based on testing according to UL 305.
- 4. Fire Exit Devices: Comply with NFPA 80 for fire and panic protection, based on testing according to UL 305 and NFPA 252.
- 5. Removable Mullions: BHMA A156.3.
- 6. Fire-Exit Removable Mullions: Removable mullions for use with fire exit devices complying with NFPA 80 for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions shall be used only with exit devices for which they have been tested.
- 7. Dummy Push Bar: Provide rigid, nonfunctioning push bar matching functional push bar.
- 8. Outside Trim: Match design, material and finish of locksets and latchsets, unless otherwise indicated.
- 9. Through Bolts: For exit devices and trim on metal doors, non-fire-rated and fire-rated wood doors.
- 10. Electronic Exit Bars: Non-latching electronic releasing device activated by an adjustable capacitance sensor, with no moving parts; listed and labeled as panic exit hardware. Fabricate bar from extruded aluminum, and provide door and frame transfer device and 16 feet of cord to route wiring off the door frame.

B. General features:

- 1. Mounting rails shall be formed from a solid single piece of stainless steel, brass or bronze no less than 0.072" thick.
- 2. Push rails shall be constructed of 0.062" thick material.
- 3. Painted or anodized aluminum shall not be considered heavy duty and is not acceptable.

4. Lever trim shall be available in finishes and designs to match that of the specified locksets.
5. All exit devices to be of a heavy duty, chassis mounted design, with one piece removable covers, eliminating necessity of removing the device from the door for standard maintenance and keying requirements.
6. All trim to be thru-bolted to the lock stile case. Lever design to be the same as specified with locksets.
7. All Exit device lever operating trim to be rated for a minimum of 1,000 inch pounds of pressure without allowing access.
8. All metal end caps to be standard with all exit devices.

C. Specific features:

1. Non-Fire Rated Devices: Cylinder dogging.
2. Rod and latch guards with surface vertical rod devices.
3. Fire-Labeled Devices: UL label indicating "Fire Exit Hardware." Vertical rod devices less bottom rod (NB) unless otherwise scheduled.
4. Impact recessed devices.
5. Delayed Egress Devices: delayed egress exit devices to be specified in the hardware sets. Devices to conform to NFPA 101 - Special Locking Arrangements for delayed egress. Nuisance delay to be available as standard for either zero (0) or two (2) seconds. Internal latchbolt monitoring, and a standard 10-second delay for "Authorized Entry" to be standard features on every device. Delayed egress feature to be available throughout all styles and sizes of exit devices including: Panic and Fire rated Rim, Wide and Narrow Stile, Mortise, Surface Vertical Rod, and Concealed Vertical Rod.
6. Electrically Operated Devices: Single manufacturer source for electric latch retraction devices, electrically controlled trim, monitoring switches and controls.
7. Lever to match lock / latch trim.
8. Removable Mullions: Removable with single turn of building key. Securely reinstalled without need for key. Furnish storage brackets for securely stowing the mullion away from the door when removed.
9. Basis-of-Design Product: Corbin Russwin Manufacturing Company, New Haven, CT.
 - a. Corbin Russwin ED5000
 - b. Accepted Substitutions: None

2.11 KEYING REQUIREMENTS

A. Key System:

1. **Match Owners existing Medeco Keysystem. Meet with facility prior to ordering for verification of Medco keyway and system requirements.**
2. Basis-of-Design Product: Medeco Manufacturing, ASSA ABLOY
 - a. Medeco
 - b. Accepted Substitutions: , None
3. Provide temporary construction cores and keys during the construction period.

B. Key Cylinders: Minimum 6-pin solid brass construction.

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- C. Locks and Cylinders: Keyed at factory of lock manufacturer or local supplier where permanent records are maintained. Locks and cylinders same manufacturer.
- D. Permanent Keys: Secured shipment direct from point of origination to Owner's representative.
 - 1. For Estimate: Four (4) keys per change combination, six (6) master keys per group, six (6) grand-master keys, 3 control keys.
- E. Bitting List: Secured shipment direct from point of origination to Owner's representative upon completion. Patented
- F. Door hardware supplier (Div 87100) to provide all cylinders as specified in hardware sets below including permanent removable cores for POE locks and exit devices.
- G. Provide key management software program. Software package shall include free one year technical support and free upgrades as it becomes available. Software shall have customized query, reporting, and search capabilities and allow for tracking of all issued keys. Display of key-holder photographs and signatures shall be allowed. Specified Manufacturer: *Corbin Russwin Key Wizard* Approved substitutes are: Sargent and Yale

2.12 KEY CONTROL SYSTEM

- A. Keys: Nickel silver, permanently inscribe each key with a visual key control number and include the notation: "DO NOT DUPLICATE."
- B. Key Control Cabinet: BHMA A156.5; Key cabinet with painted enamel finish, complete with all system components and instructions for dual tag system. Allow for 20 percent in excess of actual requirements. Provide a key chart to Owner at completion of Work indicating the schematics of the keying system.
 - 1. Basis-of-Design Product: Tri Palm International, 222 East Campus View Blvd., Columbus, OH.
 - a. Telkee management systems.
 - b. Acceptable Substitutions: Lund.
- C. Key Lock Boxes: Designed for storage of four (4) keys, with tamper switches to connect to intrusion detection system.

2.13 ACCESSORIES FOR PAIRS OF DOORS

- A. Carry-Open Bars: Provide carry-open bars for inactive leaves of pairs of doors unless automatic or self-latching bolts are used. Provide strike plate as necessary. Match other hardware in material and finish.

2.14 CLOSERS

- A. General:
 - 1. Hold-Open Closers / Detectors: Coordinate and interface integral smoke detector and closer device with fire alarm system.
 - 2. Power-Assist Closers: As specified in Division 08 Section "087113 - AUTOMATIC DOOR OPERATORS" for access doors for people with disabilities or where listed in the door hardware sets.

3. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
 4. Surface Closers: Provide parallel arm type where possible, but arm must be of type required for closer to always be located inside building, stairs and rooms (on non-public side of door), unless otherwise indicated.
 5. Closer Holder Release Devices: On release of life-safety type hold open, door becomes self-closing. Automatic release is activated by smoke detection system and/or loss of power.
 6. Through Bolts: For surface mounted closures on metal doors, fire rated and non-fire-rated wood doors, only when and where approved by the Architect.
- B. Surface Closers:
1. All door closers shall be ANSI 156.4, Grade 1 Certified.
 2. All closers shall have aluminum alloy bodies, forged steel arms, and separate valves for adjusting backcheck, closing and latching cycles and adjustable spring to provide up to 50% increase in spring power.
 3. Closers shall be furnished with parallel arms mounting on all doors opening into corridors or other public spaces and shall be mounted to permit 180 degrees door swing wherever wall conditions permit.
 4. Thru-bolts and wood doors unless doors are provided with closer blocking. Non-sized and adjustable. Place closers inside building, stairs and rooms.
 5. Plates, brackets and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.
 6. Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.
 7. Heavy-duty arms (P10) at exterior doors scheduled with parallel arm units.
 8. Application specific operation.
 9. Basis-of-Design Product: Corbin Russwin Company, New Haven, CT.
 - a. Corbin Russwin DC6000 series
 - b. Accepted Substitutions: Sargent, Norton and Yale
- C. Coordinators: BHMA A156.3.
1. Basis-of-Design Product: McKinney Products Company, Scranton, PA.
 - a. McKinney CSM500.
 - b. Acceptable Substitutions: Trimco, Rockwood.
- D. Electric Low-Energy Door Operators: Comply with ANSI/BHMA 156.19. Electric power-open, hydraulically checked spring power closing. Modular construction. Finished metal cover. Field-adjustable opening force, opening speed, time-open, closing and latching speeds. Door reopens and timing cycle restores if system re-actuated during closing cycle. Breakaway clutch protection from forced closing. Door, frame, motor and drive train protected by attenuated initiation of opening cycle. These door operators are not intended for high abuse high usage openings. They are not intended for exterior openings or openings that are required to open quickly while meeting ADA guidelines.
1. Self-contained low-voltage power supply, terminal strip and sequencing for incorporation of electric hardware with system operation.
 2. Basis-of-Design Product: Besam.
 - a. Besam Swingmaster
 - b. Accepted Substitutions: Stanley and Horton-

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2.15 PROTECTIVE TRIM UNITS

- A. Size: 2-inches less than door width on push side and 1-inch less than door width on pull side, by height specified in door hardware sets.
- B. Fasteners: Sheet-metal screws of same material and finish to match plates.
- C. Metal Protective Trim Units: BHMA A156.6; beveled top and 2 sides; fabricated from 0.050-inch minimum thickness stainless steel, unless otherwise indicated.
 - 1. Basis-of-Design Product: McKinney Products Company, Scranton, PA.
 - a. McKinney KP50.
 - b. Acceptable Substitutions: Rockwood, Trimco.

2.16 STOPS AND HOLDERS

- A. Door Stops and Bumpers: BHMA A156.8. Provide stops to protect wall, casework or other hardware. Unless otherwise noted in Hardware Sets Schedule, provide wall type with appropriate fasteners similar to Ives WS406. Where wall type cannot be used, provide overhead type. If neither can be used, provide floor type similar to Ives FS436.
 - 1. Basis-of-Design Product: McKinney Products Company, Scranton, PA.
 - a. McKinney Model No. WS02 for walls, and FS01/02 for floors as required.
 - b. Accepted Substitutions: Rockwood, Trimco.
- B. Combination Overhead Stops and Holders: BHMA A156.8. Non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.
 - 1. Basis-of-Design Product: Rixson Specialty Door Controls, Franklin Park, IL
 - a. Rixson 9 Series
 - b. Acceptable Substitutions: Sargent
- C. Electromagnetic Door Holders: BHMA A156.15. Coordinate and verify compatibility with fire detectors and interface with fire alarm system for labeled fire door assemblies.
- D. Mechanical Door Holders: BHMA A156.16.
- E. Silencers: Interior hollow metal and wood frames; fabricated for drilled-in application to frame; 3 for single doors, 4 for pairs of doors. Omit where adhesive mounted seal occurs. Leave no unfilled / uncovered pre-punched silencer holes.
 - 1. Metal Door Frames: BHMA A156.16, Grade 1; rubber, minimum diameter 1/2 inch; fabricated for drilled-in application to frame.
 - 2. Wood Door Frames: BHMA A156.16, Grade 1; rubber, minimum 5/8 by 3/4 inch; fabricated for drilled-in application to frame.
 - 3. Basis-of-Design Product: McKinney Products Company, Scranton, PA.
 - a. Acceptable Substitutions: Trimco, Rockwood.

2.17 DOOR GASKETING

- A. Standard: BHMA A156.22

- B. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.
1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
 2. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
 3. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.
- C. Resilient seal material: Solid high-grade neoprene. UL label applied to seals on rated doors. Products finished to match adjacent frame color.
1. Solid Neoprene: MIL Spec. R6855-CL III, Grade 40.
 2. Silicone : For smoke and fire-rated gasketing.
 3. Non-corroding fasteners at in-swinging exterior doors.
 4. Air Leakage: Not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283. Adhesive applied components are not acceptable.
 5. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 for smoke-control ratings indicated, based on testing according to UL 1784. Adhesive mounted components are not acceptable.
 - a. Provide smoke-labeled gasketing on 20-minute-fire-rated doors and on smoke-labeled doors.
 6. Fire Rated Doors, Resilient Seals: Assemblies complying with NFPA 80 for fire ratings indicated, based on testing according to UL10C / UBC-7-2 compliant. Coordinate with selected door manufacturer and selected frame manufacturer's requirements. Where rigid housed resilient seals are scheduled in this Section and the selected door manufacturer only requires an adhesive mounted resilient seal, furnish rigid housed seal at minimum, or both the rigid housed seal and the adhesive applied seal if necessary to fulfill door manufacturer's requirement. Adhesive applied seal alone is deemed insufficient for this Project.
 - a. Provide fire-rated gasketing on doors with greater than 20-minute-fire-ratings.
 7. Fire-Rated Doors, Intumescent Seals: Assemblies complying with NFPA 80 for fire ratings indicated, based on testing according to UL10C / UBC-7-2. Furnished by selected door manufacturer, these seals vary in requirement by door type and door manufacturer. Adhesive applied intumescent strips are not acceptable. Use concealed-in-door-edge type or kerfed-in-frame type. Careful coordination required.
 8. Sound Control Openings: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408. Ensure that the door leafs have the necessary sealed-in-place STC ratings. Adhesive applied components are not acceptable. Fasten applied seals over bed of sealant.
 9. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer / supplier.
 10. Basis-of-Design Product: McKinney Products Company, Scranton, PA
 - a. McKinney MCK-303AV for weatherstripping.
 - b. McKinney MCK-S773 for light and sound.
 - c. McKinney MCK-303AS for smoke-labeled gasketing.
 - d. McKinney MCK-303AS for fire-rated gasketing.
 - e. Acceptable Substitutions: Pemko, Reese and Zero.

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- D. Automatic Door Bottoms: Low operating force units. Doors and automatic door bottoms plus head and jamb seals cannot require more than two pounds operating force to open when closer is disconnected.
 - 1. Basis-of-Design Product: McKinney Products Company, Scranton, PA.
 - a. McKinney MCK– 412C.
 - b. Acceptable Substitutions: National Guard, Reese, and Zero.

2.18 THRESHOLDS

- A. Standard aluminum, complying with BHMA A156.21, bevel raised thresholds, not to exceed 1/2-inch in overall height.
 - 1. Basis-of-Design Product: McKinney Products Company, Scranton, PA.
 - a. McKinney MCK–2005AV with vinyl bulb at stop **OR** McKinney MCK–271A with MCK–315 door bottom.
 - b. Acceptable Substitutions: Pemko, Reese, and Zero.
- B. Carpet Dividers: Provide firestops under all ‘B’ and ‘C’ rated doors where carpet occurs each side of door, and where carpet occurs one side under any fire rated door.
 - 1. Basis-of-Design Product: McKinney Products Company, Scranton, PA.
 - a. McKinney 236A firestop under all ‘C’ labeled doors; No. MCK–2364A firestop under all ‘B’ labeled doors; No. MCK–174C stop where carpet occurs one side under any labeled door.
 - b. Acceptable Substitutions: Pemko, Reese, and Zero.
- C. Tile Dividers: Provide a 4-inch-wide aluminum plate under all ‘B’ and ‘C’ labeled doors where tile occurs each side of door. Butt tile into plate. Plate to match thickness of tile.

2.19 PUSH AND PULL PLATES

- A. Provide 8-inches x 16-inches x .050-inches minimum thickness push plates and pull plates measuring 4-inches x 16-inches x .050-inches minimum thickness, with 1-inch round pull x 10-inches on center.
 - 1. Basis-of-Design Product: McKinney Products Company, Scranton, PA.
 - a. McKinney, Model No. P055 for push plate, and DP 503 for pull plate.
 - b. Acceptable Substitutions: Trimco, and Rockwood.

2.20 MISCELLANEOUS DOOR HARDWARE

- A. Boxed Power Supplies: Modular unit in NEMA ICS 6, Type 4 enclosure; filtered and regulated; voltage rating and type matching requirements of door hardware served; and listed and labeled for use with fire alarm systems. (PROVIDED BY DIV 281300)
- B. Monitor Strikes: Dustbox monitor for installation under standard strike.
- C. Electric Strikes: BHMA A156.31; use fail-secure electric strikes with fire-rated devices.
- D. Auxiliary Hardware: BHMA A156.16.

2.21 FINISHES

A. Standard: 626 Finish

1. Areas using BHMA , all butt hinges for out-swinging exterior doors, exit devices, push plates, push / pull bars, kick / mop / stretcher / armor plates, edge guards, and latch protectors shall be of 626 -, unless otherwise noted. = See sets below for required finishes.

B. Door Closers: Provide satin-chrome plated or factory powder coated arms, tracks and covers to match adjacent hardware where scheduled.

C. Thresholds: Mill-aluminum finish.

D. Gaskets and Other Aluminum Items: Match predominant adjacent materials in color and finish.

1. Color of seals to coordinate with frame color.

E. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

F. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.22 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.

C. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended, unless specified otherwise herein. Aluminum fasteners are not permitted. Provide Phillips flat-head steel machine or wood screws in exposed conditions with finished heads to match finish of door hardware.

1. Steel Machine and Wood Screws: Provide thread-to-the-head type for fire-rated applications as well as all installations of mortise hinges to doors, strike plates to frames, and surface mounted closers to doors and frames.
2. Steel Through Bolts: Through bolting is allowed for installation of door hardware only where bolt head or nut on opposite face is totally concealed, i.e. door pulls with bolt heads concealed on opposite side of door behind push plate, etc. OR in areas where extreme abuse to door may be a problem. Coordinate with "Exit Devices" and "Closers" Articles in

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- Part 2 above. Provide spacers / sleeves or Sex Bolts for through bolting of hollow-metal doors.
3. Provide self-tapping (TEC) screws for attachment of sweeps and stop-applied weatherstripping / gasketing.
 4. When hardware is to be attached to existing metal surface and insufficient reinforcement exists, use RivNuts, NutSerts or similar anchoring device for screws.
- D. Carefully coordinate with door manufacturer the installation of required blocking reinforcement during the fabrication of HM and wood doors for the installation of surface mounted hardware to doors and frames. Through bolting for anchoring of hardware to doors (fire rated and/or non-fire rated), due to lack of coordination and resulting in door lacking proper blocking reinforcement, IS NOT ACCEPTABLE.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and frames indicated to receive door hardware and conditions under which door hardware will be installed, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting application and/or performance. If any electrified door hardware is specified for this Project, examine roughing-in for electrical power systems to verify actual locations of wiring connections before any electrified door hardware is installed. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to application, to the proper and timely completion of the work and performance of the hardware. Proceed with installation only after unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 PREPARATION

- A. Steel Doors and Frames: Comply with DHI A115 Series.
1. For surface-applied door hardware, drill and tap doors and frames according to ANSI A250.6.
- B. Wood Doors: Comply with DHI A115-W Series.
- C. Ensure that walls and frames are square and plumb before hardware installation.

3.3 INSTALLATION

- A. Installation of hardware shall comply with NFPA 80 and NFPA 101 requirements.
- B. Mounting Heights: Mount door hardware units at heights specifically indicated herein or on Drawings:
1. Required Heights:
 - a. Hospital combination push/pull latch: Centered 45-inches above finish floor.
 - b. Panic bolt cross bars align in horizontal position with top and bottom bolts and rods aligned vertically. Install the centerline of strike 36-inches above finish floor.
 - c. Knob lock and knob latch strikes; center 40-inches above finish floor.
 - d. Push bars centered 42-inches above finish floor.

- e. Push plates and pull handles centered 42-inches above finish floor.
 - f. Mortise deadlock strike centered 48-inches above finish floor.
 - g. Extension level flush in the edge of door, center to bolt fronts, 12-inches from bottom and 12-inches from top edge of door.
2. For all other door hardware units not listed above or dimensioned on Drawings, mount units at heights recommended by the following, unless otherwise indicated or required to comply with governing regulations.
- a. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - b. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
 - c. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- C. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been 100 percent completed on substrates involved.
- 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- D. Anchor all components firmly into position for long life under hard use. Use only the anchoring devices furnished with the hardware item, unless otherwise specifically directed.
- E. Install hardware in accurate conformity with the manufacturer's templates, particularly with respect to the measurement of door control devices from the jamb.
- F. Gaskets: Install jamb-applied gaskets before closers, overhead stops, rim strikes, etc.
- G. Door Sweeps: Install sweeps across bottoms of doors before astragals, cope sweeps around bottom pivots, trim astragals to tops of sweeps.
- H. Door Closing Devices: Install and adjust in strict accordance with the templates and printed instructions supplied by the manufacturer. Insofar as practicable, doors opening to or from halls or corridors shall have the closer mounted on the room side of the door.
- I. Kick Plates: on single-acting doors, install on push side. Kick plates on double-acting doors, install on both sides of door.
- J. Floor Stops: Locate stops not more than 4-inches from face of wall.
- K. Drill pilot holes for fasteners in wood doors and frames. Drill 5/32-inch hole and use No. 12, 1-1/4-inch steel threaded-to-the-head wood screws for hinges on wood doors.
- L. Boxed Power Supplies: If any electrified door hardware is specified for this Project, locate power supplies as indicated or, if not indicated, above accessible ceilings on secure side of doors and/or in equipment room(s). Verify locations with Architect.

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1. Provide the least number of power supplies required to adequately serve doors with electrified door hardware.
- M. Thresholds: Set thresholds for exterior, and acoustical doors at sound control openings in full bed of sealant complying with requirements specified in Division 07 Section "079200 - JOINT SEALANTS", forming a tight seal between threshold and surface to which set. Securely and permanently anchor thresholds, using countersunk 1/4-inch stainless steel fasteners and lead expansion shield anchors, or Red-Head #SFS-1420 (or approved equivalent) Flat Head Sleeve Anchors (SS/FHSL) at aluminum thresholds.
- N. Key Control System Cabinet: Install key cabinet(s) where directed by the Architect.
- O. Lead Protection: Lead wrap or lead line hardware penetrating lead-lined doors, including levers and roses. Apply kick and armor plates with 3M adhesive #1357, as recommended by 3M Co., on lead-lined doors.

3.4 INITIAL ADJUSTING

- A. Post Installation Inspection: Approximately two (2) weeks prior to scheduled date of Substantial Completion inspection, supplier's AHC, installer and representatives from the manufacturers of the locking devices, including any electrified door hardware if specified for this Project, door control, and any other operating items of door hardware, will visit Project to examine, re-adjust including adjusting operating forces; verify operating and control items of hardware are installed according to manufacturer's installation instructions and templates; check each door to ensure proper operation or function of every unit. AHC will prepare and submit written report to Architect identifying deficiencies, current problems and likely future problems.
1. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements as specified herein, unless required otherwise by Authorities Having Jurisdiction.
 2. Replace units that cannot be adjusted to operate freely and smoothly as intended for the application.
 3. Hardware damaged by improper installation or adjustment methods to be repaired or replaced to Owner's satisfaction.
 4. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 5. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 6. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

3.5 DEMONSTRATION

- A. Factory authorized representative to demonstrate all door hardware, including any electrified hardware items if specified for this Project, with particular attention to adjustment, maintenance procedures, etc.. Refer to "Maintenance Service" Article in Part 1 of this Section, and Division 01 Section "017900 - DEMONSTRATION AND TRAINING."

3.6 PROTECTION AND CLEANING

- A. Protect mechanical finishes on exposed surfaces from paint, cleaning agents, weathering, carts / barrows, etc. by applying a strippable, temporary protective covering before shipping. Maintain conditions that ensure door hardware remains without damage or deterioration.

Remove covering materials and clean hardware to restore proper function and finish just prior to Substantial Completion.

- B. Clean adjacent wall, frame and door surfaces soiled from installation / reinstallation process.

3.7 DOOR HARDWARE SETS SCHEDULE

A. GENERAL

1. Refer to "Door Schedule" in Drawings to the Contract Documents for hardware set assignments at each door opening. Ignore any hardware sets not listed in "Door Schedule."
2. Manufacturers and their abbreviations used in this Sets Schedule are listed in "Manufacturers of Scheduled Hardware" Article in Part 2 of this Section.
3. This Sets Schedule is generic and shall be considered a guide only. Hardware items listed are to show basic operation / function of doors. Hardware Supplier to furnish items by actual manufacturing catalogue numbers, making sure each item fits door function, swing, size, thickness, and meets all fire / safety codes, i.e. UL, etc., regardless of whether called for in Sets Schedule or not as hardware set numbers are used on different types of doors.
4. General types and approximate quantities of door hardware are indicated in the list of door hardware sets to provide a basis for the cost of installation and other Work that is part of the Contract Sum.
5. Hardware Supplier is cautioned to refer to General Conditions, Special Conditions, and Paragraph 'A' to "General Requirements" Article in Part 2 of this Section. It shall be the hardware Supplier's responsibility to furnish all necessary and required hardware.
6. Doors in fire / smoke walls to have latching hardware and closers U.N.O. Smoke seals are optional.
7. If door has no wall to swing against, use overhead stop, or closer with stop.
8. If door is required to be sound proof, add sound seals and auto door drop.
9. Use kick plates or armor plate at high traffic doors.
10. Provide overhead shock absorbing stop at all exterior HM doors at Mechanical / Electrical Rooms and at stair doors leading to exterior grade or at roof level.
11. All lock functions, applications and keying shall be reviewed with the architect and owners at a meeting before finish hardware schedules are submitted for final approval

3.8 DOOR HARDWARE SETS SCHEDULE

1. MK - McKinney
2. MR - Markar
3. RO - Rockwood
4. RU - Corbin Russwin
5. YA - Yale
6. MC - Medeco
7. RF - Rixson
8. OT - Other
9. PE - Pemko
10. HD - HID
11. SU - Securitron

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Set: 1.0

Doors: [6-134](#), [6-149](#), [6-157](#), [6-163](#)

Description: CONFERENCE / CONSULT / NURSE EDU - PASSAGE SET - RA CLOSER - KP - WS - SG

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Passage Latch	ML2010 NSA	626C	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100

Set: 2.0

Doors: [6-135](#)

Description: WAITING ROOM - PASSAGE SET - RA CLOSER - KP - WS - SG - 3670

3 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Passage Latch	ML2010 NSA	626C	RU	087100
1 Door Closer	DC3200 A10	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100

Set: 3.0

Doors: [6-101](#)

Description: ISOL PATIENT ROOM - HOSPITAL LATCH - KP - MP - WS - SG - ADB

3 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Passage Latch	HP3010 HPSK M38 (Backset as Required)	630C	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100

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1 Gasketing	AM88C	PE	087100
1 Door Bottom	411APKL (Size as Required)	PE	087100

Notes:

*Provide backset of hospital latch to match existing hospital standards.

Set: 4.0

Doors: 6-102, 6-103, 6-104, 6-105, 6-106, 6-107, 6-108, 6-109, 6-110, 6-111, 6-112, 6-113, 6-114, 6-116, 6-117, 6-118, 6-119, 6-120, 6-121, 6-125, 6-126, 6-127, 6-128, 6-129, 6-130, 6-131, 6-132

Description: PATIENT ROOMS - HOSPITAL LATCH - KP - MP - WS - SG

3 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Passage Latch	HP3010 HPSK M38 (Backset as Required)	630C	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C	PE	087100	

Notes:

*Provide backset of hospital latch to match existing hospital standards.

Set: 5.0

Doors: 6-122, 6-124

Description: PATIENT ROOMS - HOSPITAL LATCH - SOHS - KP - MP - SG

3 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Passage Latch	HP3010 HPSK M38 (Backset as Required)	630C	RU	087100
1 Surf Overhead Stop	10-X36	630	RF	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Gasketing	AM88C	PE	087100	

Notes:

*Provide backset of hospital latch to match existing hospital standards.

Set: 6.0

Doors: 6-101T, 6-102T, 6-103T, 6-104T, 6-105T, 6-106T, 6-107T, 6-108T, 6-109T, 6-110T, 6-111T, 6-112T, 6-113T, 6-114T, 6-116T, 6-117T, 6-118T, 6-119T, 6-120T, 6-121T, 6-122T, 6-124T, 6-125T, 6-126T, 6-127T, 6-128T, 6-129T, 6-130T, 6-131T, 6-132T

Description: PATIENT TOILETS - PRIVACY HOSPITAL LATCH - SOHS - KP - MP - SI

087100-32

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Privacy Lock	HP3020 HPSK M38 (Backset as Required)	630C	RU	087100
1 Surf Overhead Stop	10-X36	630	RF	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
3 Silencer	608-RKW		RO	087100

Notes:

*Provide backset of hospital latch to match existing hospital standards.

Set: 7.0

Doors: [6-135T](#)

Description: SINGLE STALL RESTROOM - PRIVACY LOCK W/ OCC INDICATOR - PA CLOSER X STOP ARM - KP - MP - SG

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Privacy Lock	ML2030 NSA M34 V21	626C	RU	087100
1 Surface Closer	DC3210 A4	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100
1 Coat Hook	RM802	US26D	RO	087100

Set: 8.0

Doors: [6-176](#)

Description: MGR OFFICE - OFFICE LOCK - KP - WS - SG

3 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Entrance Lock	ML2054 NSA LC	626C	RU	087100
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100

Set: 9.0

Doors: [6-138](#)

087100-33

Description: PUBLIC ELEV LOBBY - CLASSROOM TRIM EXIT DEVICE - PA CLOSER X STOP ARM - KP - SG - FIRE RATED

3 Hinge, Full Mortise, Hvy Wt	T4A3786 4-1/2" x 4-1/2"	US26D	MK	087100
1 Fire Rated Rim Exit, Classroom	ED5200A N955ET	626C	RU	087100
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Surface Closer	DC3210 A4	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Gasketing	AM88C		PE	087100

Set: 10.0

Doors:

Description: HARDWARE SET NOT USED

3 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Fire Rated Rim Exit, Classroom	ED5200A N955ET	626C	RU	087100
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Surface Closer	DC3210 A4	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Gasketing	AM88C		PE	087100

Set: 11.0

Doors: [6-148](#), [6-164](#)

Description: STAFF TOILETS - STOREROOM LOCK W/ OCC INDICATOR - RA CLOSER - KP - MP - WS - SG - CH

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Security Storeroom Lock	ML2059 NSA M34 V21 LC	626C	RU	087100
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Door Closer	DC3200 A10	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100
1 Coat Hook	RM802	US26D	RO	087100

Set: 12.0

Doors: [6-136A](#)

087100-34

Description: STORAGE ROOM - STOREROOM LOCK - RA CLOSER X SOHS - KP - SG - FIRE RATED - 4070

3 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Storeroom Lock	ML2057 NSA LC	626C	RU	087100
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Surf Overhead Stop	10-X36	630	RF	087100
1 Door Closer	DC3200 A10	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Gasketing	AM88C		PE	087100

Notes:

Set: 13.0

Doors:

Description: HARDWARE SET NOT USED

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Storeroom Lock	ML2057 NSA LC	626C	RU	087100
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Surface Closer	DC3210 A3	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100

Set: 14.0

Doors: 6-133

Description: ELECTRICAL ROOM - STOREROOM LOCK - RA CLOSER - KP - WS - SG

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Storeroom Lock	ML2057 NSA LC	626C	RU	087100
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Door Closer	DC3200 A10	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100

Set: 15.0

Doors: 6-144

087100-35

Description: DATA / IT - CR - FAIL SECURE LOCK - RA CLOSER - KP - WS - SG

2 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100	
1 Electric Hinge	TA2714-QCXX 4-1/2" x 4-1/2" (Qty of Wires as Required)	US26D	MK	087100	⚡
1 Fail Secure Lock	ML20906-SEC NSA M92 LC	626C	RU	087100	⚡
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100	
1 Door Closer	DC3200 A10	689	RU	087100	
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100	
1 Wall Stop	409	US26D	RO	087100	
1 Gasketing	AM88C		PE	087100	
1 Card Reader	Card Reader by Division 281300		HD	281300	⚡
1 ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100	⚡
1 ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)		MK	087100	⚡
1 Position Switch	DPS-M-BK		SU	087100	⚡
1 Power Supply	AQD (Amperage as Required) - By Division 281300		SU	087100	⚡
1 Diagrams	Riser and Wiring Diagrams		OT		

Notes:

Operational Description: Door is normally closed and locked. Presenting a valid credential to the reader will momentarily unlock the lever. Entry also by mechanical key override. Free egress at all times. Request to exit switch shunts alarm upon exiting. Door position switch reports status of door to access control system. Device is fail secure, upon power failure the door will remain locked.

Set: 16.0

Doors: 6-147

Description: NOUR - CR - FAIL SECURE LOCK - RA CLOSER - KP - MP - WS - SG

2 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100	
1 Electric Hinge	TA2714-QCXX 4-1/2" x 4-1/2" (Qty of Wires as Required)	US26D	MK	087100	⚡
1 Fail Secure Lock	ML20906-SEC NSA M92 LC	626C	RU	087100	⚡
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100	
1 Door Closer	DC3200 A10	689	RU	087100	
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100	
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100	
1 Wall Stop	409	US26D	RO	087100	
1 Gasketing	AM88C		PE	087100	
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1 Card Reader	Card Reader by Division 281300	HD	281300	⚡
1 ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)	MK	087100	⚡
1 ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)	MK	087100	⚡
1 Position Switch	DPS-M-BK	SU	087100	⚡
1 Power Supply	AQD (Amperage as Required) - By Division 281300	SU	087100	⚡
1 Diagrams	Riser and Wiring Diagrams	OT		

Notes:

Operational Description: Door is normally closed and locked. Presenting a valid credential to the reader will momentarily unlock the lever. Entry also by mechanical key override. Free egress at all times. Request to exit switch shunts alarm upon exiting. Door position switch reports status of door to access control system. Device is fail secure, upon power failure the door will remain locked.

Set: 17.0

Doors: [6-154A](#)

Description: MEDS - CR - FAIL SECURE LOCK - RA CLOSER - AP - MP - WS - SG

2 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100	
1 Electric Hinge	TA2714-QCXX 4-1/2" x 4-1/2" (Qty of Wires as Required)	US26D	MK	087100	⚡
1 Fail Secure Lock	ML20906-SEC NSA M92 LC	626C	RU	087100	⚡
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100	
1 Door Closer	DC3200 A10	689	RU	087100	
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100	
1 Armor Plate	K1050 36" X 2" LDW CSK	US32D-MS	RO	087100	
1 Wall Stop	409	US26D	RO	087100	
1 Gasketing	AM88C		PE	087100	
1 Card Reader	Card Reader by Division 281300	HD	281300	⚡	
1 ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)	MK	087100	⚡	
1 ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)	MK	087100	⚡	
1 Position Switch	DPS-M-BK	SU	087100	⚡	
1 Power Supply	AQD (Amperage as Required) - By Division 281300	SU	087100	⚡	
1 Diagrams	Riser and Wiring Diagrams	OT			

Notes:

Operational Description: Door is normally closed and locked. Presenting a valid credential to the reader will momentarily unlock the lever. Entry also by mechanical key override. Free egress at all times. Re-

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quest to exit switch shunts alarm upon exiting. Door position switch reports status of door to access control system. Device is fail secure, upon power failure the door will remain locked.

Set: 18.0

Doors: **6-153A**

Description: SOIL HOLD - CR - FAIL SECURE LOCK - RA CLOSER - AP - MP - WS - SG - FIRE RATED

2 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100	
1 Electric Hinge	TA2714-QCXX 4-1/2" x 4-1/2" (Qty of Wires as Required)	US26D	MK	087100	⚡
1 Fail Secure Lock	ML20906-SEC NSA M92 LC	626C	RU	087100	⚡
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100	
1 Door Closer	DC3200 A10	689	RU	087100	
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100	
1 Armor Plate	K1050 F 36" X 2" LDW CSK	US32D-MS	RO	087100	
1 Wall Stop	409	US26D	RO	087100	
1 Gasketing	AM88C		PE	087100	
1 Card Reader	Card Reader by Division 281300		HD	281300	⚡
1 ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100	⚡
1 ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)		MK	087100	⚡
1 Position Switch	DPS-M-BK		SU	087100	⚡
1 Power Supply	AQD (Amperage as Required) - By Division 281300		SU	087100	⚡
1 Diagrams	Riser and Wiring Diagrams		OT		

Notes:

Operational Description: Door is normally closed and locked. Presenting a valid credential to the reader will momentarily unlock the lever. Entry also by mechanical key override. Free egress at all times. Request to exit switch shunts alarm upon exiting. Door position switch reports status of door to access control system. Device is fail secure, upon power failure the door will remain locked.

Set: 19.0

Doors: **6-165**

Description: STAFF LOUNGE - CR - FAIL SECURE LOCK - RA CLOSER X SOHS - KP - MP - SG

2 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100	
1 Electric Hinge	TA2714-QCXX 4-1/2" x 4-1/2" (Qty of Wires as Required)	US26D	MK	087100	⚡
1 Fail Secure Lock	ML20906-SEC NSA M92 LC	626C	RU	087100	⚡
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100	

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1 Surf Overhead Stop	10-X36	630	RF	087100	
1 Door Closer	DC3200 A10	689	RU	087100	
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100	
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100	
1 Gasketing	AM88C		PE	087100	
1 Card Reader	Card Reader by Division 281300		HD	281300	⚡
1 ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100	⚡
1 ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)		MK	087100	⚡
1 Position Switch	DPS-M-BK		SU	087100	⚡
1 Power Supply	AQD (Amperage as Required) - By Division 281300		SU	087100	⚡
1 Diagrams	Riser and Wiring Diagrams		OT		

Notes:

Operational Description: Door is normally closed and locked. Presenting a valid credential to the reader will momentarily unlock the lever. Entry also by mechanical key override. Free egress at all times. Re-request to exit switch shunts alarm upon exiting. Door position switch reports status of door to access control system. Device is fail secure, upon power failure the door will remain locked.

Set: 20.0

Doors: 6-136, 6-152, 6-153B, 6-158A, 6-158B

Description: TRASH / CLN SUPP / SOIL HOLD / EQ STG - CR - FAIL SECURE LOCK - RA CLOSER - AP - MP - WS - SG - FIRE RATED - 36/40

1 Electric Hinge, Hvy Wt	T4A3786-QCXX 5" x 4-1/2" (Qty of Wires as Required)	US26D	MK	087100	⚡
2 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100	
1 Fail Secure Lock	ML20906-SEC NSA M92 LC	626C	RU	087100	⚡
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100	
1 Door Closer	DC3200 A10	689	RU	087100	
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100	
1 Armor Plate	K1050 F 36" X 2" LDW CSK	US32D-MS	RO	087100	
1 Wall Stop	409	US26D	RO	087100	
1 Gasketing	AM88C		PE	087100	
1 Card Reader	Card Reader by Division 281300		HD	281300	⚡
1 ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100	⚡
1 ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)		MK	087100	⚡

1 Position Switch	DPS-M-BK	SU	087100	⚡
1 Power Supply	AQD (Amperage as Required) - By Division 281300	SU	087100	⚡
1 Diagrams	Riser and Wiring Diagrams	OT		

Notes:

Operational Description: Door is normally closed and locked. Presenting a valid credential to the reader will momentarily unlock the lever. Entry also by mechanical key override. Free egress at all times. Request to exit switch shunts alarm upon exiting. Door position switch reports status of door to access control system. Device is fail secure, upon power failure the door will remain locked.

Set: 21.0

Doors: [6-154B](#)

Description: MEDS - CR - FAIL SECURE LOCK - RA CLOSER - AP - MP - WS - SG - 3670

1 Electric Hinge, Hvy Wt	T4A3786-QCXX 5" x 4-1/2" (Qty of Wires as Required)	US26D	MK	087100	⚡
2 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100	
1 Fail Secure Lock	ML20906-SEC NSA M92 LC	626C	RU	087100	⚡
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100	
1 Door Closer	DC3200 A10	689	RU	087100	
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D- MS	RO	087100	
1 Armor Plate	K1050 36" X 2" LDW CSK	US32D- MS	RO	087100	
1 Wall Stop	409	US26D	RO	087100	
1 Gasketing	AM88C		PE	087100	
1 Card Reader	Card Reader by Division 281300		HD	281300	⚡
1 ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100	⚡
1 ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)		MK	087100	⚡
1 Position Switch	DPS-M-BK		SU	087100	⚡
1 Power Supply	AQD (Amperage as Required) - By Division 281300		SU	087100	⚡
1 Diagrams	Riser and Wiring Diagrams		OT		

Notes:

Operational Description: Door is normally closed and locked. Presenting a valid credential to the reader will momentarily unlock the lever. Entry also by mechanical key override. Free egress at all times. Request to exit switch shunts alarm upon exiting. Door position switch reports status of door to access control system. Device is fail secure, upon power failure the door will remain locked.

Set: 22.0

Doors: [6-145](#)

087100-40

Description: EVS - KEYPAD LOCK - RA CLOSER X SOHS - KP - MP - SG

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Access Control Mort Lock	AUR3 NTM627-NR LC	626	YA	281500 ⚡
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Surf Overhead Stop	10-X36	630	RF	087100
1 Door Closer	DC3200 A10	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Gasketing	AM88C		PE	087100

Notes:

Operational Description: Door is normally closed and locked. Entering a valid code into the keypad will momentarily unlock the lever. Entry also by mechanical key override. Free egress at all times.

Set: 23.0

Doors: 6-115, 6-123

Description: UNEQUAL PAIRS - BAR. PATIENT ROOMS - HOSPITAL LATCH - SOHS - KP - MP - SG - AST

6 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Self Latching Flush Bolt (Top Only)	2905	US32D	RO	087100
1 Passage Latch	HP3010 HPSK M38 (Backset as Required)	630C	RU	087100
2 Surf Overhead Stop	10-X36	630	RF	087100
2 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
2 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Gasketing	AM88C		PE	087100
1 Astragal	S772BL		PE	087100

Notes:

*Provide backset of hospital latch to match existing hospital standards.

Set: 24.0

Doors: 6-115T, 6-123T

Description: UNEQUAL PAIRS - BAR. PATIENT TOILETS - PRIVACY HOSPITAL LATCH - SOHS - KP - MP - SG - AST

6 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Self Latching Flush Bolt (Top Only)	2905	US32D	RO	087100
1 Privacy Lock	HP3020 HPSK M38 (Backset as	630C	RU	087100
	087100-41			

	Required)			
2 Surf Overhead Stop	10-X36	630	RF	087100
2 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
2 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Gasketing	AM88C		PE	087100
1 Astragal	S772BL		PE	087100

Notes:

*Provide backset of hospital latch to match existing hospital standards.

Set: 25.0

Doors: 6-118Y

Description: PAIR - EXISTING SHELL SPACE - PASSAGE TRIM SVR LBR EXIT DEVICES - PA CLOSERS X STOP ARM - KP - MP - SG - AST

6 Hinge, Full Mortise, Hvy Wt	T4A3786 4-1/2" x 4-1/2"	US26D	MK	087100
2 Surface Vert Rod Exit, Passage	ED5470 N910ET M55	626C	RU	087100
2 Surface Closer	DC3210 A4	689	RU	087100
2 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
2 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Gasketing	AM88C		PE	087100
2 Astragal	18041CNB		PE	087100

Notes:

Set: 26.0

Doors: 6-137, 6-137A

Description: DOUBLE EGRESS PAIRS - ELR SVR LBR EO EXIT DEVICES - AUTO OPERATOR - AP - SG - AST

2 Continuous Hinge	HG305 WHI CTP	630	MR	087100
2 Surface Vert Rod Exit, Exit Only	ED5470 EO M55 MELR	630C	RU	087100 ⚡
2 Automatic Operator	Match Existing Hospital Standards		OT	⚡
2 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
2 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100
2 Astragal	18041CNB		PE	087100
2 ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100 ⚡
2 ElectroLynx Harness	QC-CXXP (Length as Required -		MK	087100 ⚡

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1 Power Supply	Hinge to Device) AQD (Amperage as Required) - By Division 281300		SU	087100	⚡
1 Diagrams	Riser and Wiring Diagrams		OT		
2 Electric Power Transfer	EL-CEPT	630	SU	087100	⚡

Notes:

Operational Description: Doors are normally closed and latched. Free egress in both directions. Assisted entry / exit by waving hand in front of motion sensor actuator will trigger the auto operators to open both doors.

Set: 27.0

Doors: **6-175**

Description: DOUBLE EGRESS PAIR - ELR SVR LBR EO EXIT DEVICES - AUTO OPERATOR - KP - SG - AST - FIRE RATED

2 Continuous Hinge	HG305 WHI CTP	630	MR	087100	
2 Fire Rated Surf Vert Rod, Exit Only	ED5470B EO M55 MELR	630C	RU	087100	⚡
2 Automatic Operator	Match Existing Hospital Standards		OT		⚡
2 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100	
2 Wall Stop	409	US26D	RO	087100	
1 Gasketing	AM88C		PE	087100	
2 Astragal	18041CNB		PE	087100	
2 ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100	⚡
2 ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)		MK	087100	⚡
1 Power Supply	AQD (Amperage as Required) - By Division 281300		SU	087100	⚡
1 Diagrams	Riser and Wiring Diagrams		OT		
2 Electric Power Transfer	EL-CEPT	630	SU	087100	⚡

Notes:

Operational Description: Doors are normally closed and latched. Free egress in both directions. Assisted entry / exit by waving hand in front of motion sensor actuator will trigger the auto operators to open both doors.

Set: 28.0

Doors: **MISC ITEMS**

Description: MISC ACCESS CONTROL ITEMS

1 Repair Kit	QC-R001		MK	087100	⚡
1 Extractor Tool	QC-R002		MK	087100	⚡
1 Crimp Tool	QC-R003		MK	087100	⚡

087100-43

Notes:

Set: 29.0

Doors: [E-ES1](#)

Description: EXISTING OPENING

1 Hardware	Existing Hardware to Remain	OT
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Set: 30.0

Doors: [6-135](#)

Description: CONFERENCE - PASSAGE SET - KP - WS - SG

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Passage Latch	ML2010 NSA	626C	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100

Set: 31.0

Doors: [6-144](#)

Description: LOUNGE - PASSAGE SET - PA CLOSER X STOP ARM - KP - SG

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Passage Latch	ML2010 NSA	626C	RU	087100
1 Surface Closer	DC3210 A4	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Gasketing	AM88C		PE	087100

Set: 32.0

Doors: [6-102T](#), [6-103T](#), [6-104T](#), [6-106T](#), [6-107T](#)

Description: PATIENT ROOMS - HOSPITAL LATCH - SOHS - KP - MP - SG

3 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
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087100-44

1	Passage Latch	HP3010 HPSK M38 (Backset as Required)	630C	RU	087100
1	Surf Overhead Stop	10-X36	630	RF	087100
1	Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1	Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1	Gasketing	AM88C		PE	087100

Notes:

*Provide backset of hospital latch to match existing hospital standards.

Set: 33.0

Doors: 6-108T, 6-109T, 6-110T, 6-111T, 6-112T, 6-113T, 6-114T, 6-115T, 6-116T, 6-117T

Description: PATIENT TOILETS - PRIVACY HOSPITAL LATCH - SOHS - KP - MP - SI

3	Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1	Privacy Lock	HP3020 HPSK M38 (Backset as Required)	630C	RU	087100
1	Surf Overhead Stop	10-X36	630	RF	087100
1	Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1	Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
3	Silencer	608-RKW		RO	087100

Notes:

*Provide backset of hospital latch to match existing hospital standards.

Set: 34.0

Doors: 6-157

Description: SINGLE STALL RESTROOM - PRIVACY LOCK W/ OCC INDICATOR - PA CLOSER - KP - MP - SG

3	Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1	Privacy Lock	ML2030 NSA M34 V21	626C	RU	087100
1	Surface Closer	DC3210 A3	689	RU	087100
1	Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1	Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1	Wall Stop	409	US26D	RO	087100
1	Gasketing	AM88C		PE	087100
1	Coat Hook	RM802	US26D	RO	087100

Set: 35.0

087100-45

Doors: 6-143T, 6-145T

Description: SINGLE STALL RESTROOM - PRIVACY LOCK W/ OCC INDICATOR - RA CLOSER - KP - MP - SG

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Privacy Lock	ML2030 NSA M34 V21	626C	RU	087100
1 Door Closer	DC3200 A10	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100
1 Coat Hook	RM802	US26D	RO	087100

Set: 36.0

Doors: 6-137, 6-140, 6-150

Description: OFFICES - OFFICE LOCK - KP - WS - SG

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Entrance Lock	ML2054 NSA LC	626C	RU	087100
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100

Set: 37.0

Doors: 6-124, 6-126

Description: STAFF TOILETS - STOREROOM LOCK W/ OCC INDICATOR - RA CLOSER - KP - MP - WS - SG - CH

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Security Storeroom Lock	ML2059 NSA M34 V21 LC	626C	RU	087100
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Door Closer	DC3200 A10	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100
1 Coat Hook	RM802	US26D	RO	087100

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Set: 38.0

Doors: 6-154

Description: ELECTRICAL ROOM - STOREROOM LOCK - RA CLOSER - KP - WS - SG - FIRE RATED

3 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Storeroom Lock	ML2057 NSA LC	626C	RU	087100
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Door Closer	DC3200 A10	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100

Set: 39.0

Doors: 6-145L

Description: LINEN ROOM - STOREROOM LOCK - RA CLOSER - KP - WS - SG - 3670

3 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Storeroom Lock	ML2057 NSA LC	626C	RU	087100
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Door Closer	DC3200 A10	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100

Set: 40.0

Doors: 6-125, 6-130, 6-136, 6-143A, 6-145A, 6-145B, 6-152, 6-155A, 6-155B

Description: NOUR / DATA / LOCKER / LOUNGE - CR - FAIL SECURE LOCK - RA CLOSER - KP - MP - WS - SG

2 Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100
1 Electric Hinge	TA2714-QCXX 4-1/2" x 4-1/2" (Qty of Wires as Required)	US26D	MK	087100 ⚡
1 Fail Secure Lock	ML20906-SEC NSA M92 LC	626C	RU	087100 ⚡
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
1 Door Closer	DC3200 A10	689	RU	087100
1 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100

1	Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100	
1	Wall Stop	409	US26D	RO	087100	
1	Gasketing	AM88C		PE	087100	
1	Card Reader	Card Reader by Division 281300		HD	281300	⚡
1	ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100	⚡
1	ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)		MK	087100	⚡
1	Position Switch	DPS-M-BK		SU	087100	⚡
1	Power Supply	AQD (Amperage as Required) - By Division 281300		SU	087100	⚡
1	Diagrams	Riser and Wiring Diagrams		OT		

Notes:

Operational Description: Door is normally closed and locked. Presenting a valid credential to the reader will momentarily unlock the lever. Entry also by mechanical key override. Free egress at all times. Request to exit switch shunts alarm upon exiting. Door position switch reports status of door to access control system. Device is fail secure, upon power failure the door will remain locked.

Set: 41.0

Doors: [6-133](#), [6-143B](#)

Description: CORR / LOCKERS - CR - FAIL SECURE LOCK - PA CLOSER - KP - MP - WS - SG

2	Hinge, Full Mortise	TA2714 4 1/2" x 4 1/2"	US26D	MK	087100	
1	Electric Hinge	TA2714-QCXX 4-1/2" x 4-1/2" (Qty of Wires as Required)	US26D	MK	087100	⚡
1	Fail Secure Lock	ML20906-SEC NSA M92 LC	626C	RU	087100	⚡
1	Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100	
1	Surface Closer	DC3210 A3	689	RU	087100	
1	Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100	
1	Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100	
1	Wall Stop	409	US26D	RO	087100	
1	Gasketing	AM88C		PE	087100	
1	Card Reader	Card Reader by Division 281300		HD	281300	⚡
1	ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100	⚡
1	ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)		MK	087100	⚡
1	Position Switch	DPS-M-BK		SU	087100	⚡
1	Power Supply	AQD (Amperage as Required) - By Division 281300		SU	087100	⚡
1	Diagrams	Riser and Wiring Diagrams		OT		

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Notes:

Operational Description: Door is normally closed and locked. Presenting a valid credential to the reader will momentarily unlock the lever. Entry also by mechanical key override. Free egress at all times. Request to exit switch shunts alarm upon exiting. Door position switch reports status of door to access control system. Device is fail secure, upon power failure the door will remain locked.

Set: 42.0

Doors: [6-129](#), [6-134](#), [6-148](#), [6-153](#)

Description: EQP / CLEAN SUPPLY / SOIL HOLD - CR - FAIL SECURE LOCK - RA CLOSER - AP - MP - WS - SG - FIRE RATED - 4070

1 Electric Hinge, Hvy Wt	T4A3786-QCXX 5" x 4-1/2" (Qty of Wires as Required)	US26D	MK	087100	⚡
2 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100	
1 Fail Secure Lock	ML20906-SEC NSA M92 LC	626C	RU	087100	⚡
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100	
1 Door Closer	DC3200 A10	689	RU	087100	
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100	
1 Armor Plate	K1050 F 36" X 2" LDW CSK	US32D-MS	RO	087100	
1 Wall Stop	409	US26D	RO	087100	
1 Gasketing	AM88C		PE	087100	
1 Card Reader	Card Reader by Division 281300		HD	281300	⚡
1 ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100	⚡
1 ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)		MK	087100	⚡
1 Position Switch	DPS-M-BK		SU	087100	⚡
1 Power Supply	AQD (Amperage as Required) - By Division 281300		SU	087100	⚡
1 Diagrams	Riser and Wiring Diagrams		OT		

Notes:

Operational Description: Door is normally closed and locked. Presenting a valid credential to the reader will momentarily unlock the lever. Entry also by mechanical key override. Free egress at all times. Request to exit switch shunts alarm upon exiting. Door position switch reports status of door to access control system. Device is fail secure, upon power failure the door will remain locked.

Set: 43.0

Doors: [6-147](#)

Description: EVS / TRASH HOLDING - KEYPAD LOCK - RA CLOSER - AP - MP - WS - SG - FIRE RATED - 4070

3 Hinge, Full Mortise, Hvy Wt 087100-49	T4A3786 5" x 4-1/2"	US26D	MK	087100	
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1 Access Control Mort Lock	AUR3 NTM627-NR LC	626	YA	281500	⚡
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100	
1 Door Closer	DC3200 A10	689	RU	087100	
1 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100	
1 Armor Plate	K1050 F 36" X 2" LDW CSK	US32D-MS	RO	087100	
1 Wall Stop	409	US26D	RO	087100	
1 Gasketing	AM88C		PE	087100	

Notes:

Operational Description: Door is normally closed and locked. Entering a valid code into the keypad will momentarily unlock the lever. Entry also by mechanical key override. Free egress at all times.

Set: 44.0

Doors: [6-105](#), [6-114](#)

Description: UNEQUAL PAIRS - BAR. PATIENT ROOMS - HOSPITAL LATCH - SOHS - KP - MP - SG - SW - AST

6 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Self Latching Flush Bolt (Top Only)	2905	US32D	RO	087100
1 Passage Latch	HP3010 HPSK M38 (Backset as Required)	630C	RU	087100
2 Surf Overhead Stop	10-X36	630	RF	087100
2 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
2 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Gasketing	AM88C		PE	087100
2 Sweep	18061CNB		PE	087100
1 Astragal	S772BL		PE	087100

Notes:

*Provide backset of hospital latch to match existing hospital standards.

Set: 45.0

Doors: [6-101T](#), [6-105T](#), [6-118T](#)

Description: UNEQUAL PAIRS - BAR. PATIENT TOILETS - PRIVACY HOSPITAL LATCH - SOHS - KP - MP - SG - AST

6 Hinge, Full Mortise, Hvy Wt	T4A3786 5" x 4-1/2"	US26D	MK	087100
1 Self Latching Flush Bolt (Top Only)	2905	US32D	RO	087100
1 Privacy Lock	HP3020 HPSK M38 (Backset as Required)	630C	RU	087100
2 Surf Overhead Stop	10-X36	630	RF	087100

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2 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100
2 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
1 Gasketing	AM88C		PE	087100
1 Astragal	S772BL		PE	087100

Notes:

*Provide backset of hospital latch to match existing hospital standards.

Set: 46.0

Doors: [6-146](#), [6-151B](#)

Description: PAIRS - CR - ELR SVR LBR NL X EO EXIT DEVICES X PULLS - AUTO OPERATOR - AP - MP - SG - AST

2 Continuous Hinge	HG305 WHI CTP	630	MR	087100
1 Surface Vert Rod Exit, Nightlatch	ED5470 K157ET M55 M92 MELR	630C	RU	087100 ⚡
1 Surface Vert Rod Exit, Exit Only	ED5470 EO M55 M92 MELR	630C	RU	087100 ⚡
1 Cylinder	Medeco Type as Required (Match Existing Key System)	26	MC	087100
2 Pull	RM202 Mtg-Type 12XHD	US32D-316	RO	087100
2 Automatic Operator	Match Existing Hospital Standards		OT	⚡
2 Mop Plate	K1050 6" x 1" LDW X CSK	US32D-MS	RO	087100
2 Armor Plate	K1050 36" X 2" LDW CSK	US32D-MS	RO	087100
2 Wall Stop	409	US26D	RO	087100
1 Gasketing	AM88C		PE	087100
2 Astragal	18041CNB		PE	087100
1 Card Reader	Card Reader by Division 281300		HD	281300 ⚡
2 ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100 ⚡
2 ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)		MK	087100 ⚡
2 Position Switch	DPS-M-BK		SU	087100 ⚡
1 Power Supply	AQD (Amperage as Required) - By Division 281300		SU	087100 ⚡
1 Diagrams	Riser and Wiring Diagrams		OT	
2 Electric Power Transfer	EL-CEPT	630	SU	087100 ⚡

Notes:

Operational Description: Doors are normally closed and locked. Presenting a valid credential to the reader will momentarily retract the latchbolts of the exit devices and trigger the automatic operator to open both doors. Entry also by mechanical key override. Free egress at all times. Request to exit switch shunts 087100-51

alarm upon exiting. Door position switch reports status of door to access control system. Device is fail secure, upon power failure the door will remain locked.

Set: 47.0

Doors: **6-151A**

Description: DOUBLE EGRESS PAIRS - ELR SVR LBR EO EXIT DEVICES - AUTO OPERATOR - AP - SG - AST

2	Continuous Hinge	HG305 WHI CTP	630	MR	087100	
2	Surface Vert Rod Exit, Exit Only	ED5470 EO M55 MELR	630C	RU	087100	⚡
2	Automatic Operator	Match Existing Hospital Standards		OT		⚡
2	Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100	
2	Wall Stop	409	US26D	RO	087100	
1	Gasketing	AM88C		PE	087100	
2	Astragal	18041CNB		PE	087100	
2	ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100	⚡
2	ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)		MK	087100	⚡
1	Power Supply	AQD (Amperage as Required) - By Division 281300		SU	087100	⚡
1	Diagrams	Riser and Wiring Diagrams		OT		
2	Electric Power Transfer	EL-CEPT	630	SU	087100	⚡

Notes:

Operational Description: Doors are normally closed and latched. Free egress in both directions. Assisted entry / exit by waving hand in front of motion sensor actuator will trigger the auto operators to open both doors.

Set: 48.0

Doors: **6-151C**

Description: DOUBLE EGRESS PAIR - ELR SVR LBR EO EXIT DEVICES - AUTO OPERATOR - AP - SG - AST - FIRE RATED

2	Continuous Hinge	HG305 WHI CTP	630	MR	087100	
2	Fire Rated Surf Vert Rod, Exit Only	ED5470B EO M55 MELR	630C	RU	087100	⚡
2	Automatic Operator	Match Existing Hospital Standards		OT		⚡
2	Armor Plate	K1050 F 36" X 2" LDW CSK	US32D-MS	RO	087100	
2	Wall Stop	409	US26D	RO	087100	
1	Gasketing	AM88C		PE	087100	
2	Astragal	18041CNB		PE	087100	
2	ElectroLynx Harness	QC-C1500 (Power Supply to Hinge / Device)		MK	087100	⚡

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2 ElectroLynx Harness	QC-CXXP (Length as Required - Hinge to Device)		MK	087100	⚡
1 Power Supply	AQD (Amperage as Required) - By Division 281300		SU	087100	⚡
1 Diagrams	Riser and Wiring Diagrams		OT		
2 Electric Power Transfer	EL-CEPT	630	SU	087100	⚡

Notes:

Operational Description: Doors are normally closed and latched. Free egress in both directions. Assisted entry / exit by waving hand in front of motion sensor actuator will trigger the auto operators to open both doors.

Set: 49.0

Doors: [6-121](#)

Description: DOUBLE EGRESS PAIR - SVR LBR EO EXIT DEVICES - MHO - KP - SG - AST - FIRE RATED

2 Continuous Hinge	HG305 WHI	630	MR	087100	
2 Fire Rated Surf Vert Rod, Exit Only	ED5470B EO M55	630C	RU	087100	
2 Surface Closer	DC3210 A3	689	RU	087100	
2 Kick Plate	K1050 10" x 2" LDW X CSK	US32D-MS	RO	087100	
2 Wall Stop	409	US26D	RO	087100	
2 Electromagnetic Holder	998M	689	RF	087100	⚡
1 Gasketing	AM88C		PE	087100	
2 Astragal	18041CNB		PE	087100	
1 Power Supply	AQD (Amperage as Required) - By Division 281300		SU	087100	⚡
1 Diagrams	Riser and Wiring Diagrams		OT		

Notes:

Operational Description: Doors are normally held open via the magnetic hold opens. Upon power failure or activation of the fire alarm the doors will close and latch. Free egress at all times in both directions.

Set: 50.0

Doors: [6-E-001](#), [6-E-002](#), [6-E-STR](#)

Description: EXISTING OPENINGS

1 Hardware	Existing Hardware to Remain		OT		
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Set: 51.0

Doors: 6-101, 6-102, 6-103, 6-104, 6-106, 6-107A, 6-108, 6-109, 6-110, 6-111, 6-112, 6-113, 6-115, 6-116, 6-117, 6-118

Description: SLIDING ALUMINUM DOORS

1 Hardware	All Hardware by Door / Frame Manufacturer	OT
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END OF SECTION 087100

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WIER BOERNER ALLIN
08-12-2024

- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.
6. PROTECTION
- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Glazing units.
 - B. Glazing compounds and accessories.
2. RELATED REQUIREMENTS
 - A. Section 08.1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.
 - B. Section 08.1416 - \afs32\fs32 FLUSH WOOD DOORS: Glazed lites in doors.
 - C. Section 08.4313 - Aluminum-Framed Storefronts: Glazing furnished as part of storefront assembly.
 - D. Section 08.4413 - Glazed Aluminum Curtain Walls: Glazing furnished as part of wall assembly.
 - E. Section 08.5113 - Aluminum Windows: Glazing furnished by window manufacturer.
3. 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; 2010.
 - C. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2011).
 - D. ASTM C1036 - Standard Specification for Flat Glass; 2011.
 - E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.
 - F. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2014.
 - G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).
 - H. GANA (GM) - GANA Glazing Manual; 2009.
 - I. GANA (SM) - GANA Sealant Manual; 2008.
 - J. GANA (LGRM) - Laminated Glazing Reference Manual; 2009.
 - K. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (2004).
4. ADMINISTRATIVE REQUIREMENTS
 - A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.
 - B. Delivery and Storage: Deliver glazing to site with manufacturer's labels attached to each piece. Do not remove labels until material has been approved in place. Protect stored material per the manufacturer's written instructions and as needed to prevent damage from condensation, temperature changes, direct exposure to sunlight or other causes until ready for installation.
5. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data on Glazing Unit 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. Identify available colors.
 - D. Samples: Submit two samples 12 by 12 inch (304.8 by 304.8 mm) in size of all glazed units and film types.
 - E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
6. 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. Source limitations for Glass: Obtain the following through one source from a single manufacturer for each glass type.
 - 1. Obtain tinted glass and reflective coated glass from single source from single manufacturer.
 - 2. Obtain glazing accessories from single source from single manufacturer for each product and installation method.
 - C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
 - D. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.
7. FIELD CONDITIONS
- A. Do not install glazing when ambient temperature is less than 40 degrees F (4 degrees C).
 - B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.
8. WARRANTY
- A. See Section 01.7800 - Closeout Submittals, 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.

PART 2 PRODUCTS

1. MANUFACTURERS

- A. Float Glass Manufacturers:
 - 1. Pilkington North America Inc: www.pilkington.com/na.
 - 2. PPG Industries, Inc: www.ppgideascape.com.
 - 3. Substitutions: Refer to Section 01.6000 - Product Requirements.
- B. Wired Glass Manufacturers:
 - 1. GGI - General Glass International; Wire Glass: www.generalglass.com/#sle.
 - 2. Substitutions: Refer to Section 01.6000 - Product Requirements.

2. GLASS MATERIALS

- A. Float Glass: Provide float glass based glazing unless noted otherwise.
 - 1. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and FT.
 - a. Kind HS: Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1) Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
 - a) Roll-Wave Distortion Limits: Maximum peak to valley deviation of 0.003 inch in center field of lite, and 0.008 inch within 10.5 inches of leading and trailing edges.
 - b) Millidiopter: Plus or minus 100 mD over 95 percent of glass surface.
 - c) Overall Bow/Warp, Maximum: ASTM C 1048 Table 2 requirements, but not exceeding 0.50-inch regardless of edge dimension.
 - d) Maintain measurement documentation for each lite. Upon request provide documentation for verification.
 - 2. Fully Tempered Safety Glass: Complies with ANSI Z97.1 and 16 CFR 1201 criteria.
 - 3. Safety Wired Glass Type: ASTM C1036, Type II - Wired Flat Glass, Quality-Q5, ANSI Z97.1 and 16 CFR 1201 impact criteria for Class B/Category I, and color and performance characteristics as indicated.
- B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.

1. Laminated Safety Glass: Complies with ANSI Z97.1 and 16 CFR 1201 test requirements for Category II.
 - a. Use Material that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 - b. Conststruction: Unless otherwise indicated, laminate glass with polyvinyl butyral interlayer or ionomeric polymer interlayer to comply with manufacturer's written instructions.
 - c. Interlayer thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
3. GLAZING UNITS
 - A. Type 5 - Monolithic Interior Vision Glazing:
 1. Applications: As scheduled.
 2. Glass Type: Fully tempered float glass.
 3. Tint: Clear.
 4. Thickness: 1/4 inch (6.4 mm), nominal.
 5. Glazing Method: Dry glazing method, tape and tape.
 - B. Type 6 - Monolithic Interior Vision Glazing:
 1. Applications: Interior glazing unless otherwise indicated.
 2. Glass Type: Fully tempered float glass.
 3. Tint: Clear.
 4. Thickness: 3/8 inch (9.5 mm), nominal.
 5. Glazing Method: Dry glazing method, tape and tape.
 - C. Type 7 - Impact Resistance Glazing: Clear Laminated glass, 2-Ply.
 1. Applications: Locations as indicated on drawings.
 2. Tint: Clear.
 3. Thickness: 1/2 inch (12.7 mm), minimum 6mm each layer.
 4. Outside Lite: Heat-strengthened glass.
 5. Interlayer: Polyvinyl butyral (PVB) at 0.060 inch minimum thickness, or Ionomeric Polymer (required at structural sealant, butt glazing and glass with exposed edges at suite fronts) at 0.030 inch minimum thickness; thickness as required to meet performance criteria.
 6. Inside Lite: Heat-strengthened glass.
 7. Winter Nighttime -Factor: 0.96 maximum
 8. Summer Daytime U-Factor: 0.87 maximum
 9. Visible Light Transmittance (VLT): 85 percent, minimum.
 10. Solar Heat Gain Coefficient (SHGC): 0.71 percent, maximum.
 11. Safety Glazing required.
 12. Non Reflective.
 13. Glazing Method: As required to meet performance criteria.
 - D. Type 8 - Safety Wired Glazing: Flat glass with embedded wire mesh.
 1. Applications: Locations as indicated on drawings.
 2. Form: Form 1 - Wired glass, polished both sides; ASTM C1036.
 3. Mesh: M1 - Diamond; ASTM C1036.
 4. Tint: Clear, Class 1.
 5. Glass Type: Annealed.
 6. Thickness: 1/4 inch (6.4 mm), nominal.
 7. Glazing Method: Wet glazing method, compound and compound.
 - E. Type G-14 - Direct to Glass Ceramic Printing: Ceramic frit is fused into glass creating permanent designs.

1. Applications: Locations as indicated on drawings.
 2. Glass Type: Fully tempered; monolithic glass system.
4. 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 (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) x width of glazing rabbet space minus 1/16 inch (1.5 mm) x 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 (75 mm) long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
 - C. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

PART 3 EXECUTION

1. 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. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.
2. 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. 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. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.
4. 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 (152 mm) 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.
5. INSTALLATION - PRESSURE GLAZED SYSTEMS
 - A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
 - B. Place setting blocks at 1/4 points with edge block no more than 6 inch (152 mm) from corners.

- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
 - D. Install pressure plates without displacing glazing gasket; exert pressure for full continuous contact.
 - E. Install cover plate.
6. INSTALLATION - PLASTIC FILM
- A. Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.
 - B. Place without air bubbles, creases or visible distortion.
 - C. Install film tight to perimeter of glass and carefully trim film with razor sharp knife. Provide 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) gap at perimeter of glazed panel unless otherwise required. Do not score the glass.
7. FIELD QUALITY CONTROL
- A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
 - B. Monitor and report installation procedures and unacceptable conditions.
8. CLEANING
- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
 - B. Remove non-permanent labels immediately after glazing installation is complete.
 - C. Clean glass and adjacent surfaces after sealants are fully cured.
 - D. 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.
9. 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.

END OF SECTION

Gypsum Board Assemblies

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Performance criteria for gypsum board assemblies.
 - B. Metal stud wall framing.
 - C. Metal channel ceiling framing.
 - D. Cementitious backing board.
 - E. Gypsum wallboard.
 - F. Joint treatment and accessories.
 - G. Acoustic (sound-dampening) wall and ceiling board.
2. RELATED REQUIREMENTS
 - A. Section 05.4000 - Cold-Formed Metal Framing: Exterior wind-load-bearing metal stud framing.
 - B. Section 06.1000 - Rough Carpentry: Wood blocking product and execution requirements.
 - C. Section 07.2100 - Thermal Insulation: Acoustic insulation.
 - D. Section 07.9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
3. REFERENCE STANDARDS
 - A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
 - B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).
 - 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; 2023.
 - E. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.
 - F. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board; 2004 (Reapproved 2014).
 - G. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2009).
 - H. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014.
 - I. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015.
 - J. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.
 - 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; 2015.
 - L. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.
 - M. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.
 - N. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2022, with Editorial Revision (2023).
 - O. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
 - P. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

- Q. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
 - R. ASTM E413 - Classification for Rating Sound Insulation; 2010.
 - S. GA-216 - Application and Finishing of Gypsum Board; 2013.
 - T. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2008.
 - U. GA-600 - Fire Resistance Design Manual; 2015.
4. ADMINISTRATIVE REQUIREMENTS
- A. Deliver all materials in their unopened packages and stored in enclosed shelter providing protection damage and exposure to the elements.
5. SUBMITTALS
- A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
 - C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
6. QUALITY ASSURANCE
- A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 5 years of documented experience.

PART 2 PRODUCTS

1. GYPSUM BOARD ASSEMBLIES
- A. Provide completed assemblies complying with ASTM C840 and GA-216.
 - B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
 - 1. Acoustic Attenuation: STC as indicated calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
2. METAL FRAMING MATERIALS
- A. Manufacturers - Metal Framing, Connectors, and Accessories:
 - 1. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
 - 2. Marino: www.marinoware.com.
 - 3. Substitutions: See Section 01.6000 - Product Requirements.
 - B. Non-Loadbearing 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 (L/120 at 240 Pa).
 - 1. Studs: "C" shaped with flat or formed webs.
 - 2. Runners: U shaped, sized to match studs.
 - 3. Ceiling Channels: C-shaped.
 - 4. Furring: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).
 - 5. Resilient Furring Channels: 1/2 inch (12 mm) depth, for attachment to substrate through both legs; both legs expanded metal mesh.
 - C. Loadbearing Studs for Application of Gypsum Board: As specified in Section 05.4000.
 - D. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
 - E. 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 S100-12.

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-rated head of partition joint systems of fire rating and movement required.
 4. Deflection and Firestop Track:
 - a. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
3. BOARD MATERIALS
- A. Manufacturers - Gypsum-Based Board:
 1. CertainTeed Corporation: www.certainteed.com.
 2. Georgia-Pacific Gypsum: www.gpgypsum.com.
 3. National Gypsum Company: www.nationalgypsum.com.
 4. USG Corporation: www.usg.com.
 5. Substitutions: See Section 01.6000 - Product Requirements.
 - B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - a. Mold resistant board is required at all wallboard installed at exterior walls, all wet walls and all walls within restrooms typical..
 3. Thickness:
 - a. Vertical Surfaces: 5/8 inch (16 mm).
 - b. Ceilings: 1/2 inch (13 mm).
 - c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
 4. Mold Resistant Paper Faced Products:
 - a. American Gypsum Company; M-Bloc Type X.
 - b. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard.
 - C. Backing Board For Wet Areas: One of the following products:
 1. Application: Surfaces behind tile in wet areas including tub and shower surrounds, shower ceilings, and other areas indicated.
 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
 - a. Thickness: 1/2 inch (12.7 mm).
 - D. Backing 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: Vertical surfaces behind thinset tile, except in wet areas.
 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 3. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
 4. Type: Regular and Type X, in locations indicated.
 5. Type X Thickness: 5/8 inch (16 mm).
 6. Regular Board Thickness: 5/8 inch (16 mm).
 7. Edges: Tapered.
 - E. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

1. Application: Ceilings, unless otherwise indicated.
 2. Thickness: 1/2 inch (13 mm).
 3. Edges: Tapered.
4. ACCESSORIES
- A. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
 1. Products:
 - a. Franklin International, Inc; Titebond GREENchoice Professional Acoustical Smoke and Sound Sealant: www.titebond.com/#sle.
 - b. Liquid Nails, a brand of PPG Architectural Coatings; AS-825 Acoustical Sound Sealant: www.liquidnails.com/#sle.
 - c. Substitutions: See Section 01.6000 - Product Requirements.
 - B. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
 1. Types: As detailed or required for finished appearance.
 - C. Beads, Joint Accessories, and Other Trim: ASTM C1047, rolled zinc, unless noted otherwise.
 1. Rigid Corner Beads: Low profile, for 90 degree outside corners.
 2. Architectural Reveal Beads:
 - a. Reveal Depth: 1/2 inch (12 mm).
 - b. Reveal Width: 1/2 inch (12 mm).
 - c. Shapes: As indicated on drawings.
 3. Expansion Joints:
 - a. Type: V-shaped metal with factory-installed protective tape.
 - D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 1. Tape: 2 inch (50 mm) wide, creased paper tape for joints and corners, except as otherwise indicated.
 2. Ready-mixed vinyl-based joint compound.
 - E. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch (0.84 mm) in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
 - F. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws, corrosion resistant.
 - G. Nails for Attachment to Wood Members: ASTM C514.
 - H. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.
 - I. Adhesive for Attachment to Wood ASTM C557 and Wood ASTM C557:

PART 3 EXECUTION

1. EXAMINATION
 - A. Verify that project conditions are appropriate for work of this section to commence.
2. 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 using the appropriate framing option at 16 inches on center (at 400 mm on center) and as detailed below.
 1. Framing Options:
 - a. Option 1: Install 1-1/2" carrying channels at 48" o.c. to structure using hanger wire. Install furring channels perpendicular to carrying channels at 16" o.c. attached. Attach with channel

- clips installed on alternating sides of the carrying channel.
- b. Option 2: Install drywall formed steel cold rolled, heavy duty, suspension system, complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter molding, and hold clips as required.
 - 1) Construction: Cross Tee; 1-1/2" width, double web.
 - 2) Space main beams and cross beams per manufacturer's recommendation to meet performance and level requirements.
- c. Option 3: Install drywall framing system using stud and other cold rolled shapes spanning from stud partitions to stud partitions. Size depth of members to span to meet level and deflection requirements listed.
 - 2. Level ceiling system to a tolerance of 1/1200.
 - 3. Laterally brace entire suspension system.
- C. Studs: Space studs as scheduled.
 - 1. Extend partition framing to structure where indicated and to ceiling in other locations.
 - 2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
 - 3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- E. Standard Wall Furring: Install at concrete and masonry walls scheduled to receive gypsum board, not more than 4 inches (100 mm) from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches (600 mm) on center.
 - 1. Orientation: Vertical.
 - 2. Spacing: As indicated.
- F. Acoustic Furring: Install resilient channels at maximum 24 inches (600 mm) on center. Locate joints over framing members.
- G. Framing and Furring for Utility Enclosure: Install furring where indicated in drawings to enclose new utilities. Use minimum 3 5/8" metal framing and 5/8" gyp board at all exposed surfaces.
- H. Framing and Furring for Fire Ratings: Install as required for fire resistance ratings indicated and to GA-600 requirements.
- I. Blocking: Install wood blocking for support of:
 - 1. Wall mounted cabinets.
 - 2. Plumbing fixtures.
 - 3. Toilet partitions.
 - 4. Toilet accessories.
 - 5. Wall mounted door hardware.
 - 6. Wall mounted Televisions, Monitor and other electronic devices (provided by Owner).
 - 7. Owner provided signage.
 - 8. See drawings for locations of all items above.
- 3. 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. Place one bead continuously on substrate before installation of perimeter framing members.
 2. Place continuous bead at perimeter of each layer of gypsum board.
 3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.
4. **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 Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
 - C. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.
 - D. Installation on Metal Framing: Use screws for attachment of gypsum board.
 - E. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For non-rated assemblies, install as follows:
 1. Single-Layer Applications: Adhesive application.
 2. Double-Layer Application: Install base layer using screws at 24" o.c. minimum. Install face layer using 16" o.c..
 - F. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.
5. **INSTALLATION OF TRIM AND ACCESSORIES**
- A. Control Joints: Place control joints consistent with lines of building spaces and as shown in the drawings but:
 1. Not more than 30 feet (10 meters) apart on walls and ceilings over 50 feet (16 meters) long.
 - B. Corner Beads: Install at external corners, using longest practical lengths.
 - C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.
6. **JOINT TREATMENT**
- A. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.
 - B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 2. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 3. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
 - 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 (0.8 mm).
 - D. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.
7. **TOLERANCES**
- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

END OF SECTION

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Tile for floor applications.
 - B. Tile for wall applications.
 - C. Cementitious backer board as tile substrate.
 - D. Stone thresholds.
 - E. Ceramic accessories.
 - F. Non-ceramic trim.
2. RELATED REQUIREMENTS
 - A. Section 07.9200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
 - B. Section 09.2116 - Gypsum Board Assemblies: Tile backer board.
3. REFERENCE STANDARDS
 - A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2014.
 - B. 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; 1999 (Reaffirmed 2010).
 - C. 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 2010).
 - D. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).
 - E. 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).
 - F. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (Reaffirmed 2010).
 - G. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2010).
 - H. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2010).
 - I. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (Reaffirmed 2010).
 - J. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).
 - K. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior glue plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).
 - L. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2010).
 - M. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2012 (Revised).
 - N. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2010 (Revised).
 - O. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2016).

- P. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes For Thin-Set Ceramic Tile And Dimension Stone Installation; 2014.
 - Q. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-set Ceramic Tile and Dimension Stone Installation; 2014.
 - R. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2015.
4. SUBMITTALS
- A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
 - C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
 - D. 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 Tile: 1 percent of each size, color, and surface finish combination, but not less than _____ of each type.
5. DELIVERY, STORAGE, AND HANDLING
- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.
6. FIELD CONDITIONS
- A. Do not install solvent-based products in an unventilated environment.

PART 2 PRODUCTS

1. TILE
- A. Manufacturers: See Appendix A - UMMC Finish Standards for manufacturer.
 - 1. Substitutions: shall be reviewed and approved by UMMC Office of Planning, Design & Construction.
 - B. Manufacturers: As scheduled on Drawings .
 - 1. American Olean Corporation: www.americanolean.com/#sle.
2. TRIM AND ACCESSORIES
- A. Ceramic Accessories: Glazed finish, same color and finish as adjacent field tile; same manufacturer as tile.
 - B. Non-Ceramic Trim: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
 - 1. Applications:
 - a. Open edges of wall tile.
 - b. Open edges of floor tile.
 - c. Wall corners, outside and inside.
 - d. Transition between floor finishes of different heights.
 - e. Expansion and control joints, floor and wall.
 - f. Floor to wall joints.
 - g. Borders and other trim as indicated on drawings.
 - 2. Manufacturers:
 - a. Schluter-Systems: www.schluter.com/#sle.
 - b. Substitutions: See Section 01.6000 - Product Requirements.
 - C. Thresholds: Marble, white or gray, honed finish; 2 inches (51 mm) wide by full width of wall or frame opening; 1/2 inch thick (12.7 mm thick); beveled one long edge with radiused corners on top side; without holes, cracks, or open seams.

1. Applications:
 - a. At doorways where tile terminates.
3. SETTING MATERIALS
 - A. Manufacturers:
 1. ARDEX Engineered Cements; _____: www.ardexamericas.com/#sle.
 2. LATICRETE International, Inc; _____: www.laticrete.com/#sle.
 3. TEC, an H.B. Fuller Construction Products Brand; _____: www.tecspecialty.com/#sle.
 4. Substitutions: See Section 01.6000 - Product Requirements.
 - B. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
 1. Products:
 - a. ARDEX Engineered Cements; ARDEX N 23 MICROTEC: www.ardexamericas.com/#sle.
 - b. TEC, an H.B. Fuller Construction Products Brand; TEC Ultimate Large Tile Mortar: www.tecspecialty.com/#sle.
 - c. Substitutions: See Section 01.6000 - Product Requirements.
4. GROUTS
 - A. Manufacturers:
 1. ARDEX Engineered Cements; _____: www.ardexamericas.com/#sle.
 2. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout: www.laticrete.com/#sle.
 3. TEC, an H.B. Fuller Construction Products Brand; _____: www.tecspecialty.com/#sle.
 4. Substitutions: See Section 01.6000 - Product Requirements.
 - B. Standard Grout: ANSI A118.6 standard cement grout.
 1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
 2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
 3. Color(s): as indicated in Appendix A - UMMC Finish Standards.
 4. Products:
 - a. LATICRETE International, Inc; LATICRETE 1500 Sanded Grout: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01.6000 - Product Requirements.
5. ACCESSORY MATERIALS
 - A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
 1. Type: Fluid-applied.
 2. Thickness: 20 mils (0.5 mm), maximum.
 3. Crack Resistance: No failure at 1/16 inch (1.6 mm) gap, minimum.
 4. Products:
 - a. Substitutions: See Section 01.6000 - Product Requirements.
 - B. Reinforcing Mesh: 2 by 2 inch (51 by 51 mm) size weave of 16/16 wire size; welded fabric, galvanized.
 - C. Underlayment at Floors: Specifically designed for bonding to thin-set setting mortar; not primarily a waterproofing material and having the following characteristics:
 1. Crack Resistance: No failure at 1/16 inch (1.6 mm) gap, minimum; comply with ANSI A118.12.
 2. Water Resistance: Comply with ANSI A118.10, bonded waterproofing.
 3. Type: Fluid or Trowel Applied.
 - D. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 1/2 inch (12.7 mm) thick; 2 inch (51 mm) wide coated glass fiber tape for joints and corners.
 - E. Mesh Tape: 2 inch (50 mm) wide self-adhesive fiberglass mesh tape.

PART 3 EXECUTION

1. EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
- C. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

2. PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.
- E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3. INSTALLATION - GENERAL

- A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install ceramic accessories rigidly in prepared openings.
- G. Install non-ceramic trim in accordance with manufacturer's instructions.
- H. Install thresholds where indicated.
- I. Sound tile after setting. Replace hollow sounding units.
- J. Keep control and expansion joints free of mortar, grout, and adhesive.
- K. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- L. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.
- M. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

4. INSTALLATION - FLOORS - THIN-SET METHODS

- A. Over exterior concrete substrates, install in accordance with TCNA (HB) Method F102, with standard grout.
- B. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.
 - 1. Use uncoupling membrane under all tile unless other underlayment is indicated.

5. INSTALLATION - WALL TILE
 - A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244, using membrane at toilet rooms.
6. CLEANING
 - A. Clean tile and grout surfaces.
7. PROTECTION
 - A. Do not permit traffic over finished floor surface for 2 days after installation.

END OF SECTION

Acoustical Ceilings

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Acoustical units.
2. RELATED REQUIREMENTS
 - A. Section 07.2100 - Thermal Insulation: Acoustical insulation.
 - B. Section 09.2116 - Gypsum Board Assemblies
3. REFERENCE STANDARDS
 - A. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.
 - B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.
 - C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2014.
4. ADMINISTRATIVE REQUIREMENTS
 - A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
 - B. Do not install acoustical units until after interior wet work is dry.
 - C. Store in strict accordance with manufacturer's recommendations.
 - D. Coordinate recessed items which occur in acoustical tile ceilings with layout, bracing and attachments. Locate openings as shown on reflected ceiling drawings, mechanical and electrical drawings and as otherwise indicated.
5. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Shop Drawings: Indicate grid layout and related dimensioning and junctions with other ceiling finishes.
 - C. Product Data: Provide data on suspension system components and acoustical units.
 - D. Samples: Submit two full size samples illustrating material and finish of acoustical units.
 - E. Samples: Submit two samples each, 6 inches (152 mm) long, of suspension system main runner.
 - F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
6. QUALITY ASSURANCE
 - A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
 - B. Suspension System Installer Qualifications: Company specializing in installation of the products specified in this section with minimum five years documented experience.
7. FIELD CONDITIONS
 - A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

1. MANUFACTURERS
 - A. Acoustic Tiles/Panels:
 1. See Appendix A - UMMC Finish Standards for manufacturer.
 2. Substitutions: See Section 01.6000 - Product Requirements.

- a. Substitutions shall be reviewed and approved by UMMC Office of Planning, Design & Construction.
 - B. Suspension Systems:
 - 1. Same as for acoustical units.
- 2. ACOUSTICAL UNITS
 - A. Acoustical Units : See Appendix A - UMMC Finish Standards.
- 3. SUSPENSION SYSTEM(S)
 - A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
 - B. Match existing system.
 - C. Exposed Steel Suspension SystemType 1 | Standard: Formed steel, commercial quality cold rolled; heavy-duty.
 - 1. Profile: Tee; 15/16 inch (24 mm) wide face with rolled cap.
 - 2. Construction: Double web with cross tee holes at 6" O.C. and hanger wire holes at 2" O.C. with internal reversible splice.
 - 3. Finish: White painted.
 - 4. Products:
 - a. Prelude XL by Armstrong.
 - b. Substitutions: See Section 01.6000 - Product Requirements.
 - D. Exposed Steel Suspension SystemType 2 | Upgraded: Formed steel, commercial quality cold rolled; heavy-duty.
 - 1. Profile: Tee; 9/16 inch (14 mm) wide face with rolled cap.
 - 2. Construction: Double web with cross tee holes at 6" O.C. and hanger wire holes at 2" O.C. with internal reversible splice.
 - 3. Finish: White painted.
 - 4. Products:
 - a. Suprafine XL by Armstrong.
 - b. Substitutions: See Section 01.6000 - Product Requirements.
- 4. ACCESSORIES
 - A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
 - B. Wire Ties: No. 12 galvanized wire.
 - C. Perimeter Moldings: Same material and finish as grid.
 - 1. At Exposed Grid: Provide L-shaped and W-shaped molding for mounting at same elevation as face of grid as indicated in the drawings.
 - D. Acoustical Insulation: ASTM C665 friction fit type, unfaced batts.
 - 1. See Specification Section 09.2116 Gypsum Board Assemblies.
 - E. Acoustical Sealant For Perimeter Moldings: Non-hardening, non-skinning, for use in conjunction with suspended ceiling system.
 - F. Hold Down Clips: As required and specified by manufacturer.
 - G. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

- 1. EXAMINATION
 - A. Verify existing conditions before starting work.
 - B. Verify that layout of hangers will not interfere with other work.

2. INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, ASTM C636/C636M, ASTM E580/E580M, ASTM C636/C636M, and ASTM E580/E580M and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- H. Support fixture loads using supplementary hangers located within 6 inches (150 mm) of each corner, or support components independently.
- I. Do not eccentrically load system or induce rotation of runners.
- J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Install in bed of acoustical sealant.
 - 2. Use longest practical lengths.
 - 3. Overlap and rivet corners.

3. INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install units after above-ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 - 1. Make field cut edges of same profile as factory edges.
- G. Where round obstructions occur, provide preformed closures to match perimeter molding.
- H. Lay acoustical insulation for a distance of 48 inches (1200 mm) either side of acoustical partitions.
- I. Install hold-down clips on panels within 20 ft (6 m) of an exterior door and in other locations as required by the manufacturer.

4. TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

5. ATTIC STOCK

- A. Installer to leave the Owner 2% of acoustical tile used, but not less than 1 carton of each type for Owner's use in replacing damaged products.

END OF SECTION

Resilient Flooring

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Resilient tile flooring.
 - B. Resilient base.
 - C. Installation accessories.
2. REFERENCE STANDARDS
 - A. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; October 2011.
3. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
 - C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
4. DELIVERY, STORAGE, AND HANDLING
 - A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
 - B. Store all materials off of the floor in an acclimatized, weather-tight space.
 - C. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).

PART 2 PRODUCTS

1. TILE FLOORING
 - A. Luxury Vinyl Tile (LVT): See Appendix A - UMMC Finish Standards.
 1. Manufacturers:
 - a. Mohawk Group; www.mohawkgroup.com.
2. RESILIENT BASE
 - A. Resilient Base: See Appendix A - UMMC Finish Standards.
3. ACCESSORIES
 - A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
 - B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

1. EXAMINATION
 - A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
 - B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
 - C. Verify that required floor-mounted utilities are in correct location.
2. PREPARATION
 - A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
 - B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
 - C. Prohibit traffic until filler is fully cured.
 - D. Clean substrate.

3. INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install in accordance with manufacturer's written instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Fit joints and butt seams tightly.
- E. Set flooring in place, press with heavy roller to attain full adhesion.
- F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
- H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

4. INSTALLATION - TILE FLOORING

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

5. INSTALLATION - RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 36 inches (____ mm) between joints.
- B. Install base on solid backing. Bond tightly to wall and floor surfaces.

6. CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.

7. PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Surface preparation.
 - B. Field application of paints, stains, and varnishes.
 - C. Materials for backpriming woodwork.
 - D. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
 1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
 2. Mechanical and Electrical:
 - a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
 - b. In finished areas, paint shop-primed items.
 - E. Do Not Paint or Finish the Following Items:
 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 2. Items indicated to receive other finishes.
 3. Items indicated to remain unfinished.
 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, and lead items.
 6. Marble, granite, slate, and other natural stones.
 7. Floors, unless specifically indicated.
 8. Ceramic and other tiles.
 9. Brick, architectural concrete, cast stone, integrally colored plaster and stucco.
 10. Glass.
 11. Concrete masonry units in utility, mechanical, and electrical spaces.
 12. Acoustical materials, unless specifically indicated.
 13. Concealed pipes, ducts, and conduits.
2. DEFINITIONS
 - A. Conform to ASTM D16 for interpretation of terms used in this section.
3. REFERENCE STANDARDS
 - A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.
 - B. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2005 (Reapproved 2012).
 - C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.
 - D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition, www.paintinfo.com.
 - E. SSPC-SP 13 - Surface Preparation of Concrete; (Reaffirmed 2015).; 2003.
4. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide complete list of 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. MPI product number (e.g. MPI #47).
 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
 4. Full and complete color charts for all paint systems specified.
5. **QUALITY ASSURANCE**
- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum ten years documented experience.
 - B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years documented experience and approved by manufacturer.
6. **DELIVERY, STORAGE, AND HANDLING**
- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
 - B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
 - C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.
7. **FIELD CONDITIONS**
- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
 - B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
 - C. Do not apply materials when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F (3 degrees C) above the dew point; or to damp or wet surfaces.
 - D. Minimum Application Temperatures for Paints: 50 degrees F (10 degrees C) for interiors unless required otherwise by manufacturer's instructions.
 - E. Minimum Application Temperature for Varnish Finishes: 65 degrees F (18 degrees C) for interior, unless required otherwise by manufacturer's instructions.
 - F. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

1. **MANUFACTURERS**
- A. Provide paints and finishes from the same manufacturer unless otherwise noted below.
 1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
 2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.
 3. Substitution of a different paint system using MPI-approved products by the same manufacturer will be considered.
 4. Substitutions shall be reviewed and approved by UMMC Office of Planning, Design & Construction.
 - B. **Paints:**
 1. Base Manufacturer: Benjamin Moore & Co..
 2. PPG Paints: www.ppgpaints.com/#sle.
 3. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
 - C. **Transparent Finishes:**
 1. Base Manufacturer: Benjamin Moore & Co..

2. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
 3. Benjamin Moore & Co: www.benjaminmoore.com..
 4. Other Equal Products.
- D. Stains:
1. Base Manufacturer: Sherwin-Williams Company.
 2. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
 3. Other equal products.
- E. Primer Sealers: Same manufacturer as top coats.
2. PAINTS AND FINISHES - GENERAL
- A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
3. PAINT SYSTEMS - INTERIOR
- A. Paint WI-OP-3A - Wood, Opaque, Alkyd, 3 Coat:
1. One coat alkyd primer sealer; Benjamin Moore Super Spec Alkyd Enamel Undercoater Primer Sealer (C245); MPI #46.
 2. Semi-gloss: Two coats of alkyd enamel; Benjamin Moore Super Spc Alkyd Semi Gloss Enamel (C271); MPI #51.
- B. Paint MI-OP-3A - Ferrous Metals, Unprimed, Alkyd, 3 Coat:
1. One coat of alkyd primer; Benjamin Moore Alky Metal Primer (P06); MPI #79.
 2. Semi-gloss: Two coats of alkyd enamel; Benjamin Moore Super Spec Alkyd Semi-Gloss Enamel (C271); MPI #51.
- C. Paint Mgl-OP-3A - Galvanized Metals, Alkyd, 3 Coat:
1. One coat galvanize primer; Benjamin Moore Acrylic Metal Primer (P04); MPI #107, #134.
 2. Semi-gloss: Two coats of alkyd enamel; Benjamin Moore Super Spec Alkyd Semi-Gloss Enamel (C271); MPI #51.
- D. Paint GI-OP-3LA - Gypsum Board/Plaster, Latex-Acrylic, 3 Coat: See also Appendix A - UMMC Finish Standards. Note! sheen may vary based on location.
1. One coat of latex-acrylic primer sealer; Benjamin Moore Ultra Spec Primer Sealer (N534); MPI #50, #50x, #149, #149x.
 2. Semi-gloss (@ Wet Areas): Two coats of latex-acrylic enamel; Benjamin Moore Ulta Spec Acrylic Semi-Gloss Enamel (N539); MPI #43.
 3. Eggshell (@ Vertical Surfaces): Two coats of latex-acrylic enamel; Benjamin Moore Ulta Spec Acrylic Eggshell Enamel (N538); MPI #52, #52x, #145, #145x, #139, #139x.
 4. Flat (@ Ceilings): Two coats of latex enamel-acrylic; Benjamin Moore Ultra Spec Acrylic Flat Enamel (N536); MPI #53, #53x, 143, #143x.
4. ACCESSORY MATERIALS
- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

1. EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.
- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Gypsum Wallboard: 12 percent.
 - 2. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
 - 3. Concrete Floors and Traffic Surfaces: 8 percent.

2. PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or repair existing paints or finishes that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- G. Concrete:
 - 1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
 - 2. Clean surfaces with pressurized water. Use pressure range of 1500 to 4000 psi (10,350 to 27,580 kPa) at 6 to 12 inches (150 to 300 mm). Allow to dry.
 - 3. Clean concrete according to ASTM D4258. Allow to dry.
 - 4. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.
- H. Masonry:
 - 1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
 - 2. Prepare surface as recommended by top coat manufacturer.
 - 3. Clean surfaces with pressurized water. Use pressure range of 600 to 1500 psi (4140 to 10,350 kPa) at 6 to 12 inches (150 to 300 mm). Allow to dry.
- I. Concrete Floors and Traffic Surfaces: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
- J. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- K. Wood Surfaces 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.
- L. Wood Surfaces to Receive Transparent Finish: 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.

M. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3. APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- F. Sand wood and metal surfaces lightly between coats to achieve required finish.
- G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- H. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

4. CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

5. PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

6. SCHEDULE - PAINT SYSTEMS

- A. See Appendix A - UMMC Finish Standards.

END OF SECTION

Dimensional Letter Signage

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Dimensional letter signage.
2. PRICE AND PAYMENT PROCEDURES
 - A. Allowances:
 1. See Section 01.2100 - Allowances for cash allowances affecting this section.
 2. Include cash allowance for purchase and delivery but not installation.
3. 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; 2009.
4. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements for submittal procedures.
 - B. Product Data: Manufacturer's product literature for each type of dimensional letter sign, indicating style, font, colors, locations, and overall dimensions of each sign.
 - C. Shop Drawings:
 1. Include dimensions, locations, elevations, materials, text and graphic layout, and attachment details.
 - D. Samples: Submit one sample of each type of dimensional letter sign of size similar to that required for project, indicating sign style, font, and method of attachment.
 - E. Manufacturer's Installation Instructions: Include installation templates and attachment devices.
5. QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
6. DELIVERY, STORAGE, AND HANDLING
 - A. Package dimensional letter signs as required to prevent damage before installation.
 - B. Store under cover and elevated above grade.
 - C. Store tape adhesive at a normal room temperature of 68 to 72 degrees F (20 to 22 degrees C).
7. FIELD CONDITIONS
 - A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
 - B. Maintain minimum ambient temperature during and after installation.

PART 2 PRODUCTS

1. MANUFACTURERS
 - A. Dimensional Letter Signs:
 1. CityScapes Inc; _____: www.cityscapesinc.com/#sle.
 2. FASTSIGNS International, Inc; _____: www.fastsigns.com/#sle.
 3. Inpro Corporation; _____: www.inprocorp.com/#sle.
 4. Takeform; _____: www.takeform.net/#sle.
 5. Substitutions: See Section 01.6000 - Product Requirements.
2. REGULATORY REQUIREMENTS
 - A. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.

3. DIMENSIONAL LETTERS

- A. Applications: Building identification.
 - 1. Use individual metal letters.
 - 2. Mounting Location: Exterior as indicated on drawings.
- B. Metal Letters:
 - 1. Material: Stainless steel sheet, fabricated reverse channel.
 - 2. Thickness: 1/8 inch minimum (3 mm).
 - 3. Letter Height: _____ inches (_____ mm).
 - 4. Text and Typeface:
 - a. Character Font: Helvetica, Arial, or other sans serif font.
 - 5. Finish: Brushed, satin.
 - 6. Color: As selected.
 - 7. Mounting: Concealed screws.

4. ACCESSORIES

- A. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.
- B. Exposed Screws: Stainless steel.
- C. Tape Adhesive: Double-sided tape, permanent adhesive.

PART 3 EXECUTION

1. EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

2. INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install with horizontal edges level.
- C. Locate dimensional letter signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- D. Protect from damage until mm-dd-yyyy; repair or replace damaged items.

END OF SECTION

Wall and Corner Guards

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Corner guards.
2. REFERENCE STANDARDS
 - A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
3. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Indicate physical dimensions, features, anchorage details, and rough-in measurements.
 - C. Samples: Submit two sections of bumper rail, 24 inch (600 mm) long, illustrating component design, configuration, color and finish.
 - D. Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention, and _____.

PART 2 PRODUCTS

1. MANUFACTURERS
 - A. Wall and Corner Guards:
 1. See Appendix A - UMMC Finish Standards for manufacturer.
2. FABRICATION
 - A. Fabricate components with tight joints, corners and seams.
 - B. Pre-drill holes for attachment.
 - C. Form end trim closure by capping and finishing smooth.

PART 3 EXECUTION

1. EXAMINATION
 - A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
 - B. Verify that field measurements are as indicated on drawings.
2. INSTALLATION
 - A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members only.
3. TOLERANCES
 - A. Maximum Variation From Required Height: 1/4 inch (6 mm).
 - B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch (6 mm).

END OF SECTION

Toilet, Bath, and Utility Accessories

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Commercial toilet accessories.
 - B. Under-lavatory pipe supply covers.
 - C. Utility room accessories.
2. RELATED REQUIREMENTS
 - A. Section 09.3000 - Tiling: Ceramic washroom accessories.
3. REFERENCE STANDARDS
 - A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
 - B. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures; 2011.
 - C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
 - D. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2015.
 - E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
 - F. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
 - G. ASTM B86 - Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings; 2013.
 - H. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2011.
 - I. ASTM C1036 - Standard Specification for Flat Glass; 2011.
 - J. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.
 - K. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2008 (Reapproved 2013).
 - L. ASTM C1822 - Standard Specification for Insulating Covers on Accessible Lavatory Piping; 2015.
 - M. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
 - N. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015.
 - O. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.
4. ADMINISTRATIVE REQUIREMENTS
 - A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.
5. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
 - C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

1. MANUFACTURERS
 - A. Commercial Toilet, Shower, and Bath Accessories:
 1. American Specialties, Inc; _____: www.americanspecialties.com/#sle.
 2. Bradley Corporation; _____: www.bradleycorp.com/#sle.

3. Georgia-Pacific Professional; _____: www.blue-connect.com/#sle.
 4. Substitutions: Section 01.6000 - Product Requirements.
- B. Under-Lavatory Pipe Supply Covers:
1. Plumberex Specialty Products, Inc; _____: www.plumberex.com/#sle.
 2. Substitutions: Section 01.6000 - Product Requirements.
- C. Provide products of each category type by single manufacturer.
2. MATERIALS
- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 1. Grind welded joints smooth.
 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
 - B. Keys: Provide two keys for each accessory to Owner; master key lockable accessories.
 - C. Stainless Steel Sheet: ASTM A666, Type 304.
 - D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
 - E. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
 - F. Zinc Alloy: Die cast, ASTM B86.
 - G. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
 - H. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.
 - I. Adhesive: Two component epoxy type, waterproof.
 - J. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
 - K. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.
3. FINISHES
- A. Stainless Steel: Satin finish, unless otherwise noted.
 - B. Chrome/Nickel Plating: ASTM B456, SC 2, polished finish, unless otherwise noted.
 - C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.
 - D. Powder Coated Steel: Clean, degrease, and neutralize. Follow immediately with a phosphatizing treatment, prime coat and two finish coats powder coat enamel.
 - E. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.
 - F. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.
 - G. Back paint components where contact is made with building finishes to prevent electrolysis.
4. COMMERCIAL TOILET ACCESSORIES
- A. Toilet Paper Dispenser: Single roll, surface mounted bracket type, stainless steel, spindleless type for tension spring delivery designed to prevent theft of tissue roll.
 - B. Combination Towel Dispenser/Waste Receptacle: Recessed flush with wall, stainless steel; seamless wall flanges, continuous piano hinges, _____.
 1. Waste receptacle liner: Reusable, heavy-duty vinyl.
 2. Towel dispenser capacity: 400 C-fold.
 3. Waste receptacle capacity: 4 gallons (15 liters).
 - C. Automated Soap Dispenser: Liquid soap dispenser, wall-mounted, with stainless steel cover and window to gauge soap level, tumbler lock.
 1. Minimum Capacity: 48 ounces (1.5 liters).

- D. Mirrors: Stainless steel framed, 1/4 inch (6 mm) thick annealed float glass; ASTM C1036.
 - 1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
 - 2. Size: _____.
 - 3. Frame: 0.05 inch (1.3 mm) angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; satin finish.
 - 4. Backing: Full-mirror sized, minimum 0.03 inch (0.8 mm) galvanized steel sheet and nonabsorptive filler material.
 - 5. Fixed Tilt Mirrors: Minimum 3 inches (75 mm) tilt from top to bottom.
 - E. Grab Bars: Stainless steel, smooth surface.
 - 1. Standard Duty Grab Bars:
 - a. Push/Pull Point Load: 250 pound-force (1112 N), minimum.
 - b. Dimensions: 1-1/4 inch (32 mm) outside diameter, minimum 0.05 inch (1.3 mm) wall thickness, exposed flange mounting, 1-1/2 inch (38 mm) clearance between wall and inside of grab bar.
 - c. Finish: Satin.
 - d. Length and Configuration: As indicated on drawings.
5. UNDER-LAVATORY PIPE AND SUPPLY COVERS
- A. Under-Lavatory Pipe and Supply Covers:
 - 1. Insulate exposed drainage piping including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.
 - 2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
 - 3. Construction: 1/8 inch (3.2 mm) flexible PVC.
 - a. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 - b. Comply with ASTM C1822, type indicated.
 - c. Comply with ASME A112.18.9.
 - d. Comply with ICC A117.1.
 - e. Microbial and Fungal Resistance: Comply with ASTM G21.
 - 4. Color: White.
6. UTILITY ROOM ACCESSORIES
- A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch (1.3 mm) thick stainless steel, Type 304, with 1/2 inch (12 mm) returned edges, 0.06 inch (1.6 mm) steel wall brackets.
 - 1. Drying rod: Stainless steel, 1/4 inch (6 mm) diameter.
 - 2. Hooks: Two, 0.06 inch (1.6 mm) stainless steel rag hooks at shelf front.
 - 3. Mop/broom holders: Three spring-loaded rubber cam holders at shelf front.
 - 4. Length: Manufacturer's standard length for number of holders/hooks.

PART 3 EXECUTION

- 1. EXAMINATION
 - A. Verify existing conditions before starting work.
 - B. Verify exact location of accessories for installation.
 - C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.
 - D. Verify that field measurements are as indicated on drawings.

2. PREPARATION
 - A. Deliver inserts and rough-in frames to site for timely installation.
 - B. Provide templates and rough-in measurements as required.
3. INSTALLATION
 - A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
 - B. Install plumb and level, securely and rigidly anchored to substrate.
 - C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated. Refer to Drawings.
4. PROTECTION
 - A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

Fire Protection Specialties

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Fire extinguishers.
 - B. Fire extinguisher cabinets.
 - C. Accessories.
2. REFERENCE STANDARDS
 - A. FM (AG) - FM Approval Guide; current edition.
 - B. NFPA 10 - Standard for Portable Fire Extinguishers; 2013.
 - C. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
3. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide extinguisher operational features.
 - C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.
 - D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

PART 2 PRODUCTS

1. MANUFACTURERS
 - A. Fire Extinguishers:
 1. Amerex Corporation: www.amerex-fire.com
 2. Substitutions: See Section 01.6000 - Product Requirements.
 - B. Fire Extinguisher Cabinets and Accessories:
 1. Activar Construction Products Group; _____: www.activarcpg.com/#sle.
 2. Larsen's Manufacturing Co; _____: www.larsensmfg.com/#sle.
 3. Substitutions: See Section 01.6000 - Product Requirements.
2. 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 gage.
 1. Amerex B441 type
 2. Class: A:B:C type.
 3. Size: 10 pound (4.54 kg).
 4. Temperature range: Minus 40 degrees F (Minus 40 degrees C) to ___ degrees F (___ degrees C).
3. FIRE EXTINGUISHER CABINETS
 - A. Fire Rated Cabinet Construction: One-hour fire rated.
 - B. Cabinet Configuration: Semi-recessed type.
 - C. Door: 0.036 inch (0.9 mm) metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinge. Handle shall be recessed.
 - D. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.
 - E. Finish of Cabinet Interior: White colored enamel.
4. ACCESSORIES
 - A. Extinguisher Brackets: Formed steel, chrome-plated.

PART 3 EXECUTION

1. EXAMINATION
 - A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

2. INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Secure rigidly in place.

C. Place extinguishers in cabinets.

END OF SECTION

Residential Appliances

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Kitchen appliances.
2. RELATED REQUIREMENTS
 - A. Section 26.0583 - Wiring Connections: Electrical connections for appliances.
3. REFERENCE STANDARDS
 - A. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
4. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.
 - C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
5. QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
 - B. Electric Appliances: Listed and labeled by UL (DIR) and complying with NEMA Standards (National Electrical Manufacturers Association).
 - C. Gas Appliances: Bearing design certification seal of American Gas Association (AGA).

PART 2 PRODUCTS

1. KITCHEN APPLIANCES
 - A. Provide Equipment Eligible for Energy Star Rating: Energy Star Rated.
 - B. Range, Type ____: Electric, free-standing, with glass-ceramic cooktop.
 1. Size: 30 inches (762 mm) wide.
 2. Oven: Self-cleaning with electronic ignition.
 3. Elements: Four (4).
 4. Controls: Solid state electronic.
 5. Features: Include automatic meat thermometer, storage drawer, oven door window, broiler pan and grid, oven light, and ____.
 6. Exterior Finish: Porcelain enameled steel, color as indicated.
 7. Manufacturers:
 - a. GE Appliances; GE Profile 30" Smart Slide-In Front Control Induction and Convection Range; Model #PHS930BLTS: www.geappliances.com/#sle.
 - b. Substitutions: See Section 01.6000 - Product Requirements.

PART 3 EXECUTION

1. EXAMINATION
 - A. Verify utility rough-ins are provided and correctly located.
2. INSTALLATION
 - A. Install in accordance with manufacturer's instructions.
 - B. Anchor built-in equipment in place.
3. ADJUSTING
 - A. Adjust equipment to provide efficient operation.
4. CLEANING
 - A. Remove packing materials from equipment and properly discard.

B. Wash and clean equipment.

Foodservice Equipment

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Foodservice equipment.
 - B. Connections to utilities.
2. REFERENCE STANDARDS
3. ADMINISTRATIVE REQUIREMENTS
 - A. Preinstallation Meeting: Convene one week before starting work of this section.
4. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide data on appliances; indicate configuration, sizes, materials, finishes, locations, and utility service connection locations, service characteristics, and wiring diagrams.
 - C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and _____.
 - D. Certificates: Certify that products of this section meet or exceed specified requirements.
 - E. Operation Data: Provide operating data for the specified equipment and _____.
 - F. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules and _____.
 - G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
5. QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in manufacture of standard products of the type specified.
6. DELIVERY, STORAGE, AND HANDLING
 - A. Store products clear of floor in a manner to prevent damage.
 - B. Coordinate size of access and route to place of installation.
7. WARRANTY
 - A. See Section 01.7800 - Closeout Submittals, for additional warranty requirements.
 - B. Correct defective work of this section within a five year period after Date of Substantial Completion.
 - C. Provide five year manufacturer warranty for replacement or repair of scheduled equipment, refrigerant and compressors, including disconnection and removal of defective unit, and connection of replacement unit.

PART 2 PRODUCTS

1. EQUIPMENT
 - A. Equipment Schedule: Refer to schedule in Construction Drawings.
 - B. Installation Accessories: Provide rough-in hardware, supports and connections, attachment devices, closure trim, and accessories as required for complete installation.

END OF SECTION

Window Shades

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Interior manual roller shades.
2. RELATED REQUIREMENTS
 - A. Section 06.1000 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.
3. REFERENCE STANDARDS
 - A. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015.
 - B. C2C (DIR) - C2C Certified Products Registry; Cradle to Cradle Products Innovation Institute; <http://www.c2ccertified.org/products/registry>.
 - C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
 - D. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2015.
 - E. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.
 - F. WCMA A100.1 - Safety of Corded Window Covering Products; Current Edition, Including All Revisions.
4. ADMINISTRATIVE REQUIREMENTS
 - A. Coordination:
 - B. Sequencing:
 1. Do not fabricate shades until field dimensions for each opening have been taken with field conditions in place.
 2. Do not install shades until final surface finishes and painting are complete.
5. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
 - C. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.
6. QUALITY ASSURANCE
 - A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
7. DELIVERY, STORAGE, AND HANDLING
 - A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.
 - B. Handle and store shades in accordance with manufacturer's recommendations.
8. FIELD CONDITIONS
 - A. Do not install products under environmental conditions outside manufacturer's absolute limits.
9. WARRANTY
 - A. See Section 01.7800 - Closeout Submittals, for additional warranty requirements.
 - B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
 1. Shade Hardware: One year.
 2. Fabric: One year.
 3. Aluminum and Steel Coatings: One year.

PART 2 PRODUCTS

1. MANUFACTURERS

A. Interior Manually Operated Roller Shades:

1. Draper, Inc; Clutch Operated FlexShade: www.draperinc.com/#sle.
2. Hunter Douglas Architectural; RB500 Manual Roller Shades: www.hunterdouglasarchitectural.com/#sle.
3. Lutron Electronics Co., Inc; Contract Roller Manual Roller Shades: www.lutron.com/#sle.
4. Substitutions: See Section 01.6000 - Product Requirements.

2. ROLLER SHADES

A. General:

1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
2. Provide shade system that operates smoothly when shades are raised or lowered.

B. Interior Roller Shades - Basis of Design: Draper, Inc; Clutch Operated FlexShade: www.draperinc.com/#sle.

1. Description: Single roller, manually operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and other components necessary for complete installation.
 - a. Mounting: Wall mounted.
 - b. Size: As indicated on drawings.
2. Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
 - a. Hardware Type: Universal brackets.
3. Roller Tubes: As required for type of shade operation; designed for removal without removing mounting hardware.
 - a. Material: Extruded aluminum or steel, with wall thickness and material selected by manufacturer.
 - b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
4. Hembars: Designed to maintain bottom of shade straight and flat, selected from manufacturer's standard options.
5. Manual Operation:
 - a. Clutch Operator: Manufacturer's standard material and design, permanently lubricated.
 - b. Drive Chain: Continuous loop, stainless steel, beaded ball chain, 95 lb (43 kg) minimum breaking strength; comply with WCMA A100.1. Provide upper and lower limit stops.
 - c. Shade Lift Assistance: Manufacturer's standard spring device contained in the idler end of roller tube to reduce force required to lift shades; as required based on shade weight.
 - d. Chain Retainer:
 - 1) Chain tensioning device complying with WCMA A100.1.
 - 2) Manufacturer's standard clip.
6. Accessories:
 - a. Fascia: Extruded aluminum, size as required to conceal shade mounting, attachable to mounting end caps, without exposed fasteners; clear anodized finish.
 - 1) Color: Black.

- b. Exposed Headbox: Extruded aluminum, size as required to conceal shade mounting; clear anodized finish.
 - 1) Color: Black.
 - c. End Cap Covers: Match fascia or headbox finish.
 - d. Fasteners: Noncorrosive, and as recommended by shade manufacturer.
- 3. SHADE FABRIC
 - A. Fabric - Type ____: Nonflammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
 - 1. Material: Vinyl coated polyester.
 - 2. Performance Requirements:
 - a. Flammability: Pass NFPA 701 large and small tests.
 - b. Fungal Resistance: No growth when tested according to ASTM G21.
 - 3. Openness Factor: 0.5%.
 - 4. Weight: 14.6 ____ ounces per square yard (____ grams per square meter).
 - 5. Roll Width: As indicated on drawings ____ inches (____ mm).
 - 6. Color: As selected by Architect from manufacturer's full range of colors.
 - 7. Fabrication:
 - a. Fabric Orientation: Railroaded, fabric is turned 90 degrees off the roll.
 - b. Battens: Full width of shade, enclose in welded shade fabric pocket.
- 4. ROLLER SHADE FABRICATION
 - A. Field measure finished openings prior to ordering or fabrication.
 - B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
 - 1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch (13 mm) space between bottom bar and window stool.
 - 2. Horizontal Dimensions - Inside Mounting: Fill openings from jamb to jamb.
 - 3. Horizontal Dimensions - Outside Mounting: Extend shades 2 inches (50 mm) beyond jambs on each side.
 - C. Dimensional Tolerances: As recommended in writing by manufacturer.
 - D. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

PART 3 EXECUTION

- 1. EXAMINATION
 - A. Examine finished openings for deficiencies that may preclude satisfactory installation.
 - B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
 - C. Start of installation shall be considered acceptance of substrates.
- 2. PREPARATION
 - A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
 - B. Coordinate with window installation and placement of concealed blocking to support shades.
- 3. INSTALLATION
 - A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
 - B. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

4. CLEANING
 - A. Clean soiled shades and exposed components as recommended by manufacturer.
 - B. Replace shades that cannot be cleaned to "like new" condition.
5. CLOSEOUT ACTIVITIES
 - A. See Section 01.7800 - Closeout Submittals, for closeout submittals.
 - B. See Section 01.7900 - Demonstration and Training, for additional requirements.
 - C. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.
6. PROTECTION
 - A. Protect installed products from subsequent construction operations.
 - B. Touch-up, repair, or replace damaged products before Substantial Completion.

END OF SECTION

PART 1 GENERAL

1. SECTION INCLUDES
 - A. Countertops for architectural cabinet work.
 - B. Countertops for manufactured casework.
 - C. Wall-hung counters and vanity tops.
2. RELATED REQUIREMENTS
 - A. Section 06.4100 - Architectural Wood Casework.
 - B. Section 22.4000 - Plumbing Fixtures: Sinks.
3. REFERENCE STANDARDS
 - A. ANSI A208.1 - American National Standard for Particleboard; 2009.
 - B. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2009.
 - C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
 - D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
 - E. AWI (QCP) - Quality Certification Program; current edition at www.awiqcp.org.
 - F. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
 - G. AWMAC (GIS) - Guarantee and Inspection Services Program; current edition at www.awmac.com/gis.php.
 - H. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.
 - I. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.
 - J. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.
 - K. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
 - L. PS 1 - Structural Plywood; 2009.
 - M. WI (CCP) - Certified Compliance Program (CCP); current edition at www.woodworkinstitute.com/certification.
4. SUBMITTALS
 - A. See Section 01.3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Specimen warranty.
 - C. Shop Drawings: Complete details of materials and installation ; combine with shop drawings of cabinets and casework specified in other sections.
 - D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
 - E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
 - F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
 - G. Installation Instructions: Manufacturer's installation instructions and recommendations.
 - H. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.
5. QUALITY ASSURANCE
 - A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.
 - B. Quality Certification:

1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.
 2. Comply with WI (CCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.woodworkinstitute.com/#sle.
 3. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
 4. Provide designated labels on shop drawings as required by certification program.
 5. Provide designated labels on installed products as required by certification program.
 6. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
6. DELIVERY, STORAGE, AND HANDLING
- A. Store products in manufacturer's unopened packaging until ready for installation.
 - B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
7. FIELD CONDITIONS
- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

1. COUNTERTOPS
- A. Quality Standard: See Section 12.3100.
 - B. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
 1. Flat Sheet Thickness: 1/4 inch (6 mm), minimum.
 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Manufacturers:
 - 1) Wilsonart; _____: www.wilsonart.com/#sle.
 - b. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
 - c. Color and Pattern: As indicated on Drawings
 3. Other Components Thickness: 1/2 inch (12 mm), minimum.
 4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch (32 mm) thick; square edge; use marine edge at sinks.
 5. Skirts: As indicated on drawings.
2. MATERIALS
- A. Wood-Based Components:
 1. Wood fabricated from old growth timber is not permitted.
 - B. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.
 - C. Particleboard for Supporting Substrate: ANSI A208.1 Grade 2-M-2, 45 pcf (20 kg/cu m) minimum density; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.
 - D. Medium Density Fiberboard for Supporting Substrate: ANSI A208.2.
 - E. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

- F. Cove Molding for Top of Splashes: Rubber with semi-gloss finish and T-spline to fit between splash and wall; 1/2 inch (12 mm) by 1/2 inch (12 mm).
 - G. Joint Sealant: Mildew-resistant silicone sealant, white.
3. FABRICATION
- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 1. Join lengths of tops using best method recommended by manufacturer.
 - 2. Fabricate to overhang fronts and ends of cabinets 1 inch (25 mm) except where top butts against cabinet or wall.
 - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
 - B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2. Height: 4 inches (102 mm), unless otherwise indicated.
 - C. Solid Surfacing: Fabricate tops up to 144 inches (3657 mm) long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

PART 3 EXECUTION

1. EXAMINATION
- A. Do not begin installation until substrates have been properly prepared.
 - B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
 - C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.
2. PREPARATION
- A. Clean surfaces thoroughly prior to installation.
 - B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
3. INSTALLATION
- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
 - B. Seal joint between back/end splashes and vertical surfaces.
 - 1. Where indicated use rubber cove molding.
 - 2. Where applied cove molding is not indicated use specified sealant.
4. TOLERANCES
- A. Variation From Horizontal: 1/8 inch in 10 feet (3 mm in 3 m), maximum.
 - B. Offset From Wall, Countertops: 1/8 inch (3 mm) maximum; 1/16 inch (1.5 mm) minimum.
 - C. Field Joints: 1/8 inch (3 mm) wide, maximum.
5. CLEANING
- A. Clean countertop surfaces thoroughly.
6. PROTECTION
- A. Protect installed products until completion of project.
 - B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

Common Work Results for Fire Suppression**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Above ground piping.
- B. Escutcheons.
- C. Pipe sleeves.

1.02 SUBMITTALS

- A. Product Data: Provide manufacturer's catalog information. Indicate valve data and ratings.

PART 2 PRODUCTS**2.01 GENERAL REQUIREMENTS**

- A. Welding Materials and Procedures: Comply with ASME BPVC-IX.
- B. Provide system pipes, fittings, sleeves, escutcheons, seals, and other related accessories.

2.02 ABOVE GROUND PIPING

- A. Steel Pipe: ASTM A795 Schedule 40, black.
 - 1. Steel Fittings: ASME B16.5 steel flanges and fittings.
 - 2. Cast Iron Fittings: ASME B16.1, flanges and flanged fittings and ASME B16.4, threaded fittings.
 - 3. Malleable Iron Fittings: ASME B16.3, threaded fittings and ASTM A47/A47M.

2.03 PIPE SLEEVES

- A. Plastic, Sheet Metal, or Moisture-Resistant Fiber: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.
- B. Pipe Passing Through Mechanical, Laundry, and Animal Room Floors above Basement:
 - 1. Galvanized steel pipe or black iron pipe with asphalt coating.
 - 2. Connect sleeve with floor plate except in mechanical rooms.

2.04 ESCUTCHEONS

- A. Material:
 - 1. Fabricate from nonferrous metal.
 - 2. Chrome-plated.
 - 3. Metals and Finish: Comply with ASME A112.18.1.
- B. Construction:
 - 1. One-piece for mounting on chrome-plated tubing or pipe and one-piece or split-pattern type elsewhere.
 - 2. Internal spring tension devices or setscrews to maintain a fixed position against a surface.

PART 3 EXECUTION**3.01 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

- A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13.
- B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- C. Install piping to conserve building space, to not interfere with use of space and other work.

- D. Group piping whenever practical at common elevations.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Pipe Hangers and Supports:
 - 1. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 - 2. Place hangers within 12 inches of each horizontal elbow.
 - 3. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 - 4. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
 - 5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- G. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- H. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc-rich primer to welding.
- I. Provide sleeves when penetrating footings, floors, walls, and partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.
- J. Escutcheons:
 - 1. Install and firmly attach escutcheons at piping penetrations into finished spaces.
 - 2. Provide escutcheons on both sides of partitions separating finished areas through which piping passes.
 - 3. Use chrome plated escutcheons in occupied spaces and to conceal openings in construction.
- K. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, unions, and couplings for servicing are consistently provided.

END OF SECTION

Identification for Fire Suppression Piping and Equipment**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Nameplates.
- B. Tags.
- C. Pipe markers.
- D. Ceiling tacks.

1.02 REFERENCE STANDARDS

- A. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2017.

1.03 SUBMITTALS

- A. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.
- B. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
- C. Manufacturer's Installation Instructions: Indicate special procedures, and installation instructions.

PART 2 PRODUCTS**2.01 NAMEPLATES**

- A. Description: Laminated three-layer plastic with engraved letters.
 - 1. Letter Color: White.
 - 2. Letter Height: 1/4 inch.
 - 3. Background Color: Black.
 - 4. Thickness: 1/8 inch.
 - 5. Plastic: Comply with ASTM D709.

2.02 TAGS

- A. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

2.03 PIPE MARKERS

- A. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.

2.04 CEILING TACKS

- A. Description: Steel with 3/4 inch diameter color coded head.

PART 3 EXECUTION**3.01 PREPARATION**

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

- A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install tags with corrosion resistant chain.
- C. Install plastic pipe markers in accordance with manufacturer's instructions.
- D. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.

END OF SECTION

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Fire-Suppression Sprinkler Systems**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Wet-pipe sprinkler system.
- B. System design, installation, and certification.

1.02 REFERENCE STANDARDS

- A. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

- A. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
- B. 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 Sprinklers: Type and size matching those installed in quantity required by referenced NFPA design and installation standard.
 - 3. Sprinkler Wrenches: For each sprinkler type.

PART 2 PRODUCTS**2.01 SPRINKLER SYSTEM**

- A. Sprinkler System: Provide coverage for renovated area in the Teaching Kitchen. Refer to Fire Protection drawings for area being remodeled.
- B. Occupancy: Ordinary hazard, Group 1; comply with NFPA 13.
- C. Occupancy: Light Hazard; comply with NFPA 13.
- D. Water Supply: Determine volume and pressure from water flow test data.
- E. Existing Fire Protection infrastructure in place. Contractor to review existing system and modify to provide coverage indicated.
- F. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

2.02 SPRINKLERS

- A. Suspended Ceiling Type: Semi-recessed pendant type with matching push on escutcheon plate.
 - 1. Coverage Type: Standard.
 - 2. Finish: Enamel, color White.
 - 3. Escutcheon Plate Finish: White.
 - 4. Fusible Link: Fusible solder link type temperature rated for specific area hazard.

PART 3 EXECUTION**3.01 INSTALLATION**

- A. Install in accordance with referenced NFPA design and installation standard.
- B. Install equipment in accordance with manufacturer's instructions.
- C. Place pipe runs to minimize obstruction to other work.
- D. Place piping in concealed spaces above finished ceilings.
- E. Center sprinklers in two directions in ceiling tile and provide piping offsets as required.
- F. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.

G. Flush entire piping system of foreign matter.

END OF SECTION

Hangers and Supports for Plumbing Piping and Equipment

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Strut systems for pipe or equipment support.
- B. Beam clamps.
- C. Pipe hangers.
- D. Pipe supports, guides, shields, and saddles.
- E. Anchors and fasteners.

1.02 SUBMITTALS

- A. Product Data: Provide manufacturer's standard catalog pages and data sheets for metal channel (strut) framing systems, post-installed concrete and masonry anchors, and thermal insulated pipe supports.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Provide required hardware to hang or support piping, equipment, or fixtures with related accessories as necessary to complete installation of plumbing work.
- B. Provide hardware products listed, classified, and labeled as suitable for intended purpose.
- C. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
- D. Fire Resistance: Provide hardware rated for 60 minutes resistance unless specifically indicated by the authority having jurisdiction.
- E. Materials for Metal Fabricated Supports:
 - 1. Zinc-Plated Steel: Electroplated in accordance with ASTM B633 unless stated otherwise.
 - 2. Galvanized Steel: Hot-dip galvanized in accordance with ASTM A123/A123M or ASTM A153/A153M unless stated otherwise.
- F. Corrosion Resistance: Use corrosion-resistant metal-based materials fully compatible with exposed piping materials and suitable for the environment where installed.
 - 1. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
 - 2. Outdoor, Damp, or Wet-Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.

2.02 STRUT SYSTEMS FOR PIPE OR EQUIPMENT SUPPORT

- A. Strut Channels:
 - 1. ASTM A653/A653M galvanized steel bracket with clamps for surface mounting of piping or plumbing equipment support.
 - 2. Channel or Bracket Kits: Include rods, brackets, end-fixed fittings, covers, clips, and other related hardware required to complete sectional trapeze section for piping or other support.
- B. Hanger Rods:
 - 1. Threaded zinc-plated steel unless otherwise indicated.
- C. Channel Nuts:
 - 1. Provide carbon steel channel nut with epoxy copper or zinc finish and long, regular, or short spring as indicated on drawings.

2.03 BEAM CLAMPS

- A. C-Clamp: MSS SP-58 type 23, malleable iron and steel with plain, stainless steel, and zinc finish.
- B. Wide Mouth Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish.
- C. Centerload Beam Clamp with Extension Piece: MSS SP-58 type 30, malleable iron with plain finish.
- D. FM (AG) and UL (DIR) Approved Beam Clamp: MSS SP-58 type 19, plain finish.
- E. Provide clamps with hardened steel cup-point set screws and lock-nuts for anchoring in place.
- F. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.

2.04 PIPE HANGERS

- A. Swivel Ring Hangers, Adjustable:
 - 1. MSS SP-58 type 10, epoxy-painted, zinc-colored.
 - 2. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
 - 3. FM (AG) and UL (DIR) listed for specific pipe size runs and loads.
- B. Clevis Hangers, Adjustable:
 - 1. Copper Tube: MSS SP-58 type 1, epoxy-plated copper.
 - 2. Standard-Duty: MSS SP-58 type 1, zinc-colored, epoxy plated.
 - 3. UL (DIR) listed: Pipe sizes 2-1/2 to 8 inch.

2.05 PIPE CLAMPS

- A. Riser Clamps:
 - 1. For insulated pipe runs, provide two bolt-type clamps designed for installation under insulation.
 - 2. MSS SP-58 type 1 or 8, carbon steel or steel with epoxy plated, plain, stainless steel, or zinc plated finish.
 - 3. UL (DIR) listed: Pipe sizes 1/2 to 8 inch.

2.06 PIPE SUPPORTS, GUIDES, SHIELDS, AND SADDLES

- A. Dielectric Barriers: Provide between metallic supports and metallic piping and associated items of dissimilar type; acceptable dielectric barriers include rubber or plastic sheets or coatings attached securely to pipe or item.
- B. Stanchions:
 - 1. Material: Malleable iron, ASTM A47/A47M; or carbon steel, ASTM A36/A36M.
 - 2. Provide coated or plated saddles to isolate steel hangers from dissimilar metal tube or pipe.
 - 3. For pipe runs, use stanchions of same type and material where vertical adjustment is required for stationary pipe.
- C. U-Bolts:
 - 1. MSS SP-58 type 24, carbon steel U-bolt for pipe support or anchoring.
- D. Intermediate Anchors and Pipe Alignment Guides:
 - 1. Pipe Sizes 6 inch and Smaller: Minimum clearance of 0.16 inch.
 - 2. Pipe Sizes 12 to 16 inch: 0.875 inch U-bolt.
 - 3. Use pipe clamps with oversize pipe sleeve that provides clearance around pipe.
- E. Pipe Shields for Insulated Piping:
 - 1. MSS SP-58 type 40, ASTM A1011/A1011M steel or ASTM A653/A653M carbon steel.
 - 2. General Construction and Requirements:
 - a. Surface Burning Characteristics: Comply with ASTM E84 or UL 723.
 - b. Shields Material: UV-resistant polypropylene with glass fill.

- c. Maximum Insulated Pipe Outer Diameter: 12-5/8 inch.
 - d. Service Temperature: Minus 40 to 178 degrees F.
 - e. Pipe shields to be provided at hanger, support, and guide locations on pipe requiring insulation or additional support.
- F. Pipe Supports:
- 1. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
 - 2. Liquid Temperatures Up to 122 degrees F:
 - a. Overhead Support: MSS SP-58 types 1, 3 through 12 clamps.
 - b. Support From Below: MSS SP-58 types 35 through 38.

2.07 ANCHORS AND FASTENERS

- A. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
- B. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
- C. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
- D. Steel: Use beam ceiling clamps, beam clamps, machine bolts, or welded threaded studs.
- E. Beam Ceiling Flanges: ASTM A47/A47M Grade 32510, malleable iron or stainless steel with copper, plain, stainless steel, or zinc finish.
- F. Sheet Metal: Use sheet metal screws.
- G. Post-Installed Concrete and Masonry Anchors: Evaluated and recognized by ICC Evaluation Service, LLC (ICC-ES) for compliance with applicable building code.
- H. Preset Concrete Inserts: Continuous metal strut channel and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
 - 1. Channel Material: Use galvanized steel.
 - 2. Manufacturer: Same as manufacturer of metal strut channel framing system.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.
- C. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.
- D. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- E. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- G. Provide thermal insulated pipe supports complete with hangers and accessories. Install thermal insulated pipe supports during the installation of the piping system.
- H. Equipment Support and Attachment:
 - 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.

2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- I. Preset Concrete Inserts: Use manufacturer-provided closure strips to inhibit concrete seepage during concrete pour.
 - J. Secure fasteners according to manufacturer's recommended torque settings.
 - K. Remove temporary supports.

END OF SECTION

Identification for Plumbing Piping and Equipment**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Tags.
- B. Pipe markers.

1.02 REFERENCE STANDARDS

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.

1.03 SUBMITTALS

- A. Schedules:
 - 1. Submit plumbing component identification schedule listing equipment, piping, and valves.
 - 2. Detail proposed component identification data in terms of wording, symbols, letter size, and color coding to be applied to corresponding product.
 - 3. Valve Data Format: Include id-number, location, function, and model number.

PART 2 PRODUCTS**2.01 PLUMBING COMPONENT IDENTIFICATION GUIDELINE**

- A. Tags:
 - 1. Piping: 3/4 inch diameter and smaller.
- B. Pipe Markers: 3/4 inch diameter and higher.

2.02 TAGS

- A. Metal: Brass, 19 gauge 1-1/2 inch in diameter with smooth edges, blank, smooth edges, and corrosion-resistant ball chain. Up to three lines of text.

2.03 PIPE MARKERS

- A. Flexible Tape Marker: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.

PART 3 EXECUTION**3.01 PREPARATION**

- A. Degrease and clean surfaces to receive identification products.

3.02 INSTALLATION

- A. Install tags in clear view and align with axis of piping
- B. Install plastic pipe markers in accordance with manufacturer's instructions.
- C. Install plastic tape pipe marker around pipe in accordance with manufacturer's instructions.
- D. Apply ASME A13.1 Pipe Marking Rules:
 - 1. Place pipe marker adjacent to changes in direction.
 - 2. Place pipe marker adjacent each valve port and flange end.
 - 3. Place pipe marker at both sides of floor and wall penetrations.
 - 4. Place pipe marker every 25 to 50 feet interval of straight run.
- E. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION

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PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Flexible elastomeric cellular insulation.
- B. Glass fiber insulation.
- C. Jacketing and accessories.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER INSULATION

- A. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
 - 1. K Value: ASTM C177, 0.24 at 75 degrees F.
 - 2. Maximum Service Temperature: 850 degrees F.
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.
- B. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm.
- C. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.
- D. Vapor Barrier Lap Adhesive: Compatible with insulation.
- E. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.

2.03 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

- A. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.
 - 1. Minimum Service Temperature: Minus 40 degrees F.
 - 2. Maximum Service Temperature: 220 degrees F.
 - 3. Connection: Waterproof vapor barrier adhesive.
- B. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.
- C. Weather Barrier: Air dried, contact adhesive, compatible with insulation and ASTM E84 compliant.

2.04 JACKETING AND ACCESSORIES

- A. PVC Plastic Jacket:
 - 1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - a. Minimum Service Temperature: 0 degrees F.
 - b. Maximum Service Temperature: 150 degrees F.
 - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
 - d. Thickness: 10 mil, 0.010 inch.
 - e. Connections: Brush on welding adhesive.
 - 2. Covering Adhesive Mastic: Compatible with insulation.
- B. Canvas Jacket: UL listed 6 oz/sq yd plain weave cotton fabric treated with dilute fire-retardant lagging adhesive.
- C. Aluminum Jacket: (Outdoor Application unless noted otherwise)
 - 1. Comply with ASTM B209/B209M, Temper H14, minimum thickness of 0.016 inch with factory-applied polyethylene and kraft paper moisture barrier on the inside surface.
 - 2. Thickness: 0.016 inch sheet.

3. Finish: Smooth.
4. Joining: Longitudinal slip joints and 2 inch laps.
5. Fittings: 0.016 inch thick die-shaped fitting covers with factory-attached protective liner.
6. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with North American Insulation Manufacturers Association (NAIMA) National Insulation Standards.
- C. Exposed Piping: Locate insulation and cover seams in least visible locations.
- D. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- E. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
- F. Inserts and Shields:
 1. Application: Piping 1-1/2 inches diameter or larger.
 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 3. Insert Location: Between support shield and piping and under the finish jacket.
 4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
 5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
- G. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions.
- H. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with PVC jacket and fitting covers.
- I. Exterior Applications: Provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

3.03 SCHEDULES

- A. Plumbing Systems:
 1. Domestic Cold Water Supply, Hot Water Supply and Hot Water recirculation:
 - a. Glass Fiber Insulation:
 - 1) Pipe Size Range: All inch.
 - 2) Thickness: 1 inch.
 2. Condensate Drain
 - a. Preformed pipe tube flexible elastomeric cellular rubber insulation:
 - 1) All inch.
 - 2) Thickness: 1 inch.
 3. Domestic Hot Water Recirculation Pump
 - a. Flexible elastomeric cellular rubber insulation sheet:
 - 1) All inch.

2) Thickness: 1 inch.

END OF SECTION

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PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sanitary waste piping, above grade.
- B. Domestic water piping, above grade.
- C. Pipe flanges, unions, and couplings.
- D. Pipe hangers and supports.
- E. Pipe sleeve-seal systems.
- F. Ball valves.
- G. Pressure reducing valves.
- H. Strainers.

1.02 SUBMITTALS

- A. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.
- B. Plenum-Installed Acid Waste Piping: Flame-spread index equal or below 25 and smoke-spread index equal or below 50 according to ASTM E84 or UL 723 tests.

2.02 SANITARY WASTE PIPING, ABOVE GRADE AND IN CRAWL SPACE

- A. PVC Pipe: ASTM D2729.
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.
- B. PVC Pipe: ASTM D2665. Drain, Waste and Vent Applications
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.
 - 3. Primer: ASTM F 656

2.03 DOMESTIC WATER PIPING, ABOVE GRADE

- A. Copper Tube: ASTM B88 (ASTM B88M), Type L, Hard Drawn (H).
 - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
 - 2. Joints: ASTM B32, alloy Sn95 solder.
 - 3. Mechanical Press Sealed Fittings: Double-pressed type, NSF 61 and NSF 372 approved or certified, utilizing EPDM, nontoxic, synthetic rubber sealing elements.

2.04 PIPE FLANGES, UNIONS, AND COUPLINGS

- A. Unions for Pipe Sizes 3 inch and Under:
 - 1. Ferrous Pipe: Class 150 malleable iron threaded unions.
 - 2. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.

- B. No-Hub Couplings:
 - 1. Testing: In accordance with ASTM C1277 and CISPI 310.
 - 2. Gasket Material: Neoprene complying with ASTM C564.
 - 3. Band Material: Stainless steel.
 - 4. Eyelet Material: Stainless steel.

2.05 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
 - 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
 - 2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
 - 3. Trapeze Hangers: Welded steel channel frames attached to structure.
 - 4. Vertical Pipe Support: Steel riser clamp.
- B. Plumbing Piping - Drain, Waste, and Vent:
 - 1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
 - 2. Hangers for Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
 - 3. Wall Support for Pipe Sizes to 3 inch: Cast iron hook.
- C. Plumbing Piping - Water:
 - 1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
 - 2. Hangers for Cold Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
 - 3. Hangers for Hot Pipe Sizes 2 to 4 inch: Carbon steel, adjustable, clevis.
- D. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
 - 1. Concrete Wedge Expansion Anchors: Comply with ICC-ES AC193.

2.06 PIPE SLEEVE-SEAL SYSTEMS

- A. Modular Mechanical Seals:
 - 1. Elastomer-based interlocking links continuously fill annular space between pipe and wall-sleeve, wall or casing opening.
 - 2. Watertight seal between pipe and wall-sleeve, wall or casing opening.
 - 3. Size and select seal component materials in accordance to service requirements.
 - 4. Glass reinforced plastic pressure end plates.

2.07 BALL VALVES

- A. Construction, 4 inch and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze body, 304 stainless steel ball, two piece full port, Teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder or threaded ends with union.

2.08 PRESSURE REDUCING VALVES

- A. 2 inch and Smaller:
 - 1. ASSE 1003, bronze body, stainless steel, and thermoplastic internal parts, fabric reinforced diaphragm, strainer, threaded single union ends.
 - 2. Pressure Reducing Pilot-Operator:
 - a. Operating Range: 5 to 50 psi.
 - b. Connected into brass or bronze pilot piping and fittings.
 - c. Fixed flow restrictor, pressure gauges, and isolation valves.

2.09 STRAINERS

- A. Size 1/2 inch to 3 inch:
 - 1. Class 150, threaded forged bronze Y-pattern body, stainless steel perforated mesh screen with cap, and rated for 150 psi, 250 deg F WOG service.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that excavations are to required grade, dry, and not over-excavated.

3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- H. Provide access where valves and fittings are not exposed.
- I. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.
- J. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
- K. Inserts:
 - 1. Provide inserts for placement in concrete formwork.
 - 2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- L. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.9.
 - 2. Support horizontal piping as indicated.
 - 3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 - 4. Place hangers within 12 inches of each horizontal elbow.
 - 5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
- M. Pipe Sleeve-Seal Systems:
 - 1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
 - 2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
 - 3. Locate piping in center of sleeve or penetration.
 - 4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
 - 5. Tighten bolting for a watertight seal.
 - 6. Install in accordance with manufacturer's recommendations.

3.04 FIELD TESTS AND INSPECTIONS

- A. Verify and inspect systems according to requirements by the Authority Having Jurisdiction. In the absence of specific test and inspection procedures proceed as indicated below.
- B. Domestic Water Systems:
 - 1. Perform hydrostatic testing for leakage prior to system disinfection.
 - 2. Test Preparation: Close each fixture valve or disconnect and cap each connected fixture.
 - 3. General:
 - a. Fill the system with water and raise static head to 10 psi above service pressure. Minimum static head of 50 to 150 psi. As an exception, certain codes allow a maximum static pressure of 80 psi.
 - 4. Domestic Water Systems:
 - a. Perform hydrostatic testing for leakage prior to system disinfection.
 - b. Test Preparation: Close each fixture valve or disconnect and cap each connected fixture.
 - c. General:
 - 1) Fill the system with water and raise static head to 10 psi above service pressure. Minimum static head of 50 to 150 psi.
- C. Test Results: Document and certify successful results, otherwise repair, document, and retest.

3.05 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Disinfect water distribution system in accordance with Section 33 0110.58.
- B. Prior to starting work, verify system is complete, flushed, and clean.
- C. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- D. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.
- E. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- F. Maintain disinfectant in system for 24 hours.
- G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- I. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.06 SCHEDULES

- A. Pipe Hanger Spacing:
 - 1. Metal Piping:
 - a. Pipe Size: 1/2 inch to 1-1/4 inch:
 - 1) Maximum Hanger Spacing: 6.5 ft.
 - 2) Hanger Rod Diameter: 3/8 inches.
 - b. Pipe Size: 1-1/2 inch to 2 inch:
 - 1) Maximum Hanger Spacing: 10 ft.
 - 2) Hanger Rod Diameter: 3/8 inch.
 - c. Pipe Size: 2-1/2 inch to 3 inch:
 - 1) Maximum Hanger Spacing: 10 ft.
 - 2) Hanger Rod Diameter: 1/2 inch.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Trap primers.
- B. Mixing valves.
- C. Backflow preventers.
- D. Water hammer arrestors.
- E. Air vents.
- F. Floor drains and floor sinks.
- G. Cleanouts.
- H. Interceptors.
- I. Water hammer arrestors.
- J. Mixing valves.

1.02 SUBMITTALS

- A. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- B. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.02 UTILITY BOXES

- A. Galvanized steel ice maker box. (Guy Gray BIM875QTSAB)
 - 1. G90 hot-dipped galvanized steel (unpainted), 20 gauge ice maker box and faceplate with lead-free, quarter-turn valve with 1/2" MIP/sweat connection furnished. Valve complies with ASME A112.18.1 and NSF 61-G. Refer to schedules on drawings.

2.03 BACKFLOW PREVENTERS

- A. Dual check backflow preventers - sizes 1/2" to 1". (Watts LF7R).
 - 1. Series LF7R Dual Check Valves are designed for non-health hazard residential water system containment and continuous pressure applications, such as the drinking water supply service entrance or individual outlets. Series LF7R uses two compact replaceable check modules and is installed immediately downstream of the residential water meter. The LF7R features Lead Free* construction to comply with Lead Free* installation requirements.
 - 2. The dual check backflow preventer shall meet the domestic requirements of ANSI/ASSE Standard 1024, and bear the seal of approval. It shall be Lead Free* cast copper silicon alloy bodied and include not less than one union. An identification tag indicating direction of flow shall be securely attached to the valve body. The Lead Free* Dual Check Valve shall comply with state codes and standards, where applicable, requiring reduced lead content.

2.04 SANITARY WASTE INTERCEPTORS

- A. Grease interceptor.
 - 1. Zurn Light Commercial Acid Resistant Coated interior and exterior fabricated steel low type grease interceptor, PDI rated as scheduled on drawings. Interceptor to have internal air relief by-pass, bronze cleanout plug and visible double wall trap seal with removable pressure equalizing/flow diffusing inlet baffle, fixed bottom outlet baffle, and visible double

wall trap seal. Gasketed non-skid secured cover with center tie down assembly, complete with external flow control fitting. Regularly furnished with low inlet and outlet.

2.05 MIXING VALVES

- A. Master Mixing Valve with High/Low capacity (LEONARD 186-32A-LF-RF-STSTL-EXP)
 - 1. Single thermostatic water high/low master mixing valve, rough bronze. Includes outlet dial thermometer and shut off valve. Mounted in exposed stainless steel cabinet. Factory piped, assembled, and tested. Minimum flow rate 1 gpm (0.5 gpm with continuously operating recirculation pump)/ maximum flow rate 16 gpm at a 10 psig system pressure drop. Inlet: 3/4" Outlet: 3/4" ASSE 1017 Certified
- B. Point-of-use for manual faucets. (Leonard 170-LF-BP)
 - 1. Lead-free, bronze body with lockable, vandal-resistant temperature adjustment cap. Copper-encapsulated thermostat assembly with polymer thermoplastic shuttle, stainless steel springs and integral check valves on hot and cold inlets. Compression fittings on inlets and outlet. Furnish with cold water by-pass. Certifications: ASSE 1070 and NSF61. Refer to schedule on drawings.

2.06 TRAP PRIMERS

- A. Fixture flush valve type. (Zurn P6000-TPO)
 - 1. Flush valve trap primer shall operate off the flush valve water flow. When flush valve is activated, water to divert to trap primer outlet and supply water to trap by way of connecting copper tubing.
 - 2. The Trap Primer Assembly 1-1/2" flush tube with trap primer collar, spud coupling and flange for top spud connection, 3/8" x 12" supply tube and fittings, vacuum breaker, vacuum breaker tube nut and wall escutcheon.

2.07 FLOOR DRAINS AND FLOOR SINKS

- A. Floor Drain (showers).
 - 1. Cast iron body with latex-based coating, bottom outlet, combination invertible membrane clamp and adjustable collar with seepage slots and polished nickel bronze strainer with raised flange. Refer to schedule on drawings.
- B. Floor Drain (equipment drain receptors).
 - 1. Cast iron body with latex-based coating, bottom outlet, combination invertible membrane clamp and adjustable collar with seepage slots, and polished nickel bronze strainer with raised flange. Refer to schedule on drawings.
- C. Floor Sink (food service areas).
 - 1. Cast iron body and square, medium-duty half-grate with 7/16" slotted openings, white acid-resisting porcelain enamel interior and top, and white ABS anti-splash interior bottom dome strainer. Refer to schedule on drawings.

2.08 CLEANOUTS

- A. Cleanouts at exterior surfaced areas:
- B. Cleanouts at exterior unsurfaced areas:
 - 1. Line type with lacquered cast iron body and round epoxy coated gasketed cover.
- C. Cleanouts at interior finished floor areas:
 - 1. Lacquered cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.
- D. Cleanouts at interior finished wall areas:
 - 1. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.

2.09 WATER HAMMER ARRESTORS

- A. Water Hammer Arrestors:

1. General
 - a. Stainless steel construction, bellows type sized in accordance with PDI-WH 201, precharged suitable for operation in temperature range minus 100 to 300 degrees F and maximum 250 psi working pressure.
2. For installation on individual, exposed water supplies (where noted on drawings):
 - a. Stainless steel construction, piston-type for exposed installation in individual lavatory, sink, drinking fountain, and other supplies. Maximum 250 degrees F working temperature and maximum 350 psi working pressure.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
- C. Install floor cleanouts at elevation to accommodate finished floor.
- D. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibbs.
- E. Pipe relief from backflow preventer to nearest drain.
- F. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to lavatory sinks or washing machine outlets.
- G. Install air chambers on hot and cold water supply piping to each fixture or group of fixtures (each washroom). Fabricate same size as supply pipe or 3/4 inch minimum, and minimum 18 inches long.

END OF SECTION

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PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Commercial electric water heaters.
- B. Diaphragm-type compression tanks.
- C. In-line circulator pumps.

1.02 SUBMITTALS

- A. Product Data:
 - 1. Provide dimension drawings of water heaters indicating components and connections to other equipment and piping.

PART 2 PRODUCTS

2.01 COMMERCIAL ELECTRIC WATER HEATERS:

- A. Type: Factory-assembled and wired, electric, vertical storage.
- B. Minimum Efficiency Required: ASHRAE Std 90.1 I-P.
- C. Performance: As scheduled on drawings. Heating elements to be wiring for non-simultaneous use.
- D. Electrical Characteristics: As Scheduled on drawings
- E. Accessories:
 - 1. Water Connections: Brass.
 - 2. Dip Tube: Brass.
 - 3. Drain valve.
 - 4. Anode: Magnesium.
 - 5. Temperature and Pressure Relief Valve: ASME labeled.
- F. Tank: Welded steel ASME labeled pressure vessel; glass lining, mounted on steel channel base with lifting lugs, insulated with 2 inch glass fiber; enclosed with 16 gauge, 0.0598 inch steel jacket; baked enamel finish.
- G. Controls: Ventilated control cabinet, factory-wired with solid state progressive sequencing step controller, fuses, magnetic contactors, control transformer, pilot lights indicating main power and heating steps, control circuit toggle switch, electronic low-water (probe-type) cut-off, high temperature limit thermostat, flush-mounted temperature and pressure gauges.
- H. Heating Elements: Flange-mounted immersion elements; individual elements sheathed with Incoloy corrosion-resistant metal alloy, rated less than 75 W/sq in.
- I. Accessories:
 - 1. Water Connections:
 - 2. Brass.Dip Tube:
 - 3. Brass Drain valve.
 - 4. Magnesium Anode Rod
 - 5. Temperature and Pressure Relief Valve
 - 6. ASME labeled

2.02 DIAPHRAGM-TYPE COMPRESSION TANKS

- A. Construction: Welded steel, tested and stamped in accordance with ASME BPVC-VIII-1; supplied with National Board Form U-1, rated for working pressure of 125 psig, with flexible EPDM diaphragm sealed into tank, and steel legs or saddles.
- B. Accessories: Pressure gauge and air-charging fitting, tank drain; precharge to 12 psig.

2.03 IN-LINE CIRCULATOR PUMPS

- A. Casing: Lead Free Bronze, rated for 150 psig working pressure, with stainless steel rotor assembly.
- B. Impeller: 30% glass-filled Noryl.
- C. Shaft: Alloy steel with integral thrust collar and two oil lubricated bronze sleeve bearings.
- D. Seal: mechanical Carbon on silicon carbide.
- E. Drive: closed coupled.
- F. Pump operation: Line Mounted Aquastat to be utilized to control pump operation. Aquastat to include a timer mode for scheduling operation.
- G. Performance: Refer to drawings

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install plumbing equipment in accordance with manufacturer's instructions, as required by code, and complying with conditions required for applicable certifications.
- B. Coordinate system, equipment, and piping work with applicable electrical, drain, and waste support interconnections as included or provided by other trades.
- C. Pumps:
 - 1. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Floor-mounted water closets.
- B. Wall-hung lavatories.
- C. Lavatory faucets.
- D. Undermount sinks.
- E. Sink faucets.
- F. Mop basins.
- G. Bottle Filling Station

1.02 SUBMITTALS

- A. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.
- B. Water Efficiency: EPA Water Sense label is required for all water closets, urinals, lavatory faucets, and showerheads.
- C. Maximum Fixture or Faucet Supply Pressure: 60 psi unless stated otherwise.

2.02 FLOOR-MOUNTED WATER CLOSETS

- A. Floor-mounted, battery-powered electronic flush valve, ADA-compliant.
 - 1. Vitreous china, floor-mounted, bottom outlet toilet, with siphon jet flushing action (1.1 gallons per flush or greater), elongated front rim, 1-1/2-inch top spud, and 2-1/8-inch fully-glazed trapway. Complies with ASME A119.2 and ADA.
 - a. Flush operation: Battery-powered electrical sensor with override flush button.
 - b. Color: White.
 - c. Trap Primer Connection
 - d. Refer to schedule on drawings.

2.03 WALL-HUNG LAVATORIES

- A. Wall-hung, single faucet hole, battery-powered electronic faucet, ADA-compliant.
 - 1. Vitreous china, wall-hung lavatory with single faucet hole, rectangular basin, 2-1/2 inch back, front overflow, and holes for concealed carrier arms. Set at ADA-compliant height. Complies with ASME A119.2 and ADA.
 - a. Faucet operation: Battery-powered electronic sensor.
 - b. Color: White
 - c. Refer to schedule on drawings.

2.04 LAVATORY FAUCETS

- A. Battery-powered electronic, single hole, ADA-compliant.
 - 1. ADA-compliant, battery-powered, polished chrome-plated cast brass sensor faucet with infrared proximity sensor. Unit is furnished with a standard 0.5 GPM aerator and mounting hardware. Furnish with 4 "AA" batteries. Complies with ASME A112.18.1 and Section 1417 of the Safe Drinking Water Act. Refer to schedule on drawings.

2.05 UNDERMOUNT SINKS

- A. Single compartment, ADA-compliant. (Elkay)

1. Single bowl, undermount, ADA sink. Sink is manufactured from 18 gauge, 304 stainless steel with a lustrous satin finish, center drain placement, and sides and bottom pads. Complies with ASME A112.19.3 and ADA. Refer to schedule on drawings.
2. Faucet - See schedule sheet for faucet information.

2.06 MOP BASINS

- A. Basin: (Zurn Z1996-24)
 1. Molded high-density composite basin, PVC drain body, stainless steel strainer and 3-inch gasketed outlet connection. Certifications: Meets ANSI Z124.6, CSA-listed and IAPMO-listed under file # 3561. Refer to schedule on drawings.
- B. Mixing Faucet: (Zurn Z843M1)
 1. Polished chrome-plated cast brass 8" sink faucet with quarter turn ceramic disc cartridges, 3/8" short swivel inlets providing adjustable centers from 7-1/4" to 8-3/4", integral service stops and a 6" centerline cast brass spout with chemical-resistant atmospheric vacuum breaker, 3/4" hose threaded outlet, pail hook and adjustable wall brace. Unit is furnished with 2-1/2" vandal-resistant color-coded brass lever handles. Vacuum breaker is certified to the uniform plumbing code®, ASSE 1001- 2002 and CSA b64-01. (note: atmospheric vacuum breaker not intended for continuous pressure applications.). Refer to schedule on drawings.

2.07 CARRIERS

- A. Lavatories
 1. Enamel-based-coated, ductile iron universal arms, including leveling screws, and soft-set elastomeric locking devices pre-installed. Reversible header plates with slots and integral welded arm sleeves that provide 2" of horizontal adjustment per plate, allowing for horizontal post anchoring adjustment from 13"-21". Uprights, rigid spacing plates, and header plates are factory assembled for easy installation. Carrier system comes complete with enamel-based-coated uprights constructed of carbon-steel tubing that meet ASTM A500 Grade C standards. Uprights also include welded steel plate mounting feet that feature separate bolt patterns for use with either (2) 3/8" or 1/2" anchors per leg. Carrier includes lower and upper rigid spacing plates for a spacing of 17". Upper spacing plate includes horizontal slots for securing water supply and vent piping. Complies with ASME Standard A112.6.1M at all rough-in positions, and meets OSHPD spacing requirements for two anchor per upright installation. Refer to schedule on drawings.

2.08 ELECTRIC DRINKING FOUNTAINS

- A. Standard single, wall-hung, cabinet type, filtered, with light gray finish, ADA-compliant. (Elkay EZS8L)
 1. Wall-mount, ADA cooler. Filtered, light gray granite. Non-Refrigerated stainless steel. Product shall be wall-mount (on wall), for indoor applications, serving 1 station. Unit shall be certified to UL 399. Unit shall be lead-free design which is certified to NSF/ANSI 61 & 372 (lead-free) and meets Federal and State low-lead requirements. Complies with ASME A112.19.3 and ADA. Refer to schedule on drawings.
 2. Filter shall be replaceable type.
 3. Equipped with quick-disconnect, 1/4-turn installation, as well as automatic inlet shut-off valve that closes when filter is removed.
 4. Designed to reduce lead, particles and chlorine. Also reduces odors and discoloration from incoming water reduces odors and discoloration from incoming water.
 5. Filter is tested and certified to NSF 42 and 53 for lead, Class 1 particulate, chlorine taste and odor reduction.
 6. Filter is tested and certified to NSF/ANSI 401 for the reduction of microplastics.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

- B. Verify that electric power is available and of the correct characteristics.
- C. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

3.02 PREPARATION

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.03 INSTALLATION

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Provide chrome-plated rigid or flexible supplies to fixtures with stops, reducers, and escutcheons.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall supports and bolts.
- E. Solidly attach water closets to floor with lag screws. Lead flashing is not intended to hold fixture in place.

3.04 ADJUSTING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.05 CLEANING

- A. Clean plumbing fixtures and equipment.

3.06 PROTECTION

- A. Protect installed products from damage due to subsequent construction operations.
- B. Do not permit use of fixtures by construction personnel.
- C. Repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

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Hangers and Supports for HVAC Piping and Equipment

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Support and attachment components.

1.02 SUBMITTALS

- A. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems, nonpenetrating rooftop supports, post-installed concrete and masonry anchors, and thermal insulated pipe supports.

1.03 QUALITY ASSURANCE

- A. Comply with applicable building code.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Installer Qualifications for Powder-Actuated Fasteners (when specified): Certified by fastener system manufacturer with current operator's license.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

- A. General Requirements:
 - 1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of plumbing work.
 - 2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
 - 3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor of 150%. Include consideration for vibration, equipment operation, and shock loads where applicable.
 - 4. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
 - 5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
 - a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
 - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
 - c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Prefabricated Trapeze-Framed Metal Strut Systems:
 - 1. Strut Channel or Bracket Material:
 - a. Indoor Dry Locations: Use zinc-plated steel or galvanized steel.
 - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
 - 2. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch.
 - 3. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.
 - 4. Accessories: Provide bracket covers, cable basket clips, cable tray clips, clamps, conduit clamps, fire-retarding brackets, j-hooks, protectors, and vibration dampeners.
- C. Strut Channels:
 - 1. ASTM A653/A653M galvanized steel bracket with clamps for surface mounting of piping or plumbing equipment support.

2. Channel or Bracket Kits: Include rods, brackets, end-fixed fittings, covers, clips, and other related hardware required to complete sectional trapeze section for piping or other support.
- D. Channel Nuts:
1. Provide carbon steel channel nut with epoxy copper or zinc finish and long, regular, or short spring.
- E. Hanger Rods:
1. Threaded zinc-plated steel unless otherwise indicated.
 2. Minimum Size, Unless Otherwise Indicated or Required:
 - a. Equipment Supports: 1/2 inch diameter.
 - b. Piping up to 1 inch: 1/4 inch diameter.
 - c. Piping larger than 1 inch: 3/8 inch diameter.
 - d. Trapeze Support for Multiple Pipes: 3/8 inch diameter.
- F. Cable Hanging System Kits:
1. Provide cable-wire in bulk or precut lengths with respective cable hangers as required to hold minimum weight of 120 lb.
 2. Accessories: Provide brackets, clip or c-clip hangers, covers, and y-hook hangers.
- G. Pipe Supports:
1. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
 2. Liquid Temperatures Up To 122 degrees F:
 - a. Overhead Support: MSS SP-58 Types 1, 3 through 12.
 - b. Support From Below: MSS SP-58 Types 35 through 38.
 3. Operating Temperatures from 122 to 446 degrees F:
 - a. Overhead Support: MSS SP-58 Type 1 or 3 through 12, with appropriate saddle of MSS SP-58 Type 40 for insulated pipe.
- H. Pipe Stanchions:
1. Material: Malleable iron, ASTM A47/A47M; or carbon steel, ASTM A36/A36M.
 2. Provide coated or plated saddles to isolate steel hangers from dissimilar metal tube or pipe.
 3. For pipe runs, use stanchions of same type and material where vertical adjustment is required for stationary pipe.
- I. Beam Clamps:
1. MSS SP-58 types 19 through 23, 25 or 27 through 30 based on required load.
 2. Beam C-Clamp: MSS SP-58 type 23, malleable iron and steel with plain, stainless steel, and zinc finish.
 3. Small or Junior Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish. For inverted usage provide manufacturer listed size(s).
 4. Wide Mouth Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish.
 5. Centerload Beam Clamp with Extension Piece: MSS SP-58 type 30, malleable iron with plain finish.
 6. FM (AG) and UL (DIR) Approved Beam Clamp: MSS SP-58 type 19, plain finish,
 7. Provide clamps with hardened steel cup-point set screws and lock-nuts for anchoring in place.
 8. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
- J. Strut Clamps:
1. Pipe Clamp: Two-piece rigid, universal, or outer diameter type, carbon steel with epoxy copper or zinc finish.
 2. Cushioned Pipe or Tubing Strut Clamp: Provide strut clamp with thermoplastic elastomer cushion having dielectric strength of 670 V/mil.

- K. Insulation Clamps:
 1. Two bolt-type clamps designed for installation under insulation.
 2. Material: Carbon steel with epoxy copper or zinc finish.
- L. Pipe Hangers:
 1. Split Ring Hangers:
 - a. Provide hinged split ring and yoke roller hanger with epoxy copper or plain finish.
 - b. Material: ASTM A47/A47M malleable iron or ASTM A36/A36M carbon steel.
 - c. Provide hanger rod and nuts of the same type and material for a given pipe run.
 - d. Provide coated or plated hangers to isolate steel hangers from dissimilar metal tube or pipe.
 2. Swivel Ring Hangers, Adjustable:
 - a. MSS SP-58 Type 10, epoxy-painted, zinc-colored.
 - b. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
 - c. FM (AG) and UL (DIR) listed for specific pipe size runs and loads.
 3. Clevis Hangers, Adjustable:
 - a. Felt-Lined: MSS SP-58 Type 1, zinc-plated, silicone-free carbon steel.
 - b. Standard-Duty: MSS SP-58 Type 1, zinc-colored, epoxy plated.
 - c. UL (DIR) listed: Pipe sizes 2-1/2 to 8 inch.
- M. Nonpenetrating Rooftop Supports for Low-Slope Roofs:
 1. Provide steel support curbs (fully enclosed with top cap) to support HVAC equipment mounted above roof. Support curbs to be rubber base that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified.
 2. Frames:
 - a. Material: ASTM A 653 G90 hot-dipped galvanized steel. Minimum 18 gauge or heavier gauge as engineered by manufacturer.
 - b. Corners: Mitered and welded. Bolted connections are not accepted.
 - c. Base Plates: Integral to frame and welded.
 - d. Internal Reinforcement: RPPF-1, 2 and 3 styles are reinforced with 1 inch by 1 inch angles on any side of curb 3 feet or more in length.
 - e. 3/4" plywood top with minimum 18ga. galvanized steel cap.
 - f. Wood Nailers: Factory installed, pressure treated.
 3. Insulation: RPPF-1, 2 & 3 styles are insulated with 1-1/2 inch thick three-pound density fiberglass insulation.
 4. Construct Platform Roof Curbs to match roof slope with plumb and level top surface for mounting equipment.
 5. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
 6. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports.
 7. Flashing: Provide and install flashing and counter flashing. Flash equipment support curb to existing or new roof.
 8. Roof to match existing roof and attach to the new curb cant.
 - a. Applications where the combined curb weight and the equipment weight would damage roof and or insulation, contractor to cut back insulation under the curb perimeter and provide and install treated wood to support the combined weight of the curb to the roof structure.
- N. Penetrating Rooftop Supports for Low-Slope Roofs:
 1. Provide steel support curbs (fully enclosed with top cap) to support HVAC equipment mounted above roof. Support curbs to be galvanized steel base that rest on top of

- support framing, requiring attachment to the roof structure assembly, with support fixtures as specified.
2. Frames:
 - a. Material: ASTM A 653 G90 hot-dipped galvanized steel. Minimum 18 gauge or heavier gauge as engineered by manufacturer.
 - b. Corners: Mitered and welded. Bolted connections are not accepted.
 - c. Base Plates: Integral to frame and welded.
 - d. Internal Reinforcement: RPPF-1, 2 and 3 styles are reinforced with 1 inch by 1 inch angles on any side of curb 3 feet or more in length.
 - e. 3/4" plywood top with minimum 18ga. galvanized steel cap.
 - f. Wood Nailers: Factory installed, pressure treated.
 3. Insulation: RPPF-1, 2 & 3 styles are insulated with 1-1/2 inch thick three-pound density fiberglass insulation.
 4. Construct Platform Roof Curbs to match roof slope with plumb and level top surface for mounting equipment.
 5. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
 6. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports.
 7. Flashing: Provide and install flashing and counter flashing. Flash equipment support curb to existing or new roof.
 8. Roof to match existing roof and attach to the new curb cant.
 9. Applications where the combined curb weight and the equipment weight would damage roof and or insulation, contractor to cut back insulation under the curb perimeter and provide and install treated wood to support the combined weight of the curb to the roof structure.
 10. Mounting Height: Provide minimum clearance of 12 inches under supported component to top of roofing. This distance to be measured from the top of the roof insulation to the supporting edge of the curb.
 11. Mounting Height: Provide minimum clearance of 12 inches under supported component to top of roofing. This distance to be measured from the top of the roof insulation to the supporting edge of the curb.
 12. Anchors and Fasteners:
 - a. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
 - b. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
 - c. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
 - d. Hollow Masonry: Use toggle bolts.
 - e. Hollow Stud Walls: Use toggle bolts.
 - f. Steel: Use beam-ceiling clamps, beam clamps, machine bolts, or welded threaded studs.
 - g. Beam Ceiling Flanges: ASTM A47/A47M Grade 32510, malleable iron or stainless steel with copper, plain, stainless steel, or zinc finish.
 - h. Sheet Metal: Use sheet metal screws.
 - i. Wood: Use wood screws.
 - j. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
 - 1) Comply with MFMA-4.
 - 2) Channel Material: Use galvanized steel.
 - 3) Manufacturer: Same as manufacturer of metal channel (strut) framing system.
 13. Pipe Installation Accessories:
 - a. Copper Pipe Supports:

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.
- C. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.
- D. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- E. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- G. Equipment Support and Attachment:
 - 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
 - 2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 - 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 - 4. Unless otherwise indicated, mount floor-mounted equipment on properly sized 4 inch high concrete pad.
 - 5. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- H. Preset Concrete Inserts: Use manufacturer-provided closure strips to inhibit concrete seepage during concrete pour.
- I. Secure fasteners according to manufacturer's recommended torque settings.
- J. Remove temporary supports.

END OF SECTION

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Identification for HVAC Piping and Equipment**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Nameplates.
- B. Tags.
- C. Adhesive-backed duct markers.
- D. Pipe markers.
- E. Ceiling tacks.

1.02 SUBMITTALS

- A. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

PART 2 PRODUCTS**2.01 IDENTIFICATION APPLICATIONS**

- A. Air Handling Units: Nameplates.
- B. Dampers: Ceiling tacks, where located above lay-in ceiling.
- C. Ductwork: Adhesive-backed duct markers.
- D. Heat Transfer Equipment: Nameplates.

2.02 NAMEPLATES

- A. Letter Color: White.
- B. Letter Height: 1/4 inch.
- C. Background Color: Black.
- D. Plastic: Comply with ASTM D709.

2.03 TAGS

- A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.
- B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.
- C. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

2.04 ADHESIVE-BACKED DUCT MARKERS

- A. Material: High gloss acrylic adhesive-backed vinyl film 0.0032 inch; printed with UV and chemical resistant inks.
- B. Color: Yellow/Black.

2.05 PIPE MARKERS

- A. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.

2.06 CEILING TACKS

- A. Description: Steel with 3/4 inch diameter color coded head.

PART 3 EXECUTION**3.01 PREPARATION**

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

- A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install tags with corrosion resistant chain.
- C. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
- D. Use tags on piping 3/4 inch diameter and smaller.
 - 1. Identify service, flow direction, and pressure.
 - 2. Install in clear view and align with axis of piping.
 - 3. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
- E. Apply ASME A13.1 Pipe Marking Rules for plastic tape pipe markers:
 - 1. Place pipe marker adjacent to changes in direction.
 - 2. Place pipe marker adjacent each valve port and flange end.
 - 3. Place pipe marker at both sides of floor and wall penetrations.
 - 4. Place pipe marker every 25 to 50 feet interval of straight run.
- F. Install ductwork with acrylic adhesive-backed vinyl film tags. Identify with air handling unit identification number and area served. Locate identification at air handling unit, at each side of penetration of structure or enclosure, and at each obstruction.
- G. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION

Testing, Adjusting, and Balancing for HVAC**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Testing, adjustment, and balancing of air systems.
- B. Testing, adjustment, and balancing of refrigerating systems.
- C. Measurement of final operating condition of HVAC systems.

1.02 REFERENCE STANDARDS

- A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition; 2016.
- B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems; 2008, with Errata (2019).

1.03 SUBMITTALS

- A. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
 - 1. Include at least the following in the plan:
 - a. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
 - b. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
 - c. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
 - d. Final test report forms to be used.
 - e. Procedures for formal deficiency reports, including scope, frequency and distribution.
- B. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
 - 1. Revise TAB plan to reflect actual procedures and submit as part of final report.
 - 2. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect and for inclusion in operating and maintenance manuals.
 - 3. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
 - 4. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
 - 5. Units of Measure: Report data in both I-P (inch-pound) and SI (metric) units.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 GENERAL REQUIREMENTS**

- A. Perform total system balance in accordance with one of the following:
 - 1. AABC (NSTSB), AABC National Standards for Total System Balance.
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.
- C. TAB Agency Qualifications:
 - 1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.

3.02 EXAMINATION

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:

1. Systems are started and operating in a safe and normal condition.
 2. Temperature control systems are installed complete and operable.
 3. Proper thermal overload protection is in place for electrical equipment.
 4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
 5. Duct systems are clean of debris.
 6. Fans are rotating correctly.
- B. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.
- C. Beginning of work means acceptance of existing conditions.

3.03 PREPARATION

- A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Architect to facilitate spot checks during testing.
- B. Provide additional balancing devices as required.

3.04 ADJUSTMENT TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 10 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 10 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

3.05 RECORDING AND ADJUSTING

- A. Field Logs: Maintain written logs including:
1. Running log of events and issues.
 2. Discrepancies, deficient or uncompleted work by others.
 3. Contract interpretation requests.
 4. Lists of completed tests.
- B. Ensure recorded data represents actual measured or observed conditions.
- C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- D. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

3.06 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- E. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

3.07 MINIMUM DATA TO BE REPORTED

- A. Electric Motors:
1. Model/Frame.
 2. HP/BHP.
 3. Phase, voltage, amperage; nameplate, actual, no load.

4. RPM.
- B. Air Cooled Condensers:
1. Identification/number.
 2. Location.
 3. Manufacturer.
 4. Model number.
 5. Serial number.
 6. Entering DB air temperature, design and actual.
 7. Leaving DB air temperature, design and actual.
 8. Number of compressors.
- C. Cooling / Heating Coils:
1. Identification/number.
 2. Location.
 3. Service.
 4. Manufacturer.
 5. Air flow, design and actual.
 6. Entering air DB temperature, design and actual.
 7. Entering air WB temperature, design and actual.
 8. Leaving air DB temperature, design and actual.
 9. Leaving air WB temperature, design and actual.
 10. Saturated suction temperature, design and actual.
 11. Air pressure drop, design and actual.
- D. Air Moving Equipment:
1. Location.
 2. Manufacturer.
 3. Model number.
 4. Serial number.
 5. Arrangement/Class/Discharge.
 6. Air flow, specified and actual.
 7. Return air flow, specified and actual.
 8. Outside air flow, specified and actual.
 9. Total static pressure (total external), specified and actual.
 10. Inlet pressure.
 11. Discharge pressure.
 12. Fan RPM.

END OF SECTION

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PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Duct insulation.
- B. Duct liner.
- C. Jacketing and accessories.

1.02 REFERENCE STANDARDS

- A. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- B. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
- C. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013 (Reapproved 2019).
- D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).
- E. ASTM C916 - Standard Specification for Adhesives for Duct Thermal Insulation; 2020.
- F. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material); 2019.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- H. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
- I. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- J. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
- K. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER, FLEXIBLE

- A. Manufacturer:
- B. Insulation: ASTM C553; flexible, noncombustible blanket.
 - 1. K value: 0.36 at 75 degrees F, when tested in accordance with ASTM C518.
 - 2. Maximum Service Temperature: 250 degrees F.
 - 3. Maximum Water Vapor Absorption: 5.0 percent by weight.
- C. Vapor Barrier Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
 - 3. Secure with pressure-sensitive tape.

2.03 GLASS FIBER, RIGID

- A. Insulation: ASTM C612; rigid, noncombustible blanket.
 - 1. K Value: 0.24 at 75 degrees F, when tested in accordance with ASTM C518.
 - 2. Maximum Service Temperature: 450 degrees F.
 - 3. Maximum Water Vapor Absorption: 5.0 percent.
 - 4. Maximum Density: 8.0 pcf.
- B. Vapor Barrier Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
 - 3. Secure with pressure-sensitive tape.

2.04 JACKETING AND ACCESSORIES

- A. Canvas Jacket: UL listed 6 oz/sq yd plain weave cotton fabric treated with dilute fire-retardant lagging adhesive.
- B. Aluminum Jacket:
 - 1. Comply with ASTM B209/B209M, Temper H14, minimum thickness of 0.016 inch with factory-applied polyethylene and kraft paper moisture barrier on the inside surface.
 - 2. Thickness: 0.016 inch sheet.
 - 3. Finish: Smooth.
 - 4. Joining: Longitudinal slip joints and 2 inch laps.
 - 5. Fittings: 0.016 inch thick die-shaped fitting covers with factory-attached protective liner.
 - 6. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.
 - 7. Sealing of Jacket: All aluminum joints to be sealed with clear silicone caulking.

2.05 DUCT LINER

- A. Glass Fiber Insulation: Non-corrosive, incombustible glass fiber complying with ASTM C1071; flexible blanket, rigid board, and preformed round liner board; impregnated surface and edges coated with poly vinyl acetate polymer, acrylic polymer, or black composite.
 - 1. Fungal Resistance: No growth when tested according to ASTM G21.
 - 2. Apparent Thermal Conductivity: Maximum of 0.31 at 75 degrees F.
 - 3. Rated Velocity on Coated Air Side for Air Erosion: 5,000 fpm, minimum.
 - 4. Minimum Noise Reduction Coefficients:
 - a. 1 inch Thickness: 0.45.
- B. Adhesive: Waterproof, fire-retardant type, ASTM C916.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Test ductwork for design pressure prior to applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Insulated Ducts Conveying Air Below Ambient Temperature:
 - 1. Provide insulation with vapor barrier jackets.
 - 2. Finish with tape and vapor barrier jacket.
 - 3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
 - 4. Insulate entire system, including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- D. Duct and Plenum Liner Application:
 - 1. Adhere insulation with adhesive for 90 percent coverage.

2. Secure insulation with mechanical liner fasteners. Refer to SMACNA (DCS) for spacing.
3. Seal and smooth joints. Seal and coat all transverse joints and longitude seams.
4. Seal liner surface penetrations with adhesive.
5. Duct dimensions indicated are net inside dimensions required for airflow. Increase duct size to allow for insulation thickness.

3.03 SCHEDULES

- A. Duct Sealing
 1. Refer to the specification section for duct construction.
- B. Insulation:
 1. Exhaust Ducts Within 10 ft of Exterior Openings: 1-1/2" Flexible Duct Wrap with Vapor Barrier Aluminum Film Jacket
 2. Outside Air Intake Ducts: 1-1/2" Flexible Duct Wrap with FSK Vapor Barrier Aluminum Film Jacket.
 3. Plenums (Supply and Return): 1-1/2" Rigid Fiberglass insulation with Canvas Jacket
 4. Supply Ductwork:
 - a. Square and Round Ductwork:
 - 1) Square Ductwork downstream of VAV terminal Units: 1" duct liner.
 - 2) Round Ductwork downstream of VAV terminal Units: 1-1/2" Flexible Fiberglass insulation with FSK Vapor Barrier Aluminum Jacket
 - 3) Constant Volume applications: 1" Duct Liner or 1-1/2 inch wrap with FSK Vapor Barrier Aluminum Jacket as indicated on drawings.
 5. Return Ductworks:
 - a. Square and Round Ductwork:
 - 1) Square Ductwork: 1-1/2 inch wrap with FSK Vapor Barrier Aluminum Film Jacket
 - 2) Round Ductwork: 1-1/2 inch wrap with FSK Vapor Barrier Aluminum Film Jacket
 - 3) Ducts installed and Exposed to Outdoors: 2" Rigid Fiberglass with Aluminum Jacket

END OF SECTION

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PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Piping.
- B. Refrigerant.
- C. Moisture and liquid indicators.
- D. Valves.
- E. Filter-driers.
- F. Expansion valves.

1.02 REFERENCE STANDARDS

- A. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.
- B. ASME B31.5 - Refrigeration Piping and Heat Transfer Components; 2022.
- C. ASTM B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service; 2023.
- D. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2019.
- E. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).

PART 2 PRODUCTS

2.01 SYSTEM DESCRIPTION

- A. Filter-Driers:
 - 1. Use a filter-drier immediately ahead of liquid-line controls, such as thermostatic expansion valves, solenoid valves, and moisture indicators.

2.02 PIPING

- A. Copper Tube: ASTM B280, H58 hard drawn.
 - 1. Fittings: ASME B16.22 wrought copper.
 - 2. Joints: Braze, AWS A5.8M/A5.8 BCuP silver/phosphorus/copper alloy.
- B. Pipe Supports and Anchors:
 - 1. Provide hangers and supports that comply with MSS SP-58.
 - a. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
 - 2. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
 - 3. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - 4. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
 - 5. Vertical Support: Steel riser clamp.
 - 6. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
 - 7. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.
 - 8. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.03 MOISTURE AND LIQUID INDICATORS

- A. Indicators: Single port type, UL listed, with copper or brass body, flared or soldered ends, sight glass, color coded paper moisture indicator with removable element cartridge and plastic cap; for maximum temperature of 200 degrees F and maximum working pressure of 500 psi.

2.04 VALVES

- A. Service Valves:

1. Forged brass body with copper stubs, brass caps, removable valve core, integral ball check valve, flared or soldered ends, for maximum pressure of 500 psi.

2.05 FILTER-DRIERS

- A. Cores: Molded or loose-fill molecular sieve desiccant compatible with refrigerant, activated alumina, activated charcoal, and filtration to 40 microns, with secondary filtration to 20 microns; of construction that will not pass into refrigerant lines.
- B. Construction: UL listed.
 1. Replaceable Core Type: Steel shell with removable cap.
 2. Sealed Type: Copper shell.
 3. Connections: As specified for applicable pipe type.

2.06 ELECTRONIC EXPANSION VALVES

- A. Valve:
 1. Brass body with flared or soldered connection, needle valve with floating needle and machined seat, stepper motor drive.

PART 3 EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain-end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

- A. Install refrigeration specialties in accordance with manufacturer's instructions. Refer to equipment specification sections for additional refrigerant piping requirements.
- B. Route piping in orderly manner, with plumbing parallel to building structure, and maintain gradient.
- C. Install piping to conserve building space and avoid interference with use of space.
- D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- E. Inserts:
 1. Provide inserts for placement in concrete formwork.
 2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
 3. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above slab.
- F. Pipe Hangers and Supports:
 1. Install in accordance with ASME B31.5.
 2. Support horizontal piping as indicated.
 3. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 4. Provide copper plated hangers and supports for copper piping.
- G. Flood piping system with nitrogen when brazing.
- H. Where pipe support members are welded to structural building frame, brush clean, and apply one coat of zinc rich primer to welding.
- I. Insulate piping and equipment.

3.03 FIELD QUALITY CONTROL

- A. Test refrigeration system in accordance with ASME B31.5.
- B. Pressure test system with dry nitrogen to 200 psi. Perform final tests at 27 inches vacuum and 200 psi using halide torch. Test and repair piping until no leakage.

3.04 SCHEDULES

A. Hanger Spacing for Copper Tubing.

1. 1/2 inch, 5/8 inch, and 7/8 inch OD: Maximum span, 5 feet; minimum rod size, 1/4 inch.
2. 1-1/8 inch OD: Maximum span, 6 feet; minimum rod size, 1/4 inch.
3. 1-3/8 inch OD: Maximum span, 7 feet; minimum rod size, 3/8 inch.
4. 1-5/8 inch OD: Maximum span, 8 feet; minimum rod size, 3/8 inch.

END OF SECTION

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PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal ducts.
- B. Flexible ducts.
- C. Air plenums and casings.
- D. Duct Sealing

1.02 SUBMITTALS

- A. Product Data: Provide data for duct materials.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Provide UL Class 1 ductwork, fittings, hangers, supports, and appurtenances in accordance with NFPA 90A and SMACNA (DCS) guidelines unless stated otherwise.
- B. Provide metal duct unless otherwise indicated. Fibrous glass duct can be substituted at the Contractor's option.
- C. Duct Shape and Material in accordance with Allowed Static Pressure Range:
 - 1. Round Spiral: Plus or minus 2 in-wc of galvanized steel.
 - 2. Round Snap Lock: Plus or minus 1 in-wc of galvanized steel.
 - 3. Rectangular: Plus or minus 2 in-wc of galvanized steel.
 - 4. Flexible Duct: Plus or minus 1/2 in-wc.
- D. Duct Sealing and Leakage in accordance with Static Pressure Class:
 - 1. All ductwork to be sealed - refer to sealing requirement in this specification section.
- E. Duct Fabrication Requirements:
 - 1. Duct and Fitting Fabrication and Support: SMACNA (DCS) including specifics for continuously welded round and oval duct fittings.
 - 2. Use reinforced and sealed sheet-metal materials at recommended gauges for indicated operating pressures or pressure class.
 - 3. Construct tees, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide airfoil turning vanes of perforated metal with glass fiber insulation.
 - 4. Provide turning vanes of perforated metal with glass fiber insulation when acoustical lining is indicated.
 - 5. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
 - 6. Provide turning vanes of perforated metal with glass fiber insulation when an acoustical lining is required.
 - 7. Where ducts are connected to exterior wall louvers and duct outlet is smaller than louver frame, provide blank-out panels sealing louver area around duct. Use same material as duct, painted black on exterior side; seal to louver frame and duct.
- F. Low Pressure Supply (Heating Systems): 1 inch wg pressure class, galvanized steel.
- G. Low Pressure Supply (System with Cooling Coils): 1 inch wg pressure class, galvanized steel.
- H. Medium and High Pressure Supply: Greater than 1 inch w.g. pressure class, galvanized steel.
- I. Return and Relief: 1 inch wg pressure class, galvanized steel.
- J. General Exhaust: 1 inch wg pressure class, galvanized steel.
- K. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.

- L. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide air foil turning vanes of perforated metal with glass fiber insulation.
- M. Provide double wall turning vanes of perforated metal with glass fiber insulation when acoustical lining is indicated.
- N. Where ducts are connected to exterior wall louvers and duct outlet is smaller than louver frame, provide blank-out panels sealing louver area around duct. Use same material as duct, painted black on exterior side; seal to louver frame and duct.
- O. Rectangular Transverse Joint Connectors.
 - 1. Engineered slide-on transverse duct connectors systems will be only square duct connection system accepted.
 - 2. Slide-on Transverse Joint Connectors.
 - a. Duct constructed using engineered self-sealing slide-on connector systems must be submitted and conform to manufacturer's published duct construction standards and guidelines for joint classification, sheet metal gauge, intermediate and joint reinforcement size and spacing, unless otherwise specified.
 - b. Manufacturer of engineered connector system must have certified independent performance testing for reinforcement classification, sheet and joint deflection, seismic stability, static pressures of 12" w.g. to 12" negative w.g., and leakage performance.
 - c. All components of the engineered system must be clearly and permanently embossed with the manufacturer's name, model number or identifying marking.
 - d. Engineered slide-on flange connector systems shall be self-sealing to all duct wall alloys and consist of injected non-drying, non-oxidizing high viscosity synthetic polymer-based mastic, meets ASTM D2202 and tack strength >2,000 psi. Mastic shall be LEED compliant, meet UL 723 (ASTM E-84-80), all applicable SCAQMD standards and ASTM G21 mold and mildew resistant.
 - e. High performance Butyl rubber gasket must be independently tested with and applied per the manufacturer's specific instructions on all connections, except breakaway connections or as indicated herein. High density, Closed Cell Neoprene gasket must be applied per the manufacturer's instructions on all breakaway connections.
 - f. All duct installed using engineered connectors must adhere to the manufacturer's published assembly and installation guidelines for all standard, breakaway, roof-top or specialty connections unless otherwise specified. No substitution of manufacturers engineered components or gaskets is permitted.
- P. Longitudinal Seams:
 - 1. All "rectangular" duct longitudinal seams shall be Pittsburgh lock seam.
 - 2. All longitudinal seams shall be sealed with an approval duct sealant.

2.02 OTHER FABRICATION GUIDELINES

- A. General Fabrication Requirements: Comply with SMACNA's 2005 "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated. But, duct wall thickness to be minimum 22 gage except where any welding other than longitudinal seams is performed, then the minimum thickness shall be 18 gage, and, no Crimp joints allowed.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's 2005 "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible." But, transverse (girth) joints T-4, 9, 17 through 20, and 23 not permitted.
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's 2005 "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct

support, support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible." But, button punch snaplock seams are not permitted

2.03 METAL DUCTS

- A. Material Requirements:
 - 1. Galvanized Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.
- B. Round Spiral Duct:
 - 1. Round spiral lock seam duct with galvanized steel outer wall.
- C. Connectors, Fittings, Sealants, and Miscellaneous:
 - 1. Fittings: Manufacture with solid inner wall of perforated galvanized steel.
 - 2. Transverse Duct Connection System: SMACNA "E" rated rigid class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips in accordance with SMACNA (DCS).

2.04 FLEXIBLE DUCTS

- A. Flexible Air Ducts:
 - 1. UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound spring steel wire.
 - 2. Pressure Rating: From 10 in-wc to 1 in-wc negative.
 - 3. Maximum Velocity: 4,000 fpm.
 - 4. Temperature Range: Minus 20 to 210 degrees F.

2.05 AIR PLENUMS AND CASINGS

- A. Fabricate in accordance with SMACNA (DCS) for indicated operating pressures indicated.
- B. Minimum Fabrication Requirements:
 - 1. Fabricate acoustic plenum or casing with reinforcing turned inward.
 - 2. Provide 16-gauge, 0.059-inch sheet steel back facing and 22-gauge, 0.029-inch perforated sheet steel front facing with 3/32 inch diameter holes on 5/32 inch centers.
 - 3. Construct panels 3 inches thick, packed with 4.5 pcf minimum glass fiber insulation media, on inverted channel of 16-gauge, 0.059-inch sheet steel.
 - 4. Mount floor-mounted plenum or casings on 4-inch high concrete curbs. At floor, rivet panels on 8-inch centers to angles. Where floors are acoustically insulated, provide liner of galvanized 18-gauge, 0.052-inch expanded metal mesh supported at 12-inch centers, turned up 12 inches at sides with sheet metal shields.
- C. Access Doors:
 - 1. Install hinged access doors where indicated or required for access to equipment for cleaning and inspection.
 - 2. Reinforce door frames with steel angles tied to horizontal and vertical plenum supporting angles.
 - 3. Provide clear wire glass observation ports, minimum 6 by 6 inch size.
- D. Mount floor mounted casings on concrete curbs. Refer to drawings for concrete curb height. At floor, rivet panels on 8 inch centers to angles. Where floors are acoustically insulated, provide liner of galvanized 18 gauge, 0.0478 inch expanded metal mesh supported at 12 inch centers, turned up 12 inches at sides with sheet metal shields.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install, support, and seal ducts in accordance with SMACNA (DCS).
- B. During construction, provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering the ductwork system.
- C. Flexible Ducts: Connect to metal ducts with adhesive and drawband.
- D. Duct sizes indicated are precise inside dimensions. For lined ducts, maintain sizes inside lining.

- E. Provide openings in ductwork as indicated to accommodate thermometers and controllers. Provide pilot tube openings as indicated for testing of systems, complete with metal can with spring device or screw to insure against air leakage. For openings, insulate ductwork and install insulation material inside a metal ring.
- F. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- G. Use crimp joints with or without bead for joining round duct sizes 12 inches and smaller with crimp in direction of air flow.
- H. Duct Sealing. All ductwork to be sealed on longitude and transverse seams with water base duct sealer. Sealing to be in accordance to SMANCA standards. In addition, snap lock duct that is used for air distribution runout, to have three sheet metal screws installed along the longitude run of each section and the joint shall be sealed with Water Based duct sealer prior to insulation being applied.
 - 1. Square Ductwork (both internally lined and external wrapped)
 - a. All seams to be sealed with duct sealer. Apply a 2-inch band of DP 1010 around outside of joint, covering all screws.
 - b. The applies to longitudinal and transverse connections and joints
 - 2. For round and oval spiral duct:
 - a. Apply duct sealer to the male section of the fitting or to the inside slip duct coupling. Secure with sheet metal screws per manufacturers requirements. Apply a 2-inch band of DP 1010 around outside of joint, covering all screws.
 - b. The applies to longitudinal and transverse connections and joints
 - 3. For flexible duct:
 - a. Apply duct sealer at a rate of 40-80 sq. ft. per gallon (20-40 mils) between the end of the duct and the collar in a 2-inch band.
- I. Use double nuts and lock washers on threaded rod supports.
- J. Connect terminal units to supply ducts directly or with one foot maximum length of flexible duct. Do not use flexible duct to change direction.
- K. Connect diffusers or light troffer boots to low-pressure ducts directly or with 5 feet maximum length of flexible duct held in place with strap or clamp.
- L. Set plenum doors at 6 to 12 inches above floor. Arrange door swings so that fan static pressure holds door in closed position.
- M. At exterior wall louvers, seal duct to louver frame and install blank-out panels.

3.02 CLEANING (NEW INSTALLED DUCTWORK)

- A. Clean duct system by forcing air at high velocity through duct to remove accumulated dust. Clean half the system at a time to obtain sufficient air. Protect equipment that could be harmed by excessive dirt with temporary filters or bypass during cleaning.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Air turning devices
- B. Duct access doors.
- C. Duct test holes.
- D. Fire dampers.
- E. Flexible duct connectors.
- F. Volume control dampers.
- G. Miscellaneous Products:
 - 1. Damper operators.
 - 2. Duct opening closure film.

1.02 REFERENCE STANDARDS

- A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2018.
- B. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
- C. UL 33 - Safety Heat Responsive Links for Fire-Protection Service; Current Edition, Including All Revisions.
- D. UL 555 - Standard for Fire Dampers; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. Product Data: Provide for shop-fabricated assemblies including volume control dampers, duct access doors, duct test holes, and hardware used. Include electrical characteristics and connection requirements.

PART 2 PRODUCTS

2.01 AIR TURNING DEVICES

- A. Multi-blade device with blades aligned in short dimension; steel construction; with individually adjustable blades, mounting straps.

2.02 DUCT ACCESS DOORS

- A. Fabrication: Rigid and close fitting of galvanized steel with sealing gaskets and quick-fastening locking devices. For insulated ducts, install minimum 1-inch thick insulation with sheet metal cover.
 - 1. Less Than 12 inches Square: Secure with sash locks.
 - 2. Up to 18 inches Square: Provide two hinges and two sash locks.
 - 3. Up to 24 by 48 inches: Three hinges and two compression latches with outside and inside handles.

2.03 DUCT TEST HOLES

- A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

2.04 FIRE DAMPERS

- A. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.
- B. Static Fire Dampers
 - 1. Ratings:
 - a. Fire Resistance:
 - 1) Damper shall have a UL 555 fire resistance rating of 1 1/2 hours.
 - 2. Fire Closure Temperature:

- a. 165°F
- 3. Static Fire Damper (FD) Construction:
 - a. Frame:
 - 1) Galvanized steel in gauges required by manufacturer's UL listing (FD-100 and FD-300 series)
 - b. Blades:
 - 1) Galvanized steel curtain style (FD-100 and FD-300 series)
 - c. Sleeves:
 - 1) Damper shall be supplied with a factory sleeve.
 - d. Retaining Angles:
 - 1) Damper shall be supplied with factory retaining angles sized to provide installation overlap in accordance with the manufacturer's UL listing.
 - e. Fire Closure Device:
 - 1) Damper shall be supplied with fusible link.
 - f. Mounting:
 - 1) Vertical
 - g. Finish:
 - 1) Galvanized steel (FD-100 and FD-300 series)
 - h. Duct Transition Connection:
 - 1) Type A
 - i. Source Quality Control
 - 1) Factory Tests: Factory cycle damper assemblies to assure proper operation.
- C. Horizontal Dampers: Galvanized steel, 22-gauge, 0.0299-inch frame, stainless steel closure spring, and lightweight, heat-retardant, non-asbestos fabric blanket.
- D. Multiple Blade Dampers: 16-gauge, 0.0598-inch galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, 1/8 by 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock.
- E. Fusible Links: UL 33, separate at 160 degrees F with adjustable link straps for combination fire/balancing dampers.

2.05 FLEXIBLE DUCT CONNECTORS

- A. Fabricate in accordance with SMACNA (DCS) and as indicated.
- B. Flexible Duct Connections: Fabric crimped into metal edging strip.
 - 1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz/sq yd.
 - a. Net Fabric Width: Approximately 2 inches wide.
 - 2. Metal: 3 inches wide, 24 gauge, 0.0239 inch thick galvanized steel.

2.06 VOLUME CONTROL DAMPERS

- A. Fabricate in accordance with SMACNA (DCS) and as indicated.
- B. Single Blade Dampers:
 - 1. Fabricate for duct sizes up to 6 by 30 inch.
 - 2. Blade: 24 gauge, 0.0239 inch, minimum.
- C. Multi-Blade Damper: Fabricate consisting of opposed blades with maximum blade sizes 8 by 72 inches. Assemble center- and edge-crimped blades in prime-coated or galvanized-channel frame with suitable hardware.
 - 1. Blade: 18 gauge, 0.0478 inch, minimum.
- D. End Bearings: Except in round ducts 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon, thermoplastic elastomer, or sintered bronze bearings.
- E. Quadrants:
 - 1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.

2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
3. Where rod lengths exceed 30 inches provide regulator at both ends.

2.07 MISCELLANEOUS PRODUCTS

- A. Duct Opening Closure Film: Mold-resistant, self-adhesive film to keep debris out of ducts during construction.
 1. Thickness: 2 mils.
 2. High tack water based adhesive.
 3. UV stable light blue color.
 4. Elongation Before Break: 325 percent, minimum.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). See Section 23 3100 for duct construction and pressure class.
- B. Provide duct test holes where indicated and required for testing and balancing purposes.
- C. Provide fire dampers, combination fire and smoke dampers, and smoke dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by Authorities Having Jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
- D. Demonstrate re-setting of fire dampers to Owner's representative.
- E. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum two duct widths from duct take-off.
- F. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION

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PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Ceiling exhaust fans.

1.02 SUBMITTALS

- A. Product Data: Provide data on fans and accessories, including fan curves with specified operating point plotted, power, rpm, sound power levels at rated capacity, and electrical characteristics and connection requirements.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

PART 2 PRODUCTS

2.01 CEILING EXHAUST FANS

- A. Centrifugal Fan Unit: Direct driven ECM with galvanized steel housing lined with acoustic insulation, resiliently mounted motor, gravity backdraft damper in discharge.
- B. Disconnect Switch: Cord and plug-in housing for thermal overload protected motor.
- C. Grille: Molded white plastic.
- D. Backdraft Damper: Fan to be equipped with integral backdraft damper
- E. Control: Fan to be controlled by Wall Switch or Occupancy Sensor as scheduled on drawings
- F. Provide with curb mounted roof cap or wall cap as scheduled on drawings.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure roof exhausters with cadmium plated steel lag screws to roof curb.
- C. Extend ducts to roof exhausters into roof curb. Counterflash duct to roof opening.
- D. Provide backdraft dampers on outlet from cabinet and ceiling exhauster fans and as indicated.

END OF SECTION

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PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Diffusers:
 - 1. Rectangular ceiling diffusers.
- B. Registers/grilles:
 - 1. Ceiling-mounted, egg crate exhaust and return register/grilles.
 - 2. Ceiling-mounted, supply register/grilles.
 - 3. Wall-mounted, exhaust and return register/grilles.

1.02 SUBMITTALS

- A. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

PART 2 PRODUCTS

2.01 RECTANGULAR CEILING DIFFUSERS

- A. Type: Provide square formed Plaque ceiling diffusers constructed to maintain 360 degree discharge air pattern with sectorizing baffles where indicated.
- B. Where diffuser is to provide One, Two or Three Way flows, Air Baffles to be utilized form diffuser manufacturer.
- C. Connections: Round.
- D. Frame: Provide surface mount, snap-in, inverted T-bar, and spline type. In plaster ceilings, provide plaster frame and ceiling frame.
- E. Fabrication: Steel with baked enamel finish.
- F. Color: As indicated.
- G. Accessories: Provide butterfly volume control damper; removable core, sectorizing baffle, operating rod extension, and anti-smudging device with damper adjustable from diffuser face.

2.02 CEILING EGG CRATE EXHAUST AND RETURN GRILLES

- A. Type: Egg crate style face consisting of 1/2 by 1/2 by 1/2 inch grid core.
- B. Fabrication: Grid core consists of aluminum with mill aluminum finish.
- C. Color: White
- D. Frame: Channel lay-in frame for suspended grid ceilings.

2.03 WALL EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with spring or other device to set blades, vertical face.
- B. Frame: 1-1/4 inch margin with countersunk screw mounting.
- C. Fabrication: Steel frames and blades, with factory baked enamel finish.
- D. Color: White.
- E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

- B. Comply with SMACNA (ASMM) for flashing/counter-flashing of roof penetrations and supports for roof curbs and roof mounted equipment.
- C. Check location of outlets and inlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.
- D. Install diffusers to ductwork with air tight connection.
- E. Provide balancing dampers on duct take-off to diffusers and grilles and registers, despite whether dampers are specified as part of diffuser, or grille and register assembly.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cooking hoods.

1.02 REFERENCE STANDARDS

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.
- B. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; 2024.
- C. SMACNA (KVS) - Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines; 2001.
- D. UL 710 - Standard for Exhaust Hoods for Commercial Cooking Equipment; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation instructions, adjusting and balancing methods.

PART 2 PRODUCTS

2.01 HOOD CONSTRUCTION

- A. Provide products that comply with NFPA 96, the requirements and recommendations of SMACNA (KVS), and the requirements of the Authorities Having Jurisdiction.
- B. Cooking Hoods: Provide Type I hoods, with all external joints and seams continuously welded, liquid-tight, and all internal joints, seams, and attachments sealed liquid-tight and grease-tight.
 - 1. Provide fire extinguishing system for all cooking hoods.
 - 2. Provide complete assemblies listed and labeled by UL under UL 710 for its intended use.
- C. Construction: Materials, inside and out, are stainless steel complying with ASTM A666, Type 304, stretcher leveled; unless otherwise indicated.
 - 1. Sheet Thickness: 18 gauge, 0.048 inch, minimum.
 - 2. Fabrication: Fabricate each individual hood in one piece, with all welds ground and finished to match (inside and out); fabricate flat surfaces exposed to view as double-pan formed panels with internal stiffener members.
 - 3. Finish on Surfaces Exposed to View: No.4 (brushed directional); provide stainless steel faces on all sides exposed to view.
 - 4. Finish on Concealed Surfaces: No.4 or No.2B (dull, matte).
 - 5. Duct Collars: For exhaust and make-up air openings, provide duct collar welded to hood unit; minimum of 8 inches extension from top or back face of unit, with minimum one inch 90 degree flange, unless otherwise indicated.
 - 6. Access Panels: Provide removable or hinged access panels sufficient for maintenance and replacement of operating components inside unit; maximum width of 40 inches.
 - 7. Supports: Stainless steel mounting brackets, struts, and threaded hanger rods.
 - a. Hanger Rods: 3/8 inch diameter, minimum.
 - b. Hanger Spacing: 48 inches on center, maximum.
 - c. Attachment to Structure: Mechanical fittings or inserts, stainless steel.

2.02 RESIDENTIAL RANGE (FIRE READY HOOD) SYSTEM

- A. Kitchen ventilation hood shall be exhaust only and cover a domestic range (sizes 30" or 36") in commercial environments used for domestic purposes only. The hood shall be ICC evaluated

and certified as compliant with International Mechanical Code (IMC), International Fire Code (IFC), and Uniform Mechanical Code (UMC). If provided with a fan, the fan shall be UL 507 listed or equivalent. Hood fire suppression shall be UL listed to the UL Subject 300A. Hood shall be configured as wall style (supplied with wall mounting bracket). The hood shall be constructed by Greenheck. The hood manufacturer shall provide, on request, the necessary data that confirms compliance with the code authorities listed above

- B. Hood shall be constructed of 18 gauge minimum, 300 series stainless steel outer shell. Hood shall be either 30" long (to cover 30" range) or 36" long (to cover 36" range). Hood shell shall be manufactured and assembled with no visible outer welds or weld marks. All internal seams shall be sealed with NSF-approved caulk, standard. A metal mesh filter shall be provided. Two (2) 2200-2700K color LED recessed hood lights shall provide over 50 foot-candles of evenly-dispersed lighting on the range below.
- C. Hood shall include factory-installed UL Subject 300A fire suppression system, including fully monitored electronic detection and actuation. No braided cable or fusible links shall be accepted. Fire suppression shall consist of two (2) mounted metal-housed temperature sensors that monitor the cooking surface and upon reaching set-point, send a signal back to the main fire system control board, which activates the tank solenoid valve and expels the wet chemical from a pre-charged tank responsible for suppressing the fire. Tank pressure shall be monitored using tank pressure sensor and a fault must be displayed on the user interface if low pressure is detected.
- D. All fire suppression and control components must be easily accessible by dropping the hood into a service position to allow for service without removing the hood. Latches shall be utilized to hold the hood into place for normal operation. No thumb screws or removable hardware are acceptable.
- E. Hood system shall include either an electronic or gas shut off device that shall be field connected back to the hood via factory-provided plug and play cables. Prior to fire suppression release, the shut off device shall be responsible for disabling the range upon detecting a high temperature.
- F. Gas disconnect (if provided) shall include a ¾" gas valve supplied with plug and play cable and a 115VAC control receptacle.
- G. Electric disconnect (if provided) shall include a 4-prong 250VAC 50A power receptacle. Other electric disconnect receptacle types are also available upon special request.
- H. Hood system with option for NFPA 101 compliance, must include: 500 CFM fan, locked (password protected) appliance disconnect with timed-automatic range deactivation, and manual pull station.
- I. User interface shall be provided to control fan, range, and lights and view system statuses, including faults/alarms. User interface shall be full color 4.3" LCD touch screen. No toggle switches or rheostats shall be acceptable. All factory and configuration settings must be accessed by touchscreen through password-protected entry. For ADA compliance, the user interface can be shipped loose to be field mounted on a wall near the hood. If shipped loose, user interface shall be provided with factory supplied plug and play cable.
- J. The hood system shall be configured as with either a factory-supplied integral fan, factory-supplied external fan, or fan by others. Integral fan options include either front recirculating or rear discharge. Front recirculating style shall include an easily accessible charcoal filter and opening in the front of the hood for filtering the exhaust air before discharging back into the space. Rear discharge shall direct the air to exit the back of the hood, to discharge through a wall to the outside. External fan options include either a factory-provided inline fan (with plug and play cable) or fan by others option with a top discharge hood configuration. Top discharge shall direct the air to exit the top of the hood, to discharge through a roof or wall to the outside. All factory provided fan options shall include energy efficient electrically commutated motors (ECM) standard.
- K. Basic hood operation shall be as follows:

1. User interface can be utilized to turn on and off fans, lights, and range disconnect.
 2. If configured for NFPA 101 life safety code, password entry will be required to engage disconnect. After range is turned on, count down timer will begin, and upon expiring will disengage the range disconnect.
 3. Upon reaching specific set-point, exhaust fan will engage automatically if not already turned on and be forced to a speed based on a temperature range.
 4. Upon reaching a second higher temperature set-point, the disconnect will be automatically shut off and a warning will appear on the user interface.
 5. Upon reaching a preset temperature, the fire system will engage and discharge wet chemical on top of the range.
- L. The system can also include the following options:
1. Enclosure panels to close-off the space above the hood to the ceiling (option for external fan configuration)
 2. Finished top, when no overhead cabinets are enclosing the top of the hood (option for internal fan configuration)
 3. Wall cap (option for rear discharge fan configuration)
 4. Horn strobe, with plug and play cable
 5. K-class 6 liter wet chemical fire extinguisher
 6. Manual pull station, with plug and play cable (included automatically with NFPA 101 compliance)
- M. Dry contacts are provided standard for tie into building alarm systems and supply fan integration.

2.03 WALL SUPPORT FOR KITCHEN HOOD

- A. Wall support wall section is to be utilized for mounting the kitchen hood. All workmanship to be neat with no imperfections of the Stainless-Steel covering. The kitchen hood specified to be mounted to the wall section per the detail. Mounting information to the wall per the hood manufacturer instructions.
- B. Wall support for Kitchen hood to be a fabricated wall section as shown on drawings. Framing materials such as 18-gauge metal studs, gypsum backer wall board to be per Specification Division 05 and 09.
- C. Contractor to attach framing and supports to existing structure and drop below ceiling as per the detail. Wall section to be anchored so there is no movement when hood is installed.
- D. Mounting of hood above finished floor to be 70 inches.
- E. All penetrations of ceiling and corner pieces to be finished with stainless steel flange material to produce a finished product.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that overhead supports are installed in correct locations.
- B. Do not begin installation until substrates have been properly prepared.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions and NFPA 96.
- B. Install hoods level and plumb, securely fastened, with seismic restraints as specified, and free of vibration during normal operation.
- C. Weld hood duct collars to ductwork, liquid-tight.
- D. Connect to utilities.

3.03 SYSTEM STARTUP

- A. Obtain the services of the manufacturer's representative experienced in the installation, adjustment, and operation of the equipment to supervise the starting and adjusting of equipment.
- B. Prepare equipment for startup, start and operate equipment for sufficient period to verify proper operation; correct equipment not operating correctly.
- C. Demonstrate operation to Owner's designated personnel.
- D. Report deficiencies in writing to Architect.

3.04 CLEANING

- A. Clean surfaces of equipment.

3.05 PROTECTION

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

END OF SECTION

Small-Capacity Split-System Air Conditioners**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Air-source heat pumps.
- B. Air cooled condensing units.
- C. Indoor air handling (fan and coil) units for ducted systems.
- D. Controls.

1.02 REFERENCE STANDARDS

- A. AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2023.
- B. AHRI 520 - Performance Rating of Positive Displacement Condensing Units; 2004.
- C. ASHRAE Std 23 - Methods for Performance Testing Positive Displacement Refrigerant Compressors and Compressor Units; 2022.
- D. NEMA MG 1 - Motors and Generators; 2021.
- E. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2018.
- F. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2024.
- G. UL 207 - Standard for Refrigerant-Containing Components and Accessories, Nonelectrical; Current Edition, Including All Revisions.

PART 2 PRODUCTS**2.01 SYSTEM DESIGN**

- A. Split-System Heating and Cooling Units: Self-contained, packaged, matched factory-engineered and assembled, pre-wired indoor and outdoor units; UL listed.
 - 1. Heating and Cooling: Air-source electric heat pump located in outdoor unit with evaporator; auxiliary electric heat.
 - 2. Provide refrigerant lines internal to units and between indoor and outdoor units, factory cleaned, dried, pressurized and sealed, with insulated suction line.
- B. Performance Requirements: See Drawings for additional requirements.
- C. Electrical Characteristics: Refer to drawings
- D. Disconnect Switch: Factory mount disconnect switch on equipment.

2.02 INDOOR AIR HANDLING UNITS FOR DUCTED SYSTEMS

- A. Indoor Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heating and cooling element(s), controls, and accessories; wired for single power connection with control transformer.
 - 1. Air Flow Configuration: Horizontal.
 - 2. Cabinet: Steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner.
- B. Supply Fan: Centrifugal type rubber mounted with direct or belt drive with adjustable variable pitch motor pulley.
 - 1. Motor: NEMA MG 1; 1750 rpm single speed, permanently lubricated, hinge mounted.
 - 2. Motor Electrical Characteristics:
- C. Air Filters: 1 inch thick glass fiber, disposable type arranged for easy replacement.
- D. Evaporator Coils: Copper tube aluminum fin assembly, galvanized or polymer drain pan sloped in all directions to drain, drain connection, refrigerant piping connections, restricted distributor or thermostatic expansion valve.

1. Construction and Ratings: In accordance with AHRI 210/240 and UL 207.
2. Manufacturers: System manufacturer.

2.03 OUTDOOR UNITS

- A. Outdoor Units: Self-contained, packaged, pre-wired unit consisting of cabinet, with compressor and condenser.
 1. Construction and Ratings: In accordance with AHRI 210/240 with testing in accordance with ASHRAE Std 23 and UL 207.
- B. Air Cooled Condenser: Aluminum fin and copper tube coil, AHRI 520 with direct drive axial propeller fan resiliently mounted, galvanized fan guard.
- C. Accessories: Filter drier, high-pressure switch (manual reset), low pressure switch (automatic reset), service valves and gauge ports, thermometer well (in liquid line).
 1. Provide thermostatic expansion valves.
- D. Operating Controls:
 1. Control by room thermostat to maintain room temperature setting.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrates are ready for installation of units and openings are as indicated on shop drawings.
- B. Verify that proper power supply is available and in correct location.
- C. Verify that proper fuel supply is available for connection.

3.02 INSTALLATION

- A. Install in accordance with NFPA 90A and NFPA 90B.

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL

- A. All work shall conform to the latest editions of the National Electrical Code (NEC) [National Fire Protection Association (NFPA) 70], the Standard for Electrical Safety in the Workplace (NFPA 70E), the Life-Safety Code (NFPA 101), the International Building Code, the Americans with Disabilities Act, and all other applicable federal, state, and local codes and regulations.
- B. All work shall be performed in strict compliance with NFPA 70E. Submission of bid shall stand as an agreement by the Contractor to indemnify and hold harmless the Engineer and Owner from all liability related to damage and/or injury to personnel and equipment during the installation of the project.
- C. The contract documents are schematic in nature and are intended to convey the intent of the electrical work to be performed on this project. Provide all material, labor, equipment, etc., necessary to provide complete and operable electrical systems.
- D. The General Conditions, Supplementary Conditions, General Requirements, Information to Bidders, and all other parts of this set of Contract Documents are hereby adopted and are applicable to the Division 260000 Contractor.

1.2 SCOPE OF WORK

- A. Visit site prior to bid. Devise a plan for installation of complete and operable electrical systems meeting the requirements and intent of the Contract Documents. Submission of Bid stands as evidence that the Contractor accepts the Contract Documents as sufficient and complete for the work to be performed. Notify the engineer at least two weeks prior to bid of any discrepancies between the Contract Documents and actual field conditions. No change orders will be granted due to existing conditions that could have been observed during a site visit.
- B. Provide temporary power and lighting during construction. Coordinate with the General Contractor for the exact requirements.
- C. Electrical switchgear and panelboard layouts are based on sizes of Square D equipment. Equipment manufactured by General Electric, Siemens, and Cutler Hammer are equally acceptable. However, the Electrical Contractor is responsible for selecting and furnishing gear that will fit in the spaces provided and shall be responsible for arranging the gear to meet the required code clearances. Regardless of the manufacturer, the Electrical Contractor shall provide a drawn-to-scale electrical layout with the equipment brochures for all rooms in which panelboards, motor control centers, switchboards, or switchgear are placed. The drawings shall include the work of all other trades including mechanical system piping, ductwork, sprinkler piping, etc. No conduits shall be installed until layouts have been approved.
- D. Locate junction boxes, pull boxes, disconnects, and other equipment requiring access in such a manner that they are accessible at the end of construction. Notify the Architect where it is impossible to plan conduit routing or equipment placement in such a manner, and provide the necessary access panels in the ceiling or wall as required. The access panel type and style shall be subject to the Architect's approval. Employ a painter to provide the appropriate coatings as directed by the Architect.

- E. Relocate, or recircuit, all electrical equipment, conduit, and circuitry conflicting with or obstructing work on this project. Where the electrical systems are owned by other entities, pay them to relocate, or recircuit, their facilities.
- F. Arrange for connection of service to all electrical systems by the appropriate utility company. Coordinate completely with all utility company requirements even if they are different than the contract documents. If utility company requirements are different from the contract documents, notify the engineer at least ten days prior to bid. Pay all utility company charges necessary for installation and connection of service. If the cost of the service is unavailable at the time of bid, submit a letter to the General Contractor, signed by the appropriate utility company official, stating that the cost has not been determined. The General Contractor shall submit this letter with his bid. The cost will then become the Owner's responsibility.
- G. Provide all necessary equipment, raceway, circuitry, fittings, lugs, terminations, labor, etc. and connect to all equipment and appliances requiring electrical connections furnished herein, by the Owner, or by other Contractors. Prior to ordering electrical equipment and roughing in for equipment furnished by the Owner or other Contractors, verify all connection types, connection locations, connection heights, voltages, number of phases, conductor sizes, disconnecting means, breaker sizes, etc. Furnish the proper electrical equipment for the equipment actually being supplied.

1.3 SUBMITTALS AND SHOP DRAWINGS

- A. Within 30 days after award of Contract and prior to beginning work, provide six bound copies of manufacturers' cut sheets containing information concerning each article of electrical equipment to be furnished on this project. These cut sheets shall contain sufficient information to prove compliance with the contract documents. Information addressing the requirements of the contract documents shall be highlighted. Each bound set shall bear the stamp of the Electrical Contractor as well as the General Contractor.
- B. Within 30 days after award of Contract and prior to beginning work, provide six sets of full size shop drawings showing exact equipment locations with all equipment drawn to scale. Show all raceways with their junction boxes and pull boxes. Show all connection types, locations, and heights to equipment. Provide mounting and support details for all raceways and equipment. Coordinate with all other trades to ensure that there are no conflicts between systems. Each set of shop drawings shall bear the stamp of the Electrical Contractor, the General Contractor, and all Project Sub-Contractors. Failure to submit these Shop Drawings will render the Electrical Contractor responsible for resolving all conflicts between trades at his own expense.
- C. Submittals and Shop Drawings are reviewed to determine quality of materials. Approval of submittals and shop drawings does not relieve the Contractor of meeting the requirements and intent of the Contract Documents.
- D. Outlet, light fixture, and device locations are shown in their approximate locations on the drawings. Coordinate with Architectural drawings to get final locations. Mount all electrical outlets shown at counters such that the bottom of the box is two inches above the backsplash or six inches above a counter with no backsplash. The Owner reserves the right to relocate outlets, light fixtures, and devices a distance not to exceed twenty feet prior to the installation of outlet boxes.

PART 2 - PRODUCTS

- 2.1 All electrical equipment and materials shall be new. All equipment and materials shall be stored on the job site in weatherproof enclosures. Electronic equipment shall be stored in facilities where the temperature and humidity are controlled. In addition, comply completely with all manufacturers' requirements for storage and handling.

- 2.2 All equipment shall be UL listed for the application in which it is used and shall be labeled as evidence of its UL listing.
- 2.1 Each branch circuit and multiwire branch circuit shall be run with its own neutral conductor complying with NEC article 200.4.

PART 3 – EXECUTION

3.1 WORKMANSHIP

All work shall be performed with an emphasis on neatness. The Engineer, Architect, and Owner retain the right to reject work that is, in their judgment, unsatisfactory.

3.2 EXPERIENCE

The Contractor shall have completed at least two jobs of similar size and scope within the past five years. The Engineer reserves the right to reject Contractors based on their inability to submit evidence of their experience, or based on experience with the Contractor on previous projects.

3.3 PERMITS

Obtain and pay for all permits required for work.

3.4 FIREPROOFING

- A. Fireproof all penetrations through firewalls with a fireproofing compound listed to maintain the rating of the wall through which the raceway passes.
- B. The firestopping caulk shall be a one-part, intumescent, latex elastomer. The caulk shall be capable of expanding a minimum of 3 times at 1000°F. The material shall be thixotropic and be applicable to overhead, vertical and horizontal firestops. The caulk shall be listed by independent test agencies such as UL or FM and be tested to, and pass the criteria of, ASTM E 814 Fire Test, tested under positive pressure. It shall comply with the requirements of the NEC (NFPA-70), BOCA, ICBO, SBCCI and NFPA Code 101. Firestopping caulk shall be paintable, but shall be non-hardening. Firestopping caulk shall be 3M Firebarrier CP or approved equal.
- C. The fireproofing materials shall be installed by individuals certified to perform such work. Submit evidence of personnel certifications with electrical equipment brochures.
- D. Where cable trays are shown crossing firewalls, terminate the cable tray on each side of the wall and run the conductors through conduits installed in the wall. Fireproof around the conductors after installation.
- E. Provide mineral wool packing and all other materials recommended by the manufacturer for a complete installation.

3.5 FLASHING

Provide all necessary equipment and flash all roof penetrations in such a manner to ensure that all penetrations are completely sealed and all roof warranties remain in effect. Where there are no roof warranties, the Electrical Contractor shall guarantee the electrical penetrations against leaking for a period of one year from project completion. Employ a professional roofing contractor to perform all flashing.

3.6 PROTECTION

- A. Keep energized equipment covered during all phases of construction. Use enclosures, doors, covers, etc., to ensure that neither personnel nor machinery contact live electrical equipment.
- B. Replace electrical equipment that is damaged during construction.

3.7 DAMAGED FACILITIES

Locate all existing site equipment and utilities prior to beginning construction. Repair all equipment and utilities damaged during construction, or pay for the repair of the equipment and utilities where required by the Owner of the damaged facilities.

3.8 EXCAVATION AND BACKFILL

- A. Excavate in such a manner as to minimize erosion of the soil. Backfill trenches around conduits with fine sand that is free of rocks, clods, and debris. Fill sand a minimum of 4" over conduits. Backfill the rest of the trench in six inch increments, wetted, and tamped. Final compaction shall be a minimum of 95% of that of the adjacent earth. Resurface the grade with the same material as that excavated from the grade whether it be paving, concrete, sod, etc. Repair work shall be comparable to the quality of the original site prior to excavation.
- B. Provide a 3" wide plastic labeled marker tape 12" below grade over all electrical conduits buried underground. Tapes for power circuits shall have a warning such as "Caution: Buried Electrical Line Below." Labels on tapes for telephone, data, cable television, and other facilities shall adequately describe the line over which they are buried.

3.9 IDENTIFICATION

- A. Label all switchboards, panelboards, motor starters, disconnects, and motor control centers furnished under Division 16000 and other divisions of this contract with engraved rigid plastic nameplates having letters at least ¼ inch high. Nameplates shall be bolted to the enclosure. All labels shall indicate the voltage, number of phases, the AIC rating, and the panelboard and circuit number from which the device is fed.
- B. All circuit breakers in Switchboards, Motor Control Centers, Square D I-Line, and similar panelboards shall be labeled with plastic nameplates (as described in Part A) providing the name of the load served and the ampacity and number of poles of the breaker.
- C. All Square D NQ, NF and similar panelboards shall have typewritten circuit directories.
- D. Label all conductors at all junction boxes, pull boxes, and terminations with typewritten adhesive markers indicating the panelboard or switchboard name and circuit number of the conductor. Labels shall be Brady Datab or approved equal.
- E. Label all junction boxes and pull boxes with stenciled painted letters containing the name of the panelboard and circuit numbers of the circuits contained within. Use black paint for normal circuits, red paint for emergency circuits, and orange paint for fire alarm circuits. The Contractor may select other colors for junction boxes and pull boxes for auxiliary systems.
- F. Label all conduits in the most likely direction of access and view every 50' and on both ends of each bend with stenciled painted letters containing the name of the panelboard and circuit numbers of the circuits contained within. Use black paint for normal circuits, red paint for emergency circuits, and orange paint for fire alarm circuits. The Contractor may select other colors for conduits for auxiliary systems.

3.10 AS-BUILT DRAWINGS

Maintain one set of drawings during construction for as-built markings. Mark these drawings in red to indicate field changes. Provide these drawings to the Engineer at the end of the construction process. Where required under the General Conditions, Special Conditions, or other portions of this contract, provide revised computer drawn as-built drawings to the Engineer at the end of construction.

3.11 TESTING

- A. A third party testing agency shall be employed as required to test all systems for compliance with the requirements of all regulatory agencies and these specifications. See the individual specifications and/or the electrical testing specification 26.4800 for requirements.
- B. Provide three bound copies of all test results to the Engineer at the end of the construction process. No Recommendation of Substantial Completion will be granted until all testing reports have been submitted.

3.12 WARRANTY

Provide the Owner a written guarantee to repair, or replace, all faulty equipment and systems for a period of one year from date of Substantial Completion. During this one-year period, a representative of the Contractor shall be on the site actively working on the repairs within 24 hours of the Owner's telephone call. During this period of time, the Owner shall not be charged for any repair work or expenses related with the repair work unless the Contractor can prove that the Owner has damaged the equipment or system.

END OF SECTION

WORK IN EXISTING FACILITIES**PART 1 – GENERAL**

1.1 GENERAL

- A. All work shall be scheduled and coordinated through the General Contractor with the Owner. Provide necessary costs for all work during both normal and premium work hours in bid.
- B. Provide continuous uninterrupted power to all existing facilities to remain during the entire construction process. Any required power outages must be scheduled and approved by the Owner in writing at least three days prior to the outage.

1.2 SCOPE OF WORK

- A. Prior to beginning work, survey existing electrical systems. Document, in writing, signed by the Owner any portions of existing systems that are not operating properly before construction begins. Any electrical systems found inoperable at the end of the construction process that has not been so documented shall be repaired at the end of construction.
- B. Remove electrical equipment in areas being demolished, and electrical equipment feeding other equipment being demolished. Remove raceways and circuitry back to the panel of origination. Where raceways are installed in inaccessible areas, remove conductors back to the panel of origination. Where circuits are not being completely demolished, remove conductors back to a junction box or other connection point outside of the renovated area and recircuit existing electrical equipment that is to remain as required. Where necessary, completely refeed existing electrical equipment that is to remain. It is the intent of this specification that all existing equipment to remain be left completely operable at the end of the construction process.
- C. Survey existing panelboard circuitry and provide new typewritten directories giving complete as-built circuitry information for all panelboards affected by the construction on this project.
- D. Where new circuit breakers are installed in existing equipment, the new circuit breakers shall be manufactured for installation in that equipment. The Amperes Interrupting Current (AIC) Rating shall equal the AIC rating of the existing equipment. A breaker with a lower AIC rating may be used if the contractor provides calculations showing that the breaker rating is sufficient to handle the available fault current. Submit these calculations for approval prior to ordering the breaker. An AIC rating on an existing breaker in the panelboard or switchboard does not demonstrate sufficient proof that the available fault current is less than that breaker's AIC rating.

PART 2 – PRODUCTS

- 2.1 Products shall be selected to maintain or improve the aesthetics of the facility. Gain approval of the Architect or Engineer prior to ordering or installing any electrical equipment or raceway.

PART 3 – EXECUTION

- 3.1 Coordinate the routing of all circuits and the locations of all devices with the Architect or Engineer and the Owner. Shop drawings shall describe completely the locations and elevations of all raceways, boxes, fittings, and equipment.

- 3.2 Where conduits and circuitry are shown concealed in existing walls, ceiling, or floors, employ professional tradesmen to perform cutting, patching, painting, and any other type of finishing required to match the surrounding surfaces. Submit the selected professional's qualifications to the Architect or Engineer for approval prior to beginning work.

END OF SECTION

LOW-VOLTAGE POWER CONDUCTORS AND CABLES

PART 1 – GENERAL

- 1.1 Provide all circuitry, terminations, splices, connectors, lugs, and other equipment necessary for connection of all equipment requiring electrical connections.
- 1.2 METAL CLAD CABLE.
 - A. Provide all circuitry, terminations, splices, connectors, lugs, and other equipment necessary for connection of metal clad cable where used on this project.
 - B. Metal Clad (MC) Cable may only be used where new electrical devices are being installed in existing hollow walls. All other circuitry shall be in conduit per Specification 260533.
 - C. Provide a junction box in the accessible ceiling above the location of the new outlet. Provide a hole in the wall above the accessible ceiling. At the proper outlet height, cut out a hole in the wall for the use of an after-construction box. Run MC Cable down the wall to the junction box in the crawlspace, and connect it to the after-construction box before installing the box in the wall.
 - D. Each MC cable shall be furnished with a green insulated copper ground wire that is not shown by tic marks on the drawings.

PART 2 – PRODUCTS

2.1 CONDUCTORS

- A. All electrical conductors shall be soft-drawn annealed copper having 98% conductivity and an insulation rating of 600V.
- B. Conductors shall be UL listed for installation in the raceway in which they are to be installed.
- C. Conductors shall be rated 90 degrees C for use in residential, commercial, industrial, and institutional facilities, and shall be listed as 105 degrees C appliance wire. Conductors shall be listed under UL 83, UL 1063, and UL 758. If XLP or EPR insulation is used, conductors shall be listed under UL 44 and NEMA WC7.
- D. Conductors used for branch circuits, feeders, auxiliary systems, and controls run in dry locations shall have PVC insulation and a Nylon outer jacket. They shall be THHN/THWN or XHHW-2.
- E. Conductors used for branch circuits, feeders, auxiliary systems, and controls run in wet locations shall have XLP or EPR insulation and be type XHHW-2.
- F. Conductors used for operating room isolation panels and associated branch circuits shall be copper stranded conductor having a cross-linked polyethylene insulation or equivalent with a dielectric constant of 3.5 or less. Wire-pulling compounds that increase the dielectric constant shall not be used on the secondary conductors of isolation panels. The isolated circuit conductors shall be identified as follows:

Isolated Circuit #1 – Orange

Isolated Circuit #2 – Brown

For 125 volt, 15 & 20 ampere receptacles: The orange conductor shall be connected to the terminal on the receptacle that is identified in accordance with NEC 200.10(B) for connection to the grounded circuit conductor.

G. Conductors used for services shall be type SE for aerial services or type USE-2 for underground services.

H. Sizes #10 and #12 shall be solid conductors except where used for controls. All controls conductors shall be stranded.

I. Use minimum #14 AWG conductors for controls and auxiliary circuits. Use larger conductors as required to compensate for voltage drops exceeding 3% of the system voltage.

J. Conductors shall be furnished in the colors described below unless local ordinances require different colors. Conductors #8 and smaller shall be furnished with colored insulation; conductors larger than #8 shall be taped with the appropriately colored tape for a length of at least 2" at each panelboard, junction box, pull box, load, or other exposed location. Ground conductors shall be taped green for their entire exposed length.

System Voltage	208Y/120V, 3-Phase, 4-Wire	120/240V, 3-Phase, 4-Wire	480Y/277V, 3-Phase, 4-Wire
Phase A	Black	Black	Brown
Phase B	Red	Orange	Orange
Phase C	Blue	Blue	Yellow
Neutral	White	White	Gray
Ground	Green	Green	Green

2.1 METAL CLAD CABLE

A. Shall be UL listed as type MC. It shall meet the requirements of UL 1569. It shall also be constructed in accordance with NEC 334 C.

B. Fittings shall be manufactured and UL listed for the application in which they are used.

C. MC cable shall have an interlocked armor made of aluminum alloy or galvanized steel.

D. All electrical conductors shall be soft-drawn annealed copper having 98% conductivity and an insulation rating of 600V.

E. Conductors shall have PVC insulation and a Nylon outer jacket. They shall be THHN/THWN or XHHW-2.

F. Sizes #10 and #12 shall be solid conductors. Other conductors shall be stranded.

G. Conductors shall be furnished in the colors described below unless local ordinances require different colors.

Conductors #8 and smaller shall be furnished with colored insulation; conductors larger than #8 shall be taped with the appropriately colored tape for a length of at least 2" at each panelboard, junction box, pull box, load, or other exposed location. Ground conductors shall be taped green for their entire exposed length.

System Voltage	208Y/120V, 3-Phase, 4-Wire	120/240V, 3-Phase, 4-Wire	480Y/277V, 3-Phase, 4-Wire
Phase A	Black	Black	Brown
Phase B	Red	Orange	Orange
Phase C	Blue	Blue	Yellow

Neutral	White	White	White
Ground	Green	Green	Green

PART 3 – EXECUTION

3.1 CONDUCTORS

- A. Install conductors carefully using a minimum of two tradesmen – one feeding the conductors into the conduit, and the other pulling the conductors into the conduit.
- B. **Each branch circuit and multiwire branch circuit shall be run with its own neutral conductor complying with NEC article 200.4.**
- C. Join stranded conductors with appropriate mechanical or compression lugs. Wire nuts may be used for solid conductors only.
- D. Splices shall only be made in approved enclosures. Splices shall not be pulled inside conduits.
- E. Provide cable supports and strain relief connectors as required by the NEC.
- F. Furnish junction boxes, pull boxes, handholes, manholes, etc. as required to ensure that the maximum number of bends allowed by the NEC are not exceeded and to ensure that the cables are not damaged during installation.

3.2 METAL CLAD CABLE EXECUTION

- A. Install MC Cable per the requirements of NEC 334 B.
- B. Join stranded conductors with appropriate mechanical or compression lugs. Wire nuts may be used for solid conductors only.
- C. Provide cable supports as required by the NEC.
- D. Furnish junction boxes, pull boxes, handholes, manholes, etc. as required to ensure that the maximum number of bends allowed by the NEC are not exceeded and to ensure that the cables are not damaged during installation. Do not enclose junction boxes in areas that will be inaccessible at the end of construction.
- E. MC Cable shall be run complete between junction boxes or outlet boxes. Splices are not allowed.

END OF SECTION

PART 1 - GENERAL

- 1.1 Furnish and install a complete system of Vacancy sensors as shown on the drawings and as specified herein to comply with IECC 2012. The drawings are provided to show the general scope of the work, and show the absolute minimum components required. Actual system components, quantities, and locations shall be determined by the motion detector vendor and provided to the Contractor with the installation shop drawings.
- 1.2 The Contractor and Sales Representatives are advised to take notice of specified component characteristics when attempting to select and propose substitutions. It is highly unlikely that substitutions on a one-for-one component basis will produce results that provide acceptable system performance.
- 1.3 Provide all power packs, hardware, software, devices, circuitry, and other components, material, and labor required to install, configure, and test the entire system to the satisfaction of the Architect, Owner, and Engineer.
- 1.4 Submit six sets of manufacturer's cut sheets describing completely all equipment, and six sets of shop drawings showing all circuitry including terminal-to-terminal connections.
- 1.5 The wiring diagrams on these drawings are based on our best interpretation of the manufacturer's data that was available at the time of design; however, they shall not be used for system installation and configuration. The controls equipment vendor is expected to be thoroughly knowledgeable of the equipment that is being proposed, and shall provide detailed shop drawings tailored for each circuit and lighting zone on the project. General manufacturer's data sheets shall not be acceptable. The shop drawings shall be suitable for the installing electrician to use for complete installation of the circuitry without referring to data sheets or installation manuals for connection of lighting control equipment. These requirements shall be followed whether the specified equipment, or products of other manufacturers, is provided.

PART 2 - PRODUCTS

- 2.1 Hallway Vacancy sensors: Vacancy sensors used in the hallways shall be passive infrared, ceiling-mounted units with a coverage of 6' x 130'. They shall be Sensor Switch HW13 WV BR or approved equal.
- 2.2 Wall mounted LED lighting controls shall be 0-10V dimmer/vacancy sensor type equal to Lutron MS-Z101-V-XX
- 2.3 Wall mounted lighting controls shall be dual technology (ultrasonice/passive infrared) dual relay vacancy sensor type equal to Lutron MS-B202-V-XX
- 2.4 Areas up to 500 Square Feet: Ceiling mounted Vacancy sensors used in areas up to 500 square feet shall be dual technology infrared and passive infrared, ceiling-mounted units with a 360 degree, 500 square foot coverage.
- 2.5 Power Packs: Power packs shall be of the same manufacturer as the Vacancy sensors. Each shall be capable of controlling a 20 ampere circuit. They shall be rated for operation at the voltage of the system on which they will be used.
- 2.6 Circuitry: Provide control circuitry as required by the manufacturer for optimum system operation, but no less than the following: Control cables shall be 3-conductor #22 AWG copper with an overall jacket. Adjust conductor sizes as required to overcome unacceptable voltage drop.

PART 3 - EXECUTION

- 3.1 Vacancy sensors shall be provided so that their coverage areas overlap and there are no dead zones in the rooms where persons may stand and not be detected.

- 3.2 Vacancy Sensors shall be set for “manual on/automatic off” operation.
- 3.3 All work shall be done by qualified system technicians.
- 3.4 Wiring, including control wiring, shall be in Raceways meeting Specification 260533.
- 3.5 Guarantee workmanship and material for a period of one year after final acceptance. During the warranty period, repair or replace faulty equipment at no cost to the Owner for labor, material, or expenses.
- 3.6 Upon completion of job, test entire system. After testing submit a certificate to the Architect stating verification of the following:

PART 4 – CLOSE-OUT DOCUMENTS

- 4.1 Provide the following documents to the Architect for delivery to the Owner at the time of substantial completion:
 - A. Written Guarantee
 - B. Two sets of data prepared by the manufacturer for each item of electrical equipment completely describing each piece of equipment. The data shall include parts lists, a description of operation, shop drawings, wiring diagrams, maintenance procedures, and other literature required for operation and maintenance of equipment.
- 4.2 Instruct the Owner on system operational procedures. Notify the Owner and Architect at least one week in advance of the training session. Provide written step-by-step instructional material.
- 4.3 Notify the General Contractor that you are to present during the Pre-final Inspection. During that inspection, demonstrate all system functionality and capabilities; remove cover plates and panels covers as required to show the quality of the installation. The Owner, Architect, and Engineer reserve the right to reject unsuitable workmanship or performance.

END OF SECTION

PART 1 – GENERAL

1.1 GENERAL

All electrical systems circuitry shall be contained in raceways unless expressly listed in the specification for that system.

1.2 SCOPE OF WORK

- A. Provide all raceways, fittings, couplings, anchors, supports, hangers, etc. for complete raceway systems.
- B. Except for fire alarm conduit and factory-installed whips on light fixtures, a minimum of 3/4" conduit shall be used for all electrical raceways.
- C. Use Schedule 40 polyvinyl chloride (PVC) conduit for circuits allowed to be run underground and in slabs on grade level. Provide PVC-coated galvanized rigid steel elbows and PVC-coated galvanized rigid steel conduit for all vertical runs extending to a point at least 6" above grade. Galvanized Rigid steel conduit coated with two complete coats of asphaltum or bituminous paint may be used in lieu of PVC-coated galvanized rigid steel conduit.
- D. Use Galvanized Rigid Steel (GRS) conduit for all applications where circuits are run above ground and exposed to the weather.
- E. Use Electrical Metallic Tubing (EMT) for all branch circuits and feeders that are run in dry locations and in slabs above grade level.

PART 2 – PRODUCTS

- 2.1 PVC conduits, fittings, couplings, adapters, and accessories shall be UL listed and approved for use with 90 degree Celsius conductors. The UL label shall be affixed to each ten foot length of conduit and each fitting. Conduits shall comply with NEMA Specification TC-2 and UL 651. Fittings shall comply with NEMA TC-3 and UL 514b.
- 2.2 PVC-coated conduits, fittings, couplings, adapters, and accessories shall be UL listed with PVC as the primary corrosion protection. They shall be hot dipped galvanized rigid steel conduit with threads electro-galvanized after cutting. The conduit shall meet UL 6. The fittings shall meet UL 514B. The PVC coating shall be uniformly applied to the interior and exterior of all conduit and fittings. The coating shall be nominally 2 mils thick. The PVC coating shall extend one pipe diameter or two inches, whichever is less, at every male fitting except unions to fit over the joining female connection. Couplings shall contain a series of longitudinal ribs, 40 mils in thickness, to protect the coating from damage by tools during installation. PVC-coated conduits shall be ETL Verified PVC-001. Fittings shall be manufactured to the same standard. PVC-coated conduit shall be Robroy Plastibond or approved equal.
- 2.3 GRS conduits, fittings, couplings, adapters, and accessories shall be UL listed. They shall be hot-dipped galvanized steel. They shall meet the safety standards of UL 6, and shall be manufactured to ANSI C80.1. Threads shall be hot galvanized after cutting.
- 2.4 EMT conduits, fittings, couplings, adapters, and accessories shall be UL listed. They shall be hot galvanized steel and shall be produced in accordance with UL 797 and ANSI C80.3. The inside shall be finished with a corrosion-resistant lubricating coating.

- 2.5 Conduit fittings used with EMT conduits may be set screw indenter type or compression type. All metallic fittings for IMC and Rigid conduit shall be compression type fittings.
- 2.6 Flexible metallic conduit shall be constructed of galvanized steel and shall be UL listed as compliant with UL 1 and UL 1479.
- 2.7 Liquidtight flexible conduit shall be constructed of galvanized steel and shall be coated with a PVC jacket to resist liquids, dirt, grease, and oils. All fittings shall be designed, constructed, and installed to maintain the integrity of the liquidtight connections. Liquidtight flexible conduit shall comply with UL 360.

PART 3 – EXECUTION

- 3.1 Conduits run underground shall be buried no less than 24" deep. Services, conduits for primary conductors, and conduits run under roadways shall be buried no less than 48" deep.
- 3.2 Do not install conduits in or below ground floor slabs, except for service conduits, site lighting, and where specifically indicated on the drawings.**
- 3.3 Do not install conduits within 6" of the deck where a screw down type roof system is utilized.
- 3.4 PVC-coated conduits may be field-bent provided that manufacturer-approved tools are used. Individuals installing PVC-coated conduits shall be trained for installation by factory-certified trainers. Provide evidence of training with equipment brochures.
- 3.5 Support and install all conduits per the latest edition of the National Electrical Code. Support groups of conduits with electrical strut supported by threaded rods anchored to the building structure. Supports shall be designed to hold no less than twice the weight of the conduit and conductors to be supported plus an additional 250 pounds at midspan.
- 3.6 All conduits shall be grouped and run parallel to each other and to building walls.
- 3.7 All conduits shall be assembled according to the Manufacturer's instructions.
- 3.8 Conduits run underground shall be assembled to be watertight.
- 3.9 Cap all conduits during installation. Pull a mandrel sized for that conduit and a cleaning brush through each conduit before installation of any conductors.
- 3.10 Conduits that are obviously damaged and field bends that are obviously out of round shall be replaced.
- 3.11 Provide final connections to equipment with flexible metallic conduit. In wet or damp locations, use liquidtight flexible metallic conduit.
- 3.12 Terminate all 1" and smaller conduits entering boxes with a locknut inside the box and a locknut outside the box. Provide protective bushings on all 1" and smaller conduit threads. Use watertight hubs where conduit terminations are exposed to moisture.**
- 3.13 Use grounding bushings on all connections of 1-1/4" and larger conduits into outlet boxes, junction boxes, metallic enclosures, and panelboards. Grounding bushings shall also be used on all underground conduits and elsewhere required by the National Electrical Code.**

- 3.14 Conduits shall be run no closer than 12" to hot water pipes.
- 3.15 Where conduits are run through the ceiling and are required to make connections to equipment within the room that is not located near a wall, support the conduit from the structural ceiling and provide a flange bolted to the floor. Install a tee conduit fitting in the vertical run of conduit, and make the connection to the equipment with a piece of flexible conduit extending from the tee conduit fitting to the equipment.
- 3.16 Provide expansion fittings where conduits cross building expansion joints. Provide grounding jumpers between the conduits.**
- 3.17 Provide EMT conduit sleeves where conduits pass through walls, floors, or footings sized a minimum of two nominal trade sizes larger than the conduit that must pass through the sleeve.
- 3.1 Equip all empty conduits with a pullwire or string capable of withstanding 500 pounds of pulling tension.

END OF SECTION

OUTLET BOXES AND JUNCTION BOXES

PART 1 – GENERAL

- 1.1 Furnish and install all outlet boxes and junction boxes in accordance with this specification and the requirements of the NEC.
- 1.2 Provide outlet boxes for all switches, receptacles, luminaires, telephone jacks, cable jacks, and other devices furnished in this Contract. Provide all necessary hardware including, but not limited to, additional structural support, support brackets, screws, bolts, fixture studs, etc.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

Outlet boxes and junction boxes shall be manufactured by Raco, Steel City, Crouse Hinds, or Appleton.

2.2 GENERAL

- A. Concealed Outlet boxes and junction boxes in dry locations shall be galvanized stamped steel boxes sized per the latest edition of the National Electrical Code (NEC), but no less than 4" x 4" x 2 1/8" deep (Raco #231 or equal). The thickness of the steel shall be in compliance with the requirements of the NEC. Provide stamped steel covers for all junction boxes manufactured to fit the particular box on which it is used.
- A. Exposed Outlet boxes in dry locations shall be heavy duty, deep, die cast aluminum device boxes (Perfect Line "T" or "LT" series or approved equal) with appropriate coverplates.
- B. Outlet boxes used in concrete and masonry walls and ceilings shall be of the concrete type manufactured for such applications.
- C. Outlet boxes and junction boxes in wet locations shall be of cast metal construction with gasketed waterproof covers. All conduit connections to the boxes shall be made watertight.
- D. Wall outlet boxes shall be 4" x 4" x 2 1/8" (Raco #231 or equal), or larger as required, with plaster rings provided for final flush installation. Plaster rings shall have single-gang openings unless the equipment mounted inside requires two-gang installation.
- E. Floor boxes in slabs on grade shall be deep rectangular, cast iron, fully adjustable boxes with brass rings. Covers shall be made of brass and shall provide flip top access to the power or data jacks inside. Screw-on covers are not acceptable unless a flip-top cover is unavailable for the device installed in the floor box. Provide the box sized as required for the number of devices shown installed. Boxes shall be as follows, or approved equal:
 1. Single-Gang Boxes: Hubbell B2436
 2. Single-Gang Cover Plates: Hubbell S3825
 3. Double-Gang Boxes: Hubbell B4233
 4. Double-Gang Cover Plates: Two Hubbell S3825 Cover Plates
 5. Triple-Gang Boxes: Hubbell B4333
 6. Triple-Gang Cover Plates: Three Hubbell S3825 Cover Plates

In slabs above grade, use cast iron, semi-adjustable shallow boxes as follows, or approved equal:

1. Single-Gang Boxes: Hubbell B2414
2. Two-Gang Boxes: Hubbell B4214
3. Three-Gang Boxes: Hubbell B4314

Receptacles installed in floor boxes shall be as described in Specification 26 46 00, Switches and Receptacles. Data, Telephone, or Combination Data and Telephone Outlets shall consist of Category 5 rated RJ45 jacks mounted in a Hubbell DJOI strap for use under a S3825 flip top cover plate.

In existing slabs above grade, use poke thru boxes as follows, or equal:

1. Hubbell System One

F. Size all boxes per the requirements of the latest NEC.

PART 3 – EXECUTION

- 3.1 All devices shall be flush mounted unless specific written permission is obtained from the Engineer for a particular device in a particular location.
- 3.2 Install outlet boxes in walls, and provide plaster rings such that wall finish contractor's finish is flush against the edge of the plaster ring. Workmanship will not be accepted where the hole in the wall shows behind the cover plate, or the wall finish is uneven or unpainted at the edge of the cover plate.
- 3.3 Use round or square ceiling outlet boxes as required for the device being installed. The ceiling shall be finished flush against the box; the fixture shall completely cover the box and mount tight against the ceiling. Coordinate the requirements of the fixture prior to installing the box.
- 3.4 Provide junction boxes, pull boxes, and conduit fittings where required by the NEC to limit the number of bends in the raceway, and where required to prevent damage to conductors due to long runs.
- 3.5 Junction boxes and pull boxes installed in the ground outside shall be Quazite Composolite or approved equal. Mount the boxes over 24" of washed gravel fill. If splices are to be made inside the boxes, the boxes shall be of the type furnished with a bottom, and all conduit connections shall be watertight. In addition, all conductor splices shall be made watertight using an appropriate splice kit as manufactured by 3M, or an approved equal.

END OF SECTION

PART 1 – GENERAL

- 1.1 Ground all equipment, systems, structures, etc., per the latest edition of the National Electrical Code (NEC). **The overall, installed grounding electrode system shall have a resistance to earth of 5 ohms or less.**

PART 2 – PRODUCTS

- 2.1 Use mechanical bolted connections in dry locations that are accessible.
- 2.2 Use exothermic welds in wet locations and locations that will be inaccessible at the end of construction.
- 2.3 Ground rods shall be UL listed 3/4" x 10' copper-clad steel ground rods with a minimum copper cladding thickness of 10 mils.
- 2.4 All above grade grounding conductors shall have Type THW insulation, or equivalent, with green insulation.
- 2.5 All below grade grounding electrode conductors shall be bare or shall be colored green for its entire exposed length.
- 2.6 All loadcenters, panelboards, switchboards, transformers, enclosed circuit breakers, disconnects, control cabinets, etc. shall be provided with factory installed ground bars suitable for the size and quantity of grounding conductors terminating or originating from the device.

PART 3 – EMBEDDED GROUNDING

- 3.1 All ground wire shall be soft or medium drawn Class B stranded copper with cable size and insulation as shown on the drawings.
- 3.2 The minimum size conductor to be used on main grounding circuits shall be #2/0 AWG. The minimum size conductor to be used on any part of the embedded grounding system shall be #6 AWG.
- 3.3 All underground connections shall be made using an exothermic welding process.
- 3.4 At the point of attachment of all grounding connections, the surface shall be cleaned of all paint, oil, and grease and shall be dressed to bright metal to insure electrical continuity.
- 3.5 The minimum allowable depth of ground cable below permanent grade is 30 inches unless noted otherwise.
- 3.6 Where underground conductors are brought above grade, each conductor shall be enclosed in Sch. 40 PVC conduit and appropriately secured.
- 3.7 All completed grounding connections shall be cleaned and coated with insulating paint.
- 3.8 All new ground grids shall be connected to any existing nearby ground grids and to the ground conductors in any duct banks that terminate within the ground grid.

PART 4 – EXECUTION

- 4.1 Ground rods shall be installed with their tops no less than 12' below grade. Provide supplemental ground rods (in addition to the number of ground rods shown on the grounding detail), as required, to bring the overall resistance to earth to 5 ohms or less. Supplemental ground rods shall be installed a minimum of 8' apart.
- 4.2 Bond ground connections to metal raceways at each end of the conduit run. Provide grounding bushings where required by the NEC. Where cable trays are used, bond the ground conductor to each section and fitting of the tray.
- 4.3 Foundation reinforcing bars shall be bonded to the ground grid using a connector UL listed for the application.
- 4.4 Bond the secondary neutral to ground on all step down transformers and all separately derived systems per NEC article 250.
- 4.5 Provide all circuits with an equipment grounding conductor sized per the NEC, or as shown on the drawings. Circuitry shown on drawings does not include the required equipment grounding conductor. The equipment grounding conductor shall be furnished with green insulation for conductors #8 AWG and smaller; where larger than #8, the equipment grounding conductor shall be taped green for its entire exposed length.
- 4.6 Individual ground conductors shall be installed in PVC conduit sized per the NEC.
- 4.7 Provide receptacles, luminaires, and other devices with a green conductor that bonds the receptacle grounding screw or pigtail, the outlet box grounding screw, and the equipment grounding conductor together.
- 4.8 All boxes, enclosures, and electrical equipment shall be bonded to ground with a ground conductor sized per NEC.
- 4.9 In health care facilities, where two or more different panelboards serve the same patient-care area, a #6 AWG insulated continuous copper conductor shall bond these different panelboards together.
- 4.10 Telephone, cable television, and other auxiliary systems shall be bonded to the electrical building service ground using a conductor no smaller than #1/0 AWG. See the exact grounding requirements in each system's specification.
- 4.11 All SPD's shall be bonded to ground per the Manufacturer's installation instructions and/or the latest edition of the National Electrical Code.

END OF SECTION

PART 1 – GENERAL

- 1.1 Furnish and install all panelboards, complete with their circuit breakers, phase buses, neutral buses, ground buses, structural supports, and other equipment necessary for complete systems.

PART 2 – PRODUCTS

2.1 GENERAL

- A. Panelboards shall be designed, manufactured, and tested to be in compliance with NEMA PB 1, UL 50, UL 67, UL 489, NFPA 70, and the ASTM.
- B. Circuit breakers shall be designed, manufactured, and tested to be in compliance with NEMA AB 1, UL 489, and Federal Specification W-C-375B/GEN.
- C. Panelboards shall be UL listed for service entrance where used for that purpose.
- D. Panelboard ampere interrupting current (AIC) ratings shall equal the lowest rated device in the panelboard. Provide panelboards with the AIC ratings shown on the Contract Drawings. Buses shall be braced to withstand the AIC rating shown on the drawings. Series ratings shall only be used where shown on the panelboard schedules.
- E. All panelboards shall be furnished with dead-front, door-in-door construction.
- F. All loadcenters and panelboards shall be provided with factory installed ground bars suitable for the size and quantity of grounding conductors terminating and/or originating from the panel.
- G. Lug locations shall be determined during the creation of shop drawings for proper arrangement with the raceway system.
- H. Buses shall be constructed of 98% conductivity copper or equivalently rated aluminum.
- I. Panelboard enclosures shall be NEMA 1 when they are to be mounted indoors, and NEMA 3R when they are to be mounted outdoors. Provide special enclosures where shown on the Contract Drawings.

2.2 ACCEPTABLE MANUFACTURERS

Panelboards shall be manufactured by Siemens, Square D, General Electric, or Eaton.

2.3 PANELBOARD CLASSES

- A. Power distribution panelboards shall be available with mains and branch devices up to 1200 amperes. AIC ratings shall be available up to 200,000 Amperes. Power distribution panelboards shall be equipped with a nameplate containing the appropriate system voltage, number of wires, and number of phases for the system on which they are installed.
- B. In 480Vac and less applications where a main breaker not exceeding 600 Amperes is required, the AIC rating does not exceed 65,000 Amperes, and no branch breakers exceed 125Amperes, Square D NF and equivalent panelboards may be used.

- C. In 480Vac and less applications where a main breaker not exceeding 225 Amperes is required, the AIC rating does not exceed 14,000 Amperes, and no branch breakers exceed 100Amperes, Square D NEHB and equivalent panelboards may be used.
- D. In 240Vac and less applications where a main breaker not exceeding 400 Amperes or main lugs not exceeding 600 Amperes is required, the AIC rating does not exceed 22,000 Amperes, and no branch breakers exceed 125 Amperes, Square D NQOD and equivalent panelboards may be used.

2.4 CIRCUIT BREAKERS

- A. All circuit breakers shall be thermal magnetic, molded-case type breakers with quick-make, quick-break contact action, unless noted to be furnished with electronic trip units.
- B. Thermal Magnetic type circuit breakers shall have thermal and magnetic tripping elements on each pole. Breakers with multiple poles shall have common tripping of all poles. Circuit breaker ampere ratings shall be stamped on the handle. Interrupting ratings of the circuit breakers shall be equivalent to the specified AIC rating of the panelboard. Breakers handles shall reside in a position between "ON" and "OFF" after a trip condition. Breakers shall be rated HACR when used for heating, air-conditioning, and refrigeration; HID when used with High Intensity Discharge fixtures; and shall be rated SWD when used for switching duty.
- C. Electronic Trip Units shall have the following features: long time pickup, long time delay, short time pickup, short time delay, and instantaneous settings.
- D. Circuit breaker sizes for motor loads are based on Square D recommendations for use of their breakers at the motor horsepower listed on the mechanical drawings. If equipment is used other than Square D, adjust breaker sizes per the manufacturer's recommendations.
- E. Circuit breakers with slash ratings, such as 120/240V or 480Y/277V, shall be used in solidly grounded systems where the nominal voltage of any conductor to ground does not exceed the lower of the two values of the breaker's voltage rating and the nominal voltage between any two conductors does not exceed the higher value of the circuit breaker's voltage rating.
- F. Circuit breakers with straight voltage ratings, such as 240V or 480V, shall be used in systems other than solidly grounded systems (Corner-Grounded Delta, Ungrounded, Impedance Grounded, etc.) where the nominal voltage between any two conductors does not exceed the circuit breaker's voltage rating. A two-pole circuit breaker shall not be used to protect a three-phase, Corner-Grounded Delta system unless the circuit breaker is marked 1 Φ -3 Φ .

PART 3 – EXECUTION

- 3.1 Install panelboards in complete compliance with all Manufacturers' installation instructions.
- 3.2 Install conductors neatly in panelboards. Group and tie-wrap circuits that share a common neutral.
- 3.3 All panelboards shall have typewritten circuit directories.
- 3.4 Number circuits exactly as shown on the contract drawings.
- 3.5 Panelboards shall be labeled with a three line black phenolic nameplate with white core with 1/4" high letters. Nameplate shall identify panel and voltage, i.e., "Panel LA", "480Y/277V, 3 ϕ , 4W", "Fed from MDP".

- 3.6 Install Arc-Flash and Available Fault Current Labels on each Panelboard as detailed in the label detail in the construction drawings and in Specification 26 47 00.**
- 3.7 Any panels that are floor mounted shall be provided with a 4" thick concrete housekeeping pad that extends 3-1/2" around all edges of the panel. Provide 1", 45 degree chamfered edges.
- 3.8 Where panelboards are flush-mounted, provide one 3/4" spare conduit to above the accessible ceiling for every three available circuits not being used, but no less than two 3/4" spare conduits per panelboard.

END OF SECTION

DISCONNECTS AND SEPARATELY-MOUNTED CIRCUIT BREAKERS

PART 1 – GENERAL

- 1.1 Furnish and install all disconnects and separately mounted circuit breakers as shown on the drawings, specified herein, and required by the NEC.

PART 2 – PRODUCTS

2.1 GENERAL

- A. **Disconnects shall be of the heavy-duty type, and shall be UL listed for service entrance use.** They shall meet or exceed the requirements of NEMA Standard KS1. Provide fuses sized to appropriately protect the load served. Equipment manufacturer's recommendations shall take precedence over the Contract Drawings.
- B. Fuses shall be dual element, time-delay, Class J fuses. They shall be Bussman Low-Peak or approved equal.
- C. All disconnects and enclosed circuit breakers shall be provided with factory installed ground bars suitable for the size and quantity of grounding conductors terminating and/or originating from the device.
- D. Circuit breakers shall be thermal magnetic, molded-case with quick-make, quick-break contact action, unless noted otherwise. They shall have thermal and magnetic tripping elements on each pole. Breakers with multiple poles shall have common tripping of all poles. Circuit breaker ampere ratings shall be stamped on the handle. Interrupting ratings of the circuit breakers shall be equivalent to the specified AIC rating of the panelboard. Breakers handles shall reside in a position between "ON" and "OFF" after a trip condition. Breakers shall be rated HACR when used for heating, air-conditioning, and refrigeration; HID when used with High Intensity Discharge fixtures; and shall be rated SWD when used for switching duty.
- E. Circuit breaker sizes for motor loads are based on Square D recommendations for use of their breakers at the motor horsepower listed on the mechanical drawings. If equipment is used other than Square D, adjust breaker sizes per the manufacturer's recommendations.
- F. Circuit breakers with slash ratings, such as 120/240V or 480Y/277V, shall be used in solidly grounded systems where the nominal voltage of any conductor to ground does not exceed the lower of the two values of the breaker's voltage rating and the nominal voltage between any two conductors does not exceed the higher value of the circuit breaker's voltage rating.
- G. Circuit breakers with straight voltage ratings, such as 240V or 480V, shall be used in systems other than solidly grounded systems (Corner-Grounded Delta, Ungrounded, Impedance Grounded, etc.) where the nominal voltage between any two conductors does not exceed the circuit breaker's voltage rating. A two-pole circuit breaker shall not be used to protect a three-phase, Corner-Grounded Delta system unless the circuit breaker is marked 1 Φ -3 Φ .
- H. Disconnect and individually-mounted circuit breaker ampere interrupting current (AIC) ratings shall equal the rating of the panelboard from which they are fed unless otherwise noted.
- I. Buses shall be constructed of 98% conductivity copper or equivalently rated aluminum.
- J. Switches shall be horsepower rated where used to serve motors.

- K. Enclosures shall be NEMA 1 when they are to be mounted indoors, NEMA 3R when they are to be mounted outdoors, and NEMA 4X where they are subject to washdown. Provide special enclosures where shown on the Contract Drawings.

2.2 ACCEPTABLE MANUFACTURERS

Disconnects and separately-mounted circuit breakers shall be manufactured by Siemens, Square D, General Electric, or Cutler Hammer.

PART 3 – EXECUTION

- 3.1 Install disconnects and individually-mounted circuit breakers in complete compliance with all manufacturers' installation instructions. Where necessary, provide structural supports and bracing for installation.
- 3.2 Disconnects are to be surface-mounted.
- 3.3 Install Arc-Flash and Available Fault Current Labels on each Disconnect and Separately-Mounted Circuit Breaker as detailed in the label detail in the construction drawings and in Specification 26.4700.**
- 3.4 Individually-mounted circuit breakers are to be flush-mounted unless otherwise shown.

END OF SECTION

SECTION 26.4600
SWITCHES AND RECEPTACLES

PART 1 – GENERAL

Furnish and install all switches and receptacles in accordance with this specification and the requirements of the NEC.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

Switches and receptacles shall be manufactured by Hubbell, Cooper Wiring Devices, Leviton, or Pass & Seymour.

2.2 GENERAL

- A. Switches and receptacles shall be specification grade. They shall have ampacity and voltage ratings suitable for the application in which they are used.
- B. Consult Architect or Engineer for device colors prior to ordering devices.
- C. Provide brushed stainless steel cover plates for all devices. A single cover plate shall cover all devices in one box.
- D. Light switches shall be 20 Ampere, 120-277V back-wired and side-wired toggle switches. They shall be rated up to 2 HP at 240V. Each switch shall be equipped with a grounding screw. Switches shall be Hubbell CSB series or approved equal.
- E. Duplex NEMA 5-20R receptacles shall be Hubbell HBL 5362A or approved equal.
- F. Duplex GFI NEMA 5-20R receptacles shall be Hubbell HBL GF5362A or approved equal.
- G. Weatherproof while-in-use cover plates shall be Teddico #34017-7 or approved equal. Cover plates shall be single gang, lockable, and constructed of heavy duty die cast metal.
- H. All 125V, 15 and 20 ampere receptacles installed in dwelling units shall be of the tamper-resistant type.
- I. All 15 and 20 ampere, 125 and 250V non-locking receptacles installed in wet or damp locations shall be listed as the weather-resistant type.
- J. Devices furnished in this Contract, but not listed above, shall be of the same standard of quality as those items listed.

PART 3 – EXECUTION

- 3.1 Flush mount all devices unless specific written permission is obtained from the Engineer for a particular device in a particular location.
- 3.2 Install all devices vertically unless the drawings specifically state that the particular device should be mounted horizontally.

3.3 Install receptacles by utilizing pigtails. Do not install receptacles in a “feed thru” fashion.

3.4 Install receptacles with the ground slot up.

END OF SECTION

SURGE PROTECTIVE DEVICES (SPDs)

LOW VOLTAGE AC SURGE PROTECTION FOR ELECTRICAL DISTRIBUTION SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 RELATED WORK SPECIFIED ELSEWHERE:

- A. General electrical requirements.
- B. Raceways, boxes and fittings.
- C. Wire and cable.
- D. Low voltage motor control.
- E. Variable frequency drives.
- F. Grounding.
- G. Lightning protection systems.

1.3 DESCRIPTION

- A. Surge Protection Device (SPD) is the description and equipment required for the protection of all AC electrical circuits and electronic equipment from the effects of lightning induced voltages, external switching transients and internally generated switching transients.

1.4 REFERENCE STANDARDS AND PUBLICATIONS

- A. The latest edition of the following standards and publications shall comply to the work of this section:
 - 1. ANSI/IEEE C84.1-1989, American National Standard for Electric Power Systems and Equipment - Voltage Ratings (60 Hertz)
 - 2. ANSI/IEEE C62.41.1-2002, Guide on the Surge Environment in Low-Voltage AC Power Circuits
 - 3. ANSI/IEEE C62.41.2-2002, Recommended Practice on Characterization of Surges in Low-Voltage AC Power Circuits
 - 4. ANSI/IEEE C62.45-2002, IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits
 - 5. Underwriters Laboratories UL 1449 Third Edition, Standard for Safety – Surge Suppression Devices
 - 6. Underwriters Laboratories, UL 1283, Standard for Safety - Electromagnetic Interference Filters
 - 7. National Fire Protection Association, NFPA 780 - National Electrical Code

8. IEEE Standard 142-1991, IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems (IEEE Green Book)
9. ANSI/IEEE Standard 141-1999, IEEE Recommended Practice for Electric Power Distribution for Industrial Plants (IEEE Red Book)
10. IEEE Standard 1100-1999, IEEE Recommended Practice for Powering and Grounding Sensitive Electronic Equipment (IEEE Emerald Book)
11. FIPS Pub 94, Federal Information Processing Standards Publication - Guideline on Electrical Power for ADP Installations
12. National Electrical Manufacturer's Association LS-1, 1992 (NEMA LS-1)
13. MIL Standard 220A Method of Insertion-loss Measurement
14. ISO 9001:2000, Quality Systems - Model for Quality Assurance in Design, Development, Production, Installation and Servicing

1.5 MANUFACTURER QUALIFICATIONS

- A. All SPD devices shall comply with the construction drawings and specifications contained herein.
- B. The Manufacturer shall have a minimum of 10 years experience in manufacturing SPDs.
- C. The Manufacturer shall submit a written statement indicating that a factory authorized representative inspected the installation. The installing Contractor shall submit a checkout memorandum to the Manufacturer. The memorandum shall indicate the date the equipment is placed into service and the actual method of installation. Submit three copies to the specifying Engineer.

1.6 WARRANTY

- A. The SPD and supporting components shall be guaranteed by the Manufacturer to be free of defects in material and workmanship for a minimum period of 10 years from the date of substantial completion of service and activation of the system to which the suppressor is attached.
- B. An SPD that shows evidence of failure or incorrect operation during the warranty period shall be replaced free of charge. Since "Acts of Nature" or similar statements typically include the threat of lightning to which the SPD's shall be exposed, any such clause limiting warranty responsibility in the "General Conditions" section of this specification shall not apply to this section. The warranty shall cover the entire device.
- C. The installation of SPD's in or on electrical distribution equipment shall in no way compromise or violate equipment listing, labeling, or warranty of the distribution equipment.

1.7 SUBMITTALS

- A. The Surge Suppression Device submittals shall include, but shall not be limited to, the following information:
 1. Data for each suppressor type indicating conductor sizes, conductor types and connection configuration and lead lengths.
 2. Manufacturer's certified test data indicating the ability of the product to meet or exceed requirements of this specification.
 3. Suppressor Manufacturer shall provide certified test data confirming Short Circuit Current Rating (SCCR) of

the SPD(s).

4. UL 1449 clamp voltage documentation
5. Drawings, with dimensions, indicating SPD mounting arrangement and lead length configuration, and mounting arrangement of any optional remote diagnostic equipment and assemblies.
6. List and detail all protection systems such as fuses, disconnecting means and protective materials.
7. SPD wiring, bonding and grounding connections shall be indicated on the wiring diagrams for each system. Include installation details demonstrating mechanical and electrical connections to equipment to be protected.
8. If requested, a sample of each suppressor type shall be submitted for use in testing and evaluation.

PART 2 - PRODUCTS

2.0 Accepted Manufacturers

All Manufacturer's meeting these specifications and construction drawing requirements will be acceptable.

PERFORMANCE

A. GENERAL

1. SPD's shall be listed in accordance with UL 1449 Third Edition, Standard for Safety, Surge Protective Devices and UL 1283, Standard for Safety, Electromagnetic Interference Filters.
2. The SPD shall protect all modes:
 - a. A three-phase, four-wire plus ground (wye) voltage system shall have **ten** discrete suppression circuits: 3-modes (Line-to-Ground), 3-modes (Line-to-Line), 3-modes (Line-to-Neutral) and 1-mode (Neutral-to-Ground). Line-to-Neutral-to-Ground is not an acceptable substitute for Line-to-Ground.
 - b. A three-phase, 3-wire plus ground (delta) voltage system shall have six discrete modes of protection: 3-modes (Line-to-Neutral) and 3-modes (Line-to-Ground).
 - c. A three-phase, 4-wire plus ground (high-leg delta) voltage system shall have seven discrete modes of protection: 3-modes (Line-to-Ground), 3-modes (Line-to-Neutral) and 1-mode (Neutral-to-Ground).
3. **For new switchboards and panelboards, SPD's shall be integrally mounted inside the enclosures. For existing switchboards and panelboards, the SPD shall be mounted as close to the circuit breaker feeding it as possible. If remote mounted, the SPD shall not affect NEC code clearance of the electrical installation.**
4. **SPD's shall use a separate path to building ground; the equipment safety ground is not to be used as a transient ground path. The SPD's grounding conductor shall be bonded to the nearest appropriate grounding point using suitable lugs or connectors.**
5. SPD's shall have a SCCR of 200kA. Fuse ratings shall not be considered in lieu of demonstrated withstand testing of SPD, per NEC 285.6.

6. SPD shall be UL labeled with 20kA I-nominal (I-n) (verifiable at UL.com) for compliance to UL 96A Lightning Protection Master Label and NFPA 780.
7. The SPD circuit construction of the main surge current diversion path shall be MOV (metal-oxide varistors) based. The protection status of device shall be clearly monitored on the front panel of the SPD enclosure.
8. **Each SPD shall be provided with a protective disconnecting means in accordance with code requirements.**
 - a) **Where SPDs are being furnished for new panels, a 30A, 3-pole circuit breaker shall be installed in the panelboard to serve the SPD (adjust breaker size and wire size as required for other vendor's equipment).** .
 - b) **Where SPDs are being furnished for existing panels, a 30A, 3-pole circuit breaker shall be installed in the panelboard to serve the SPD (adjust breaker size and wire size as required for other vendor's equipment). Where there is no space in the existing panel, provide an SPD with integral disconnect switch, and provide the necessary hardware to connect the SPD to the panelboard bus.**
9. Suppressor shall have turn-on and turn-off times of less than one nanosecond.
10. SPD's shall be constructed using metal-oxide varistor (MOV) based suppression circuits. The SPD shall have a response time of less than one nanosecond with six inches or less of connected lead length for any individual protection mode.
11. The maximum continuous operating voltage (MCOV) of all components shall not be less than 125% for a 120V system and 115% for 220, 240, 277, and 480V systems.

B. SERVICE ENTRANCE PROTECTION

1. **Type 1 Devices:** The service entrance SPD equipment shall meet or exceed the minimum performance criteria as follows:
 - a. The single-impulse surge-current rating shall be a minimum of 240,000 Amperes per phase (120,000 Amperes per mode).
 - b. UL 1449 Third Edition Voltage Protection Rating for the following configurations shall not exceed the following:

Voltage Configuration	L-G	L-N	N-G
120/208V	700V	700V	700V
277/480V	1200V	1200V	1200V

- c. The SPD's pulse life when subjected to an ANSI/IEEE C62.41-1991, Category (20kV-1.2/50µs, 10kA-8/20µs) waveform shall survive a minimum of 10,000 hits or occurrences.
- d. Visual indication of proper SPD connection and operation shall be easily viewed on the front panel of the enclosure. The indicator lights shall indicate suppression circuit status, phase status, phase loss and suppression fault.
- e. Terminals shall be provided for all of the necessary power and ground connections. Each terminal shall accommodate wire sizes of #10 to #1 AWG.
- f. SPD's shall be provided with a set of normally-open/normally-closed Form "C" dry contacts for remote monitoring.
- g. SPD's enclosure type shall be rated NEMA 4.
- h. SPD's shall have a diagnostics LCD panel display providing information on phase loss (specific to each phase), percentage of protection for each phase, surge/transient event count, stored cumulative

surge/transient event history, technical support information and an audible alarm with a muting function.

C. DISTRIBUTION PANEL PROTECTION

1. **Type 2A Devices (Type 1 is acceptable):** The distribution panel SPD equipment shall meet or exceed the minimum performance criteria as follows:

- a. The single-impulse surge-current rating shall be a minimum of 120,000 Amperes per phase (60,000 Amperes per mode).
- b. The UL 1449 Third Edition Voltage Protection Rating for the following configurations shall not exceed the following:

Voltage Configuration	L-G	L-N	N-G
120/208V	700V	700V	700V
277/480V	1200V	1200V	1200V

- c. SPD's shall be of compact design. The mounting position of the SPD shall allow a straight and short lead-length connection between the SPD and the point of connection in the panel board.
- d. Visual indication of proper SPD connection and operation shall be easily viewed on the front panel of the enclosure. The indicator lights shall indicate suppression circuit status, phase status, phase loss, reduced protection level and suppression fault.
- e. A set of normally open/normally closed Form "C" dry contacts shall be provided for remote monitoring.
- f. The enclosure type shall have a NEMA 4 rating.

D. SUBPANEL PROTECTION

1. **Type 2B Devices (Type 1 is acceptable):** The subpanel SPD equipment shall meet or exceed the minimum performance criteria as follows:

- a. The single-impulse surge-current rating shall be a minimum of 48,000 Amperes per phase (25,000 Amperes per mode).
- b. The UL 1449 Third Edition Voltage Protection Rating or the following configurations shall not exceed the following:

Voltage Configuration	L-G	L-N	N-G
120/208V	700V	700V	700V

- c. Visual indication of proper SPD connection and operation shall be easily viewed on the front panel of the enclosure.
- d. A set of normally open/normally closed Form "C" dry contacts shall be provided for remote monitoring.
- e. The enclosure type shall have a NEMA 4 rating.

F. POINT-OF-USE SINGLE-PHASE (120 VAC) HARD-WIRED SUPPRESSORS

1. **Type 3 Devices (Type 1 is acceptable):** The subpanel SPD equipment shall meet or exceed the minimum performance criteria as follows:

- a. The single-impulse surge-current rating shall be a minimum of 40,000 Amperes per phase (20,000 Amperes per mode).

- b. A single-phase, two-wire plus ground voltage system shall have three discrete suppression circuits: 1-mode (Line-to-Ground), 1-mode (Line-to-Neutral) and 1-mode (Neutral-to-Ground). Line-to-Neutral-to-Ground is not an acceptable substitute for Line-to-Ground.
- c. Suppressors shall be listed in accordance with UL 1449 3RD Edition, Standard for Safety, Transient Voltage Surge Suppressors. The SPD's UL 1449 Third Edition Voltage Protection Rating shall not exceed 700 volts peak.
- d. The SPD's pulse life when subjected to an ANSI/IEEE C62.41-1991, Category B3/C1 (6 kV - 1.2/50 μ s, 3 kA - 8/20 μ s) waveform once every 30 seconds shall survive a minimum of 3000 hits or occurrences.
- e. Visual indication of proper connection and operation shall be provided conveniently on the enclosure of the SPD.
- f. SPD(s) shall provide fusing in such a manner that the power to the load is not interrupted.

PART 3 - EXECUTION

3.1 GENERAL

- A. The contractor shall follow the SPD Manufacturer's recommended installation practice as found in the equipment installation instructions.
- B. SPD's shall be of compact design. The mounting position of the SPD shall allow a straight and short lead-length connection between the SPD and the point of connection in the panelboard.
- C. The installing contractor shall install the parallel SPD with short and straight conductors as practically possible.
- D. Installer may reasonably rearrange breaker locations to ensure short and straightest possible leads to SPD's.
- E. The installation shall apply to all applicable codes.

3.2 SERVICE ENTRANCE PROTECTION

- A. Install one SPD at each utility service entrance location **whether indicated on the drawings or not.**
- B. The SPD's ground shall be bonded to the service entrance ground.
- C. Neutral and ground shall be bonded together at service entrance panel locations.

3.3 DISTRIBUTION PANEL PROTECTION

- A. Install one SPD at each utility distribution panel location **whether indicated on the drawings or not.**
- B. Neutral and ground shall not be bonded together inside any distribution panel location.

3.4 SUBPANEL PROTECTION

- A. Install one SPD at each utility subpanel location **where indicated on the drawings.**
- B. Neutral and ground shall not be bonded together inside any subpanel location.

3.4 ELECTRONIC EQUIPMENT AC POWER SUPPLY POINT-OF-USE (120VAC) HARD-WIRED PROTECTION

- A. Install one each point-of-use (120VAC) hard-wired SPD between each equipment item and its power supply conductors as follows:
 - a. Fire alarm master panel
 - b. Intercom master
 - c. Building energy management system master
 - d. Security system master
 - e. Telephone system switch
 - f. TV head end

- B. Install SPD's according to Manufacturer's installation instructions.

END OF SECTION

PART 1 – GENERAL

- 1.1 Provide all lighting fixtures (luminaires), lamps, end caps, connectors, fittings, structural support members, supports, brackets, etc., for a complete and operable lighting system.
- 1.2 Prior to submitting electrical equipment brochures for review and approval, coordinate with the General Contractor and verify that the fixtures are appropriate for the ceiling types in which they are shown to be installed. Also verify that ballast voltage on the submittals is appropriate for the electrical system on which the fixtures are to be installed (regardless of voltage listed in the part number in the Fixture Schedule). Submit with equipment brochures a certificate stating that these items of coordination have been completed.

PART 2 – PRODUCTS

2.1 LUMINAIRES

- A. Luminaires are shown in the Luminaire Schedule on the drawings to establish a standard of quality. Manufacturer's names and model numbers shall not be interpreted as a proprietary specification. Notify the engineer at least two weeks prior to bid if an equivalent for a fixture listed in the schedule is not readily available,
- B. Provide the appropriate lamps, trim types, lenses, and accessories for proper installation in the area shown on the drawing. Coordinate with the ceiling contractor during the creation of shop drawings to ensure that fixtures are appropriate for the type of ceiling being installed.

2.2 LAMPS

- A. Incandescent lamps shall be rated 125V and shall be of the appropriate size with the appropriate base configuration for installation in the fixture specified. Incandescent lamps shall be clear unless otherwise specified.
- B. T8 fluorescent lamps shall be rapid-start with a Color Rendering Index (CRI) of 75 and a color temperature of 3500K.
- C. T5 & T5HO fluorescent lamps shall be rapid-start with a Color Rendering Index (CRI) of 82 and a color temperature of 3500K.
- D. HID Lamps shall be clear unless otherwise noted. They shall have a color temperature of 3500K. Coordinate base size with fixture socket prior to ordering lamps.
- E. LED lamps shall be LM79 and LM80 tested.

2.3 BALLASTS

- A. Fluorescent luminaires shall be furnished with energy-saving, high power factor (0.9 or greater), electronic ballasts. Ballasts shall operate lamps without noticeable flicker and shall operate within the IES recommended noise levels. Ballasts shall operate at a frequency no less than 20,000 Hz. Total harmonic distortion shall be less than 10%. Ballasts shall be able to withstand voltage transients in accordance with IEEE C62.41, Category A for normal and common modes. Ballasts shall be compatible with the lamps

furnished. Furnish number and size of ballasts as required to operate the number of lamps indicated with the control schemes shown.

- B. Fluorescent ballasts for light fixtures controlled by occupancy sensors shall be programmed start ballasts with the lamps wired in parallel. Failure of one lamp shall leave the rest of the lamps illuminated.
- C. Emergency Ballasts: Emergency Ballasts in fluorescent fixtures shall consist of an automatic power failure device, a test switch, and a pilot light that is visible from outside of the fixture. They shall contain a fully automatic solid state charger in a self-contained power pack. The fixture shall be factory wired in a manner that will allow the emergency lamps to be switched while still maintaining charging power to the battery. Wiring Diagrams shall be furnished with the fixture showing switching connections. The battery shall be of the sealed electrolyte type with the capacity to provide power to the lamps provided for a minimum of 90 minutes at a minimum output as indicated below:

Linear and U-Tube T-8 and T-12 Lamps	1100 Lumens
26W DTT	970 Lumens
26W TRT	450 Lumens
32W TRT	575 Lumens
42W TRT	1000 Lumens

The battery shall be able to operate unattended with no maintenance for a period of no less than five years. Emergency ballasts shall be fully compatible with solid state ballasts. Battery packs shall be mounted inside the fixture unless remotely mounted ballasts are shown on the drawings, or unless the fixture is of a type that does not have room for internally mounted battery packs.

- D. HID ballasts shall be of the high power factor type (0.9 or greater).
- E. Where quartz restrike fixtures are fed at voltages different than 120V, they shall be furnished with integral transformers and all equipment necessary to feed the quartz fixtures at 120V.

2.4 SUPPORTS

- A. Provide all structural members necessary to support fixtures in locations shown on the contract drawings. Submit mounting and support details to the Architect or Engineer for approval with the project shop drawings. Notify the General Contractor prior to bid of any structural work that will be required to support the fixtures.
- B. Provide hangers, cords, stems, etc., where required. Coordinate with the Architect or Engineer for proper stem lengths prior to ordering fixtures.
- C. Support the recessed light fixtures at all four corners of the fixture.
- D. Provide clips for fixtures installed in lay-in ceilings. Clips shall be equal to Erico Caddy clips # 515 or #515A.

PART 3 – EXECUTION

- 3.1 Raceways for lighting systems in accessible ceilings shall be run to junction boxes mounted in locations that do not interfere with the ceiling installation, the luminaire installation, or other building systems. Provide final connections to fixtures using conductors in flexible conduit. Flexible conduit whips shall not exceed six feet in length.
- 3.2 All recessed fixtures shall be mounted with their trims flush against the ceiling.

- 3.3 Comply completely with all manufacturers' installation instructions.
- 3.4 Fixtures shall be warranted for a period of one year after beneficial occupancy. Incandescent lamps shall be warranted for 90 days after beneficial occupancy. Fluorescent and HID lamps shall be warranted for 180 days after beneficial occupancy. LED lamps shall be warranted for a period of two years after beneficial occupancy.

END OF SECTION

SECTION 27.8000
TELEPHONE AND DATA SYSTEMS

PART 1 – GENERAL

- 1.1 Provide complete telephone and data systems in accordance with this specification and the contract drawings. All systems shall be furnished and installed to meet or exceed EIA/TIA Category 6 Standards.
- 1.2 All new wiring on this project shall conform to the EIA TIA 568A T568A or T568B scheme. Consult Owner's IT personnel for which configuration to use. Obtain written instructions to ensure that there are no misunderstandings.
- 1.3 Prior to ordering equipment, provide six sets of manufacturer's cut sheets to the Architect or Engineer for the equipment to be installed. Also submit shop drawings showing the floor plan with all wiring tag identification and conduit and cable routing. Do not order any equipment without receiving submittals and shop drawings that have been reviewed and approved by the Engineer.
- 1.4 Contractors furnishing and installing telephone and data system components shall be regularly involved in furnishing and installing systems of the type specified. They shall have installed five systems similar in size and scope within the past six months. The Telephone and Data System Contractor shall pull the cable as well as install all jacks and make all other system terminations.

PART 2 – PRODUCTS

- 2.1 Outlet Boxes: Provide outlet boxes in accordance with Specification 26 1500.
- 2.2 Plaster Rings: Plaster rings shall be furnished to provide single-gang openings in outlet boxes unless otherwise noted.
- 2.3 Raceways: Provide raceways in accordance with Specification 26 1100.
- 2.4 Jacks: Provide outlet boxes with a strap containing the number of Jacks indicated on the drawings. Outlet jacks shall be 8-position, 8-conductor, RJ-45 jacks that are multivendor supportive accepting most phone and data plugs. Jacks shall have gold-plated (50 microinches minimum) contacts with 110 connections on the back. The jacks shall snap in the straps. The straps shall be colored to match the switches and receptacle color selected by the Architect under the requirements of Specification 26 46 00. The straps shall be covered by a stainless steel wallplate identical to those of the receptacles and switches. Telephone outlet jacks shall be yellow; data jacks shall be blue.
- 2.5 Telephone and Data Cable: Telephone and Data cable shall be Category 6 rated and shall conform to or exceed the EIA/TIA 578 Commercial Building Wiring Standard, Horizontal Cable Section and the EIA/TIA Technical Systems Bulletin 36 for Unshielded Twisted Pair Cables. Other standards supported shall include IEEE 802.3, Ibase5, 10BASE-T; IEEE 802.5, 4 Mbps, 16 Mbps (328 ft/100m), 104 Workstations, proposed ANSI X3T9.5 TP-PMD requirements for UTP at 100 Mbps, and 155 MB ATM. Cabling shall be UL listed. Telephone cables shall be yellow; data cables shall be blue. All Cable shall be plenum rated.
- 2.6 Fiber Optic Cable (Single Mode): All single mode fiber optic cable shall be tight-buffered, 8.7/125 micron, 12 fiber count with SC connectors. The fiber cable shall carry a OFNR (riser rated) UL Listing and be rated for indoor & outdoor use.

- 2.7 Fiber Optic Cable (Multi-Mode): All multi-mode fiber optic cable shall be tight-buffered, 50/125 micron, 12 fiber count with SC connectors. The fiber cable shall carry a OFNR (riser rated) UL Listing and be rated for indoor & outdoor use.
- 2.8 Fiber Optic Patch Panels: Fiber optic cables shall terminate at the Telephone & Data Backboards in fiber optic patch panels. Provide patch panels containing adapter panels for the number of optical fibers shown on the contract documents. The fiber patch panels shall be made of metal and shall have separate doors for the service side and user side with optional keyed locks. Each panel shall include all grommets, cable ties, spools, strain relief brackets, and ID labels required for terminating all optical fibers in the panel. The panel shall be mounted directly to the telephone and data backboard, unless otherwise noted.
- 2.9 Telephone Backbone Cable: The telephone backbone cable shall be Cat 3, 24 Awg., and have a minimum of 50 pairs. The cable shall have a flame retardant PVC outer jacket with sequential footage markings. The conductors shall be solid bare copper with a voltage rating of 300 volts with semi-rigid PVC insulation and shall be UL Listed Type MPR/CMR TIA 568-B.2.
- 2.10 Telephone and Data Backboard: Wall mount a ¾" x 4' x 8' sheet of plywood, primed and painted with two coats of fire retardant paint of the color and finish selected by the Architect. Provide a ¼" x 4" x 17.75" copper ground block (Erico Eritech TMGB-A18L23PT or approved equal) on the wall, bond a #1/0 AWG copper conductor to the ground block with a two hole compression lug and run the #1/0 AWG ground wire to the electrical power system ground. Bond the #1/0 AWG ground wire to the power system electrode using an exothermic weld.
- 2.11 Backboard-Mounted Cable Trough: Provide a continuous run of Silver Zinc Coated CableControl 4 ¾" x 4 ¾" Cable Trough, or approved equal, around the outside perimeter of all backboards, and a continuous run across the middle.
- 2.12 Punchdown Blocks: Telephone cables shall terminate at the Telephone & Data Backboard on Punchdown Blocks. Telephone Cabling shall be terminated on 110 punchdown blocks maintaining the Category 6 rating. Furnish punchdown blocks for all telephone outlets in this contract plus 25% additional outlets.
- 2.13 Patch Panels: Data Cables shall terminate at the Telephone & Data Backboard in patch panels. Provide a patch panel (or panels) containing the number of inputs required for the data cabling shown on the drawings plus 10% spare. Provide mounting brackets for patch panels as required. Provide crossconnecting cables as required to interconnect the patch panels providing the Owner a single connection point for a connection to a server.

PART 3 – EXECUTION

- 3.1 Provide a 1" conduit extending from each outlet box to a point above the nearest accessible ceiling. Terminate the conduit with a protective bushing.
- 3.2 Route conductors from the outlet box, above the lay-in ceilings, and to the telephone and data backboard. Group, tie-wrap, and support the conductors from the structural ceiling above the lay-in ceiling. Provide conduit for sleeves where cables pass through areas with hard ceilings.
- 3.3 Provide a minimum of two data cables to each data outlet or combination telephone/data outlet. Provide one cable to each telephone outlet.
- 3.4 Mount plywood backboard securely to wall framing members. The bottom of the backboard shall be 6" above the finished floor.
- 3.5 Provide a #1/0 copper ground wire in 1-1/4" PVC conduit from the Telephone and Data Backboard to the Building Power System Ground.

- 3.6 Service Conduits: Provide two 4" PVC conduits with long radius elbows from the Telephone and Data Backboard to the telephone company right-of-way. Conduits bends shall contain radii that are no less than 10 times the conduit diameter. Coordinate the exact termination point with the telephone company. Comply completely with all telephone company requirements. Furnish conduits with pullstrings. Stub conduits up 4" above the floor at the Telephone and Data Backboard and cover with plastic caps. Do not glue the caps on the conduits. Seal conduits below grade to prohibit the entrance, of dirt, water, and gases. Service conduits shall be buried 24" to 36" below grade. Mark the end of the conduits by placing a vertical stick of conduit from the end of the conduit vertically to a point at least 12" above grade. Provide physical protection as well as warning tape attached to stakes around the marker.
- 3.7 Equip all service conduits with a pullwire or string capable of withstanding 600 pounds of pulling tension.
- 3.8 Uniquely identify and label all cables at each end using EIA/TIA Standards. Provide engraved or professionally stenciled label markings on the faceplate beside each jack.
- 3.9 Use a Certification Tester meeting TIA/ISO Level II or IV Accuracy requirements to prove that cabling meets structured cabling manufacturer's warranty requirements. The tester must provide Pass/Fail results compliant with TIA/ISO standards. The tester must be a Fluke DTX CableAnalyzer or approved equal. Provide documentation reports containing all measurement data (MHz, dB, NEXT, EFLEXT, RL). Test cable to ensure that it supports Category Rated Network Speed and provide evidence in report. Test each cable for opens, shorts, correct pairs, crossed wiring, and proper termination approved equal. Replace any cable that is unable to pass the tests. Provide a written log of the test results of each cable to the Engineer at the prefinal inspection. Demonstrate testing of any cables selected by the Engineer.

END OF SECTION