Contract Documents and Specifications

For

Coliseum Laundry Room For Basketball – General Construction Work

For

University of South Carolina

Project # FP00000296

August 5, 2019

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Project Name: Coliseum Laundry Room For Basketball – General Construction Work

SE-311
INVITATION FOR MINOR CONSTRUCTION QUOTES

PROJECT NAME: Coliseum Laundry Room For Basketball - General Construction Work

PROJECT NUMBER: FP00000296

PROJECT LOCATION: Carolina Coliseum

BID SECURITY REQUIRED? Yes ☐ No ☒

PERFORMANCE BOND REQUIRED? Yes ☐ No ☒

PAYMENT BOND REQUIRED? Yes ☐ No ☒ **CONSTRUCTION COST RANGE:** $ < $ 50,000.

DESCRIPTION OF PROJECT: General Construction work related to creating a new laundry room for men's and women's basketball teams. The only official site visit will be offered immediately after the pre-bid meeting. Small and minority business participation is highly encouraged.

BIDDING DOCUMENTS/PLANS MAY BE OBTAINED FROM: purchasing.sc.edu: Facilities/Construction Solicitations/Awards

PLAN DEPOSIT AMOUNT: $ $0.00 **IS DEPOSIT REFUNDABLE** Yes ☐ No ☐ N/A ☒

Bidders must obtain Bidding Documents/Plans from the above listed source(s) to be listed as an official plan holder. Only those Bidding Documents/Plans obtained from the above listed source(s) are official. Bidders rely on copies of Bidding Documents/Plans obtained from any other source at their own risk.

IN ADDITION TO THE ABOVE OFFICIAL SOURCE(S), BIDDING DOCUMENTS/PLANS ARE ALSO AVAILABLE AT:

N/A

All questions & correspondence concerning this Invitation shall be addressed to the A/E.

A/E NAME: Garvin Design Group

A/E CONTACT: Terry Buchmann

A/E ADDRESS: **Street/PO Box:** 1209 Lincoln St

City: Cola **State:** SC **ZIP:** 29201-

EMAIL: tbuchmann@garvindesigngroup.com

TELEPHONE: 803-212-1032 **FAX:**

AGENCY: University of South Carolina

AGENCY PROJECT COORDINATOR: Hatice Hikmet

ADDRESS: **Street/PO Box:** 1300 Picken St

City: Cola **State:** SC **ZIP:** 29208-

EMAIL: hikmeth@mailbox.sc.edu

TELEPHONE: 803-7779994 **FAX:** 803-777-7334

PRE-QUOTE CONFERENCE: Yes ☒ No ☐ **MANDATORY ATTENDANCE:** Yes ☐ No ☒

PRE-QUOTE DATE: 8/21/2019 **TIME:** 10:30am **PLACE:** 1300 Pickens St., Cola. SC 29208. CR 100C

QUOTE CLOSING DATE: 8/29/2019 **TIME:** 3:30pm **PLACE:** 1300 Pickens St., Cola.. SC 29208. CR 100C

QUOTE DELIVERY ADDRESSES:

HAND-DELIVERY:
Attn: Hatice Hikmet
1300 Pickens St
Columbia. SC 29208

MAIL SERVICE:
Attn: Hatice Hikmet
1300 Pickens St
Columbia. SC 29208

APPROVED BY: _____ **DATE:** _____
(Agency Project Coordinator)

SE-331
QUOTE FORM

Quotes shall be submitted only on SE-331.

QUOTE SUBMITTED BY: _____

(Offeror's Name)

QUOTE SUBMITTED TO: University of South Carolina

(Owner's Name)

FOR: PROJECT NAME: Coliseum Laundry Room For Basketball - General Construction Work

PROJECT NUMBER: FP00000296

OFFER

1. In response to the Invitation for Minor Construction Quotes for the above-named Project, the undersigned **OFFEROR** proposes and agrees, if this Quote is accepted, to enter into a Contract with the Owner in the form included in the Solicitation Documents, and to perform all Work as specified or indicated in the Solicitation Documents, for the prices and within the time frames indicated in the Solicitation and in accordance with the other terms and conditions stated.

2. **OFFEROR** acknowledges the receipt of the following Addenda to the Solicitation documents and has incorporated the effects of said Addenda into its Quote *(Bidder, check only boxes that apply.)*:

   ADDENDA: ☐ #1 ☐ #2 ☐ #3 ☐ #4 ☐ #5

3. **OFFEROR** agrees that this Quote, including all alternates, if any, may not be revoked or withdrawn after the opening of quotes, and shall remain open for acceptance for a period of **60** Days following the Quote Date, or for such longer period of time that **OFFEROR** may agree to in writing upon request of the Owner.

4. **OFFEROR** agrees that from the compensation to be paid, the Owner shall retain as Liquidated Damages the amount of **$ 100.00** for each calendar day the actual construction time required to achieve Substantial Completion exceeds the specified or adjusted Contract Time for Substantial Completion, as provided in the Contract Documents.

5. **OFFEROR** herewith submits its offer to provide all labor, materials, equipment, tools of trades and labor, accessories, appliances, warranties and guarantees, and to pay all royalties, fee, permits, licenses and applicable taxes necessary to complete the following items of construction work:

   5.1 BASE QUOTE $_____

   (enter BASE QUOTE in figures only)

   5.1.1 ALTERNATE NO. 1 $_____ **to be ADDED / DEDUCTED from BASE QUOTE.**
   (circle one)

   5.1.2 ALTERNATE NO. 2 $_____ **to be ADDED / DEDUCTED from BASE QUOTE.**
   (circle one)

SC Contractor's License Number:_____

Classification(s) & Limits:_____

Address: _____

_____

Telephone:_____

E-mail:_____

This Quote is hereby submitted on behalf of the Offeror named above.

BY:_____
(Signature of Offeror's Representative)

_____
(Print or Type Name of Offeror's Representative)

TITLE:_____

USC SUPPLEMENTAL GENERAL CONDITIONS FOR CONSTRUCTION PROJECTS

WORK AREAS

1. The Contractor shall maintain the job site in a safe manner at all times. This includes (but is not limited to) the provision and/or maintenance of lighting, fencing, barricades around obstructions, and safety and directional signage.

2. Contractor's employees shall take all reasonable means not to interrupt the flow of student traffic in building corridors, lobbies, stairs and exterior walks. All necessary and reasonable safety precautions shall be taken to prevent injury to building occupants while transporting materials and equipment through the work area. Providing safe, accessible, plywood-shielded pedestrian ways around construction may be required if a suitable alternative route is not available.

3. At the beginning of the project, the USC Project Manager will establish the Contractor's lay-down area. This area will also be used for the Contractor's work vehicles. The lay-down area will be clearly identified to the contractor by the Project Manager, with a sketch or drawing provided to USC Parking Services. In turn, Parking Services will mark off this area with a sign containing the project name, Project Manager's name, Contractor name and contact number, and end date. Where this area is subject to foot traffic, protective barriers will be provided as specified by the Project Manager. The area will be maintained in a neat and orderly fashion.

4. Work vehicles parked in the lay down area (or designated parking areas) will be clearly marked and display a USC-furnished placard for identification. No personal vehicles will be allowed in this area, or in any areas surrounding the construction site. Personal vehicles must be parked in the perimeter parking lots or garages. Temporary parking permits can be obtained at the Contractor's expense at the USC Parking Office located in the Pendleton Street parking garage. Refer to the CAMPUS VEHICLE EXPECTATIONS (below) for additional information.

5. Contractor is responsible for removal of all debris from the site, and is required to provide the necessary dumpsters which will be emptied on a regular basis. Construction waste must not be placed in University dumpsters. The construction site must be thoroughly cleaned with all trash picked up and properly disposed of on a daily basis and the site must be left in a safe and sanitary condition each day. The University will inspect job sites regularly and will fine any contractor found to be in violation of this requirement an amount of up to $1,000 per violation.

6. Where it is necessary to jump curbs, dimensional lumber and plywood must be built up to appropriate curb elevation to protect curbs from damage. Contractor will be responsible for any project related damage.

7. The Contractor shall be responsible for erosion and sediment control measures where ground disturbances are made.

PROJECT FENCING

8. All construction projects with exterior impacts shall have construction fencing at the perimeter. Fencing shall be 6' chain link with black or green privacy fabric (80-90% blockage). For fence panels with footed stands, sandbag weights shall be placed on the inside of the fence. Ripped sandbags shall be replaced immediately.

9. For projects with long fencing runs and/or high profile locations, decorative USC banners shall be used on top of privacy fabric; banners should be used at a ratio of one banner for every five fence

panels. USC Project Manager will make arrangements for banner delivery for Contractor to hang.

10. The use of plastic safety fencing is discouraged and shall only be used on a temporary basis (less than four weeks) where absolutely necessary. Safety fencing shall be a neon yellow-green, high-visibility fencing equal to 'Kryptonight' by Tenax. Safety fencing shall be erected and maintained in a neat and orderly fashion throughout the project.

11. Vehicles and all other equipment shall be contained within a fenced area if they are on site for more than 3 consecutive calendar days.

BEHAVIOR

12. Fraternization between Contractor's employees and USC students, faculty or staff is strictly prohibited.

13. USC will not tolerate rude, abusive or degrading behavior on the job site. Heckling and cat-calling directed toward students, faculty or staff or any other person on USC property is strictly prohibited. Any contractor whose employees violate this requirement will be assessed a fine of up to $500 per violation.

14. Contractor's employees must adhere to the University's policy of maintaining a drug-free and tobacco-free campus. Tobacco product trash that is found on the jobsite may result in a $25/piece fee.

HAZARDOUS MATERIALS & SAFETY COMPLIANCE

15. A USC Permit to Work must be signed prior to any work being performed by the general contractor or sub-contractor(s).

16. The contractor will comply with all regulations set forth by OSHA, EPA and SCDHEC. Contractor must also adhere to USC's internal policies and procedures (available by request). Upon request, the contractor will submit all Safety Programs and Certificates of Insurance to the University for review.

17. Contractor must notify the University immediately upon the discovery of suspect material which may contain asbestos or other such hazardous materials. These materials must not be disturbed until approved by the USC Project Manager.

18. In the event of an OSHA inspection, the Contractor shall immediately call the Facilities Call Center, 803-777-4217, and report that an OSHA inspector is on site. An employee from USC's Safety Unit will arrive to assist in the inspection.

LANDSCAPE & TREE PROTECTION

19. In conjunction with the construction documents, the USC Arborist shall direct methods to minimize damage to campus trees. Tree protection fencing is required to protect existing trees and other landscape features to be affected by a construction project. The location of this fence will be evaluated for each situation with the USC Arborist, Landscape Architect and Project Manager. Tree protection fencing may be required along access routes as well as within the project area itself. Fence locations may have to be reset throughout the course of the project.

20. The tree protection fence shall be 6' high chain link fence with 80-90% privacy screening unless otherwise approved by USC Arborist and/or Landscape Architect. If the tree protection fence is completely within a screened jobsite fence perimeter, privacy fabric is not required. In-ground

fence posts are preferred in most situations for greater protection. If utility or pavement conflicts are present, fence panels in footed stands are acceptable. See attached detail for typical tree protection fencing.

21. No entry, vehicle parking, or materials storage will be allowed inside the tree protection zone. A 4" layer of mulch shall be placed over the tree protection area to maintain moisture in the root zone.

22. Where it is necessary to cross walks, tree root zones (i.e., under canopy) or lawns the following protective measures shall be taken:

    a. For single loads up to 9,000 lbs., a 3/4" minimum plywood base shall be placed over 4" of mulch.
    b. For single loads over 9,000 lbs., two layers of 3/4" plywood shall be placed over 4" of mulch.
    c. Plywood sheets shall be replaced as they deteriorate or delaminate with exposure.
    d. For projects requiring heavier loads, a construction entry road consisting of 10' X 16' oak logging mats on 12" coarse, chipped, hardwood base. Mulch and logging mats shall be supplemented throughout the project to keep matting structurally functional.

23. Damage to any trees during construction shall be assessed by the USC Arborist, who will stipulate what action will be taken for remediation of damage. The cost of any and all remediation will be assumed by the contractor at no additional cost to the project. Compensation for damages may be assessed up to $500 per caliper inch of tree (up to 8") and $500 per inch of diameter at breast height (for trees over 8").

24. Damage to trunks and limbs, as well as disturbance of the root zone under the dripline of tree, including compaction of soil, cutting or filling, or storage of materials, shall qualify as damage and subject to remediation.

25. Any damage to existing pavements or landscaping (including lawn areas and irrigation) will be remediated before final payment is made.

TEMPORARY FACILITIES

26. Contractor will be responsible for providing its own temporary toilet facilities, unless prior arrangements are made with the USC Project Manager.

27. Contractor must provide its own electrical power supply. Water may be available to the extent of existing sources. Any needed or desired taps, connections, or metering devices, shall be at the sole expense of the contractor.

28. Use of USC communications facilities (telephones, computers, etc.) by the Contractor is prohibited, unless prior arrangements are made with the USC Project Manager.

CAMPUS KEYS

29. Contractor must sign a Contractor Key Receipt/Return form before any keys are issued. Keys must be returned immediately upon the completion of the work. The Contractor will bear the cost of any re-keying necessary due to the loss of or failure to return keys.

WELDING

30. A welding (hot work) permit must be issued by the University Fire Marshall before any welding can begin inside a building. The USC Project Manager will coordinate.

PROJECT EVALUATION & CLOSE-OUT

31. For all projects over $100,000, including IDCs, a Contractor Performance Evaluation (SE 397) will be reviewed with the GC at the beginning of the project and a copy given to the GC. At the end of the project the form will be completed by the USC Project Manager and a Construction Performance rating will be established.

32. Contractor must provide all O&M manuals, as-built drawings, and training of USC personnel on new equipment, controls, etc. prior to Substantial Completion. Final payment will not be made until this is completed.

CAMPUS VEHICLE EXPECTATIONS

33. Personal vehicles must be parked in the perimeter parking lots or garages. Temporary parking permits can be obtained at the Contractor's expense at the USC Parking Office located in the Pendleton Street parking garage.

34. All motorized vehicle traffic on USC walkways and landscape areas must be approved by the USC Project Manager and Parking Division, have a USC parking placard, and be parked within the approved laydown area. Violators may be subject to ticketing, towing and fines.

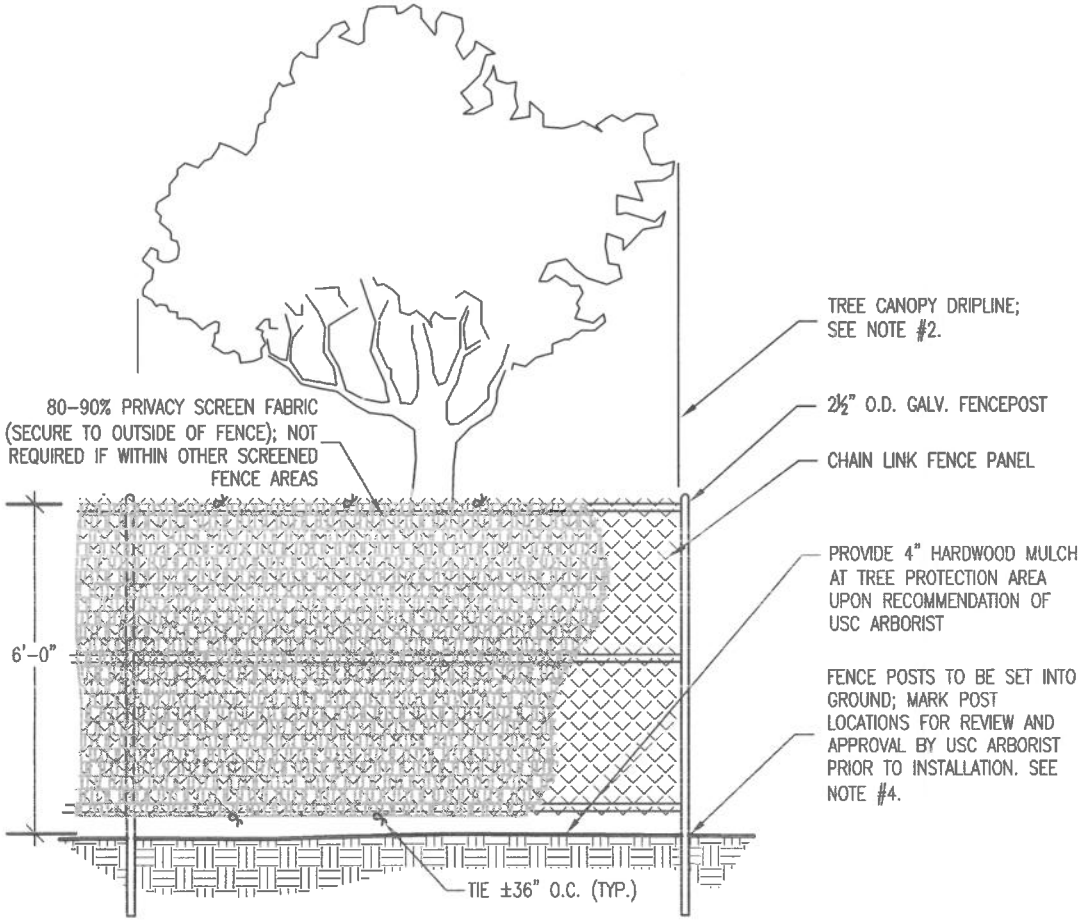
35. All motorized vehicles that leak or drip liquids are prohibited from traveling or parking on walks or landscaped areas.

36. Drivers of equipment or motor vehicles that damage university hardscape or landscape will be held responsible for damages and restoration expense.

37. All vehicles parked on landscape, hardscape, or in the process of service delivery, must display adequate safety devices, i.e. flashing lights, cones, signage, etc.

38. All drivers of equipment and vehicles shall be respectful of University landscape, equipment, structures, fixtures and signage.

39. All incidents of property damage shall be reported to Parking Services or the Work Management Center.



NOTES:

1. PROVIDE PROTECTION FENCING FOR ALL TREES WITHIN AREA OF DISTURBANCE AND CONSTRUCTION ACCESS.
2. PROTECTION FENCING SHALL BE IN PLACE PRIOR TO BEGINNING CONSTRUCTION.
3. PROTECTION FENCING TO BE PLACED AT THE OUTSIDE OF THE CANOPY DRIPLINE, OR AT A DISTANCE OF ONE FOOT PER ONE INCH OF TREE DIAMETER, MEASURED AT BREAST HEIGHT, WHICHEVER IS LARGER, UNLESS OTHERWISE INDICATED ON LANDSCAPE PLAN OR APPROVED BY UNIVERSITY ARBORIST.
4. IN–GROUND POSTS ARE STANDARD. IF EXISTING ROOTS, UTILITIES OR PAVEMENT PRECLUDE USE OF IN–GROUND POSTS, FOOTED STANDS ARE ACCEPTABLE. SAND BAGS SHALL BE PLACED ON THE INSIDE OF FENCE.
5. DAMAGE TO ANY TREES DURING CONSTRUCTION SHALL BE ASSESSED BY UNIVERSITY ARBORIST AND THE UNIVERSITY ARBORIST SHALL STIPULATE WHAT ACTION WILL BE TAKEN FOR REMEDIATION OF DAMAGE. THE COST OF ANY AND ALL REMEDIATION WILL BE ASSUMED BY CONTRACTOR AT NO ADDITONAL COST TO THE PROJECT.
6. DISTURBANCE OF ROOT ZONE UNDER DRIPLINE OF TREE, INCLUDING COMPACTION OF SOIL, CUTTING OR FILLING OR STORAGE OF MATERIALS SHALL QUALIFY AS DAMAGE AND SUBJECT TO REMEDIATION.

TREE PROTECTION FENCING (IN–GROUND) WITH SCREENING

NO SCALE REVISED 8.28.14

Project Name: Coliseum Laundry Room For Basketball – General Construction Work

Project Number: FP000000296

University of South Carolina

CONTRACTOR'S ONE YEAR GUARANTEE

STATE OF _____

COUNTY OF _____

WE_____
as General Contractor on the above-named project, do hereby guarantee that all work executed under the requirements of the Contract Documents shall be free from defects due to faulty materials and /or workmanship for a period of one (1) year from date of acceptance of the work by the Owner and/or Architect/Engineer; and hereby agree to remedy defects due to faulty materials and/or workmanship, and pay for any damage resulting wherefrom, at no cost to the Owner, provided; however, that the following are excluded from this guarantee;

Defects or failures resulting from abuse by Owner.

Damage caused by fire, tornado, hail, hurricane, acts of God, wars, riots, or civil commotion.

_____
[Name of Contracting Firm]

*By_____

Title_____

*Must be executed by an office of the Contracting Firm.

SWORN TO before me this
_____ day of _____, 2____ (seal)

_____State

My commission expires _____

08/5/2019

NOTES: Bid for Coliseum Laundry Room For Basketball – General Construction Work

Bidder is to provide pricing for all scope of work shown on sheets A1.1, A2.1 and A3.1 as the base bid quote.

Bidder is to provide pricing for all scope of work shown on sheet A4.1 as Alternate 1.

Bidders is to abide by all applicable specification sections related to the aforementioned scope of work.

All drawings are being provided so that Bidder is aware of concurrent work by other trades. Bidder will be expected to work in conjunction with other trades. Limited parking and laydown area will be provided for all trades.

The Asbestos and Lead Survey Reports are included for reference. Bidders should not include any abatement in their bid scopes. Required abatement will be handled by the university.

Bidders shall have 60 calendar days from Commencement Date to Substantial Completion Date. Liquidated damages of $ 100 per calendar day will be applied for failure to meet substantial completion.

Instructions to Bidders for Minor Construction Projects

1. Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The Drawings, Specifications and all Addenda issued prior to execution of the Purchase Order.

2. Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

3. A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

4. The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.

5. An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

6. A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

7. The Bidder by making a Bid represents that the Bidder has read and understands the Bidding Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

8. The Bid is made in compliance with the Bidding Documents.

9. The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

10. The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

11. Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

12. Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

13. Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

14. The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

15. No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

16. If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

17. No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

18. Addenda will be issued no later than five days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

19. Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

20. Bids shall be submitted on the forms included with the Bidding Documents.

21. All blanks on the bid form shall be legibly executed in a non-erasable medium.

22. Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

23. Interlineations, alterations and erasures must be initialed by the signer of the Bid.

24. All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change."

25. All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

26. Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

27. The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

28. At the discretion of the Owner, if stipulated in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

29. The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

30. It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's own best interests.

31. The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

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SECTION 230900 – CENTRAL CONTROL AND MONITORING SYSTEM

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SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

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SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

SECTION 260553 IDENTIFICATION FOR ELECTRICAL SYSTEMS

SECTION 260583 - EQUIPMENT WIRING CONNECTIONS

SECTION 262416 – PANELBOARDS

SECTION 262726 - WIRING DEVICES

SECTION 262819 - ENCLOSED SWITCHES

SECTION 265100 - INTERIOR LIGHTING

SECTION 265200 - EMERGENCY LIGHTING

SECTION 283110 - FIRE DETECTION AND ALARM

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at jobsite. Time and date to be coordinated with Owner and Architect.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are coordinated with Division 01, Section 011000 – Summary.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Coordination of Owner's continuing occupancy of portions of existing building.

B. Predemolition Photographs or Video: Submit before Work begins.

1.7 QUALITY ASSURANCE

1.8 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Hazardous materials will be removed by the Owner prior to the start of selective demolition.

E. Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within existing spaces, areas, rooms, and openings, including temporary protection, by 6 inches or more.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. If desired, review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

F. Survey of Existing Conditions: Record existing conditions by use of measured drawings and preconstruction photographs.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
b. Equipment to Be Removed: Disconnect and cap services and remove equipment.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
3. Cover and protect furniture, furnishings, and equipment that have not been removed.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
4. Maintain adequate ventilation when using cutting torches.
5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
6. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
7. Dispose of demolished items and materials promptly.

B. Existing Items to Remain: Protect existing construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition, cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

F&ME CONSULTANTS

LIMITED ASBESTOS CONTAINING MATERIAL INVESTIGATION REPORT

USC CAROLINA COLISEUM
ATHLETICS DEPARTMENT'S
LAUNDRY RELOCATION
701 ASSEMBLY STREET
COLUMBIA, SOUTH CAROLINA 29201

PREPARED FOR:

UNIVERSITY OF SOUTH CAROLINA

Ms. Ann G. Derrick
Project Manager
University of South Carolina
1300 Pickens Street
Columbia, South Carolina 29208

PREPARED BY:

F&ME Consultants
1825 Blanding Street
Columbia, South Carolina 29201

November 20, 2018

F&ME Project No.: E5700.360

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This executive summary is intended as an overview for the convenience of the reader. This report should be reviewed in its entirety prior to making any decisions regarding this project.

F&ME Consultants Inc. (F&ME) has completed a Limited Asbestos Containing Material (ACM) Investigation within the Carolina Coliseum for the University of South Carolina in Columbia, SC. The investigation was requested as a component of a planned relocation of the Athletic Departments laundry facilities. Therefore, this investigation covered suspect building materials within areas of the building that may be impacted by the planned renovations. The investigation was conducted in accordance with South Carolina Department of Health and Environmental Control (SCDHEC), United States Environmental Protection Agency (USEPA), National Emission Standards for Hazardous Air Pollutants (NESHAP), and Occupational Safety and Health Administration (OSHA) regulations requiring an ACM investigation prior to any demolition and/or renovation activities.

Per an agreed upon scope of work, F&ME performed this Investigation to identify ACM that may be encountered during the planned renovations, and to make recommendations regarding proper handling and disposal of any ACM found. The scope of work included a limited investigation of the areas of the building and building materials that may be impacted by the planned relocation of the laundry area. The field investigation was performed on October 31, 2018.

The ACM investigation uncovered eight (8) suspect materials that could be impacted by the planned renovations. Of the suspect materials sampled and analyzed, laboratory results indicate that the following materials were found to be positive for asbestos content: black mastic associated with fiberglass duct and pipe insulation, and white mastic associated with fiberglass pipe insulation.

In addition, there is a spray applied surface coating that is found on the exterior perimeter walls of the building structure. This material was identified as an ACM during a previous assessment for the recent men's basketball team spaces renovation that occurred in 2016. If the planned renovations will impact this spray applied surfacing material, it will need to be removed, handles and disposed of as ACM.

We sincerely appreciate the opportunity to assist you with this project. Should you have any questions or require additional information concerning this Investigation, please do not hesitate to contact our office at (803) 254-4540

Sincerely,
F&ME CONSULTANTS

Glynn M. Ellen
Environmental Department Manager
Asbestos Consultant/ Management Planner
SCDHEC License No: MP-20979
Expiration Date 1/29/2019

2. INTRODUCTION

It is our understanding that a renovation is planned to relocate the Athletic Departments laundry facilities to a new location within the USC Carolina Coliseum. Therefore, the scope of this ACM Investigation was to identify, assess and sample suspect building materials/components found within the areas to be impacted by the planned relocation of the laundry facilities. The areas included in this limited investigation included the following rooms/locations: Room 201A, Stairs ST02, Ramp 215A, Room 203, and Hallway H101. See the General Building Plan (Figure 2) in Appendix B for the limits of the investigation. The field investigation was performed on October 31, 2018.

The results, conclusions and recommendations from this investigation are representative of the conditions observed at the site on the date of the field inspection. F&ME does not assume responsibility for any changes in conditions or circumstances that occur after the date of the inspection. This report has been prepared exclusively for USC and shall not be disseminated in whole or part to other parties without prior consent from USC or F&ME Consultants, Inc. No other environmental issues were addressed as part of this report.

3. EXISTING BUILDING STRUCTURE

The Carolina Coliseum is located on the University of South Carolina campus in Columbia, SC. The exterior of the subject building is constructed with concrete walls with an exterior applied texturing. Interior finishes of the structure are concrete floors, drywall walls and ceiling, masonry block walls, concrete ceilings with drop ceilings, vinyl baseboards, and carpeting. See the General Building Plan (Figure 2) in Appendix B for the building's layout. See Appendix A – Site Vicinity Map (Figure 1), for the location of the structure.

Photo 1. University of South Carolina – Carolina Coliseum, Columbia, SC.

4. FIELD ASSESSMENT

The purpose of this Investigation was to locate, sample and record the physical characteristics of suspect ACM building materials within areas included in the renovation that may be impacted by the relocation of the Athletic Departments laundry facilities. During the field assessment, suspect materials were visually inspected and delineated. Once reviewed, the quantities and physical condition of suspect materials were assessed, and bulk samples of these materials were submitted for laboratory analysis.

4.1 Suspect Materials

The purpose of this investigation was to locate, sample and record the physical characteristics of suspect ACM found within the areas of the planned renovations. Therefore, once identified, the quantities and physical condition of suspect roofing materials were assessed, and bulk samples of these materials were submitted for laboratory analysis. The following suspect materials and approximate amounts were identified within the areas of the renovation during this ACM Investigation:

- Carpet Adhesive (~730 SF)
- Baseboard Adhesive (~120 LF)
- 2x2 Textured Ceiling Panels (<1000 SF)
- Wall Skim Coating (~100 SF)
- Black Mastic on Fiberglass Duct and Pipe Insulation (~15 SF)
- Plaster Walls and Ceilings (~500 SF)
- Wood Paneling Adhesive (<1000 SF)
- White Mastic on Fiberglass Pipe Insulation (~5 SF)

Random samples of the suspect materials were collected for laboratory analysis, and their physical characteristics were recorded. Building materials such as concrete, metal, wood, brick, carpet, etc., were not considered suspect ACM. Bulk samples of suspect materials were analyzed by Polarized Light Microscopy (PLM) in accordance with EPA 600/R-93/116. Confirmation Transmission Electron Microscopy (TEM) was also performed on any non-friable organically bound materials that tested negative for asbestos content as per SCDHEC regulations effective May 27, 2011. See Appendix E – Summary of Samples, for complete list of all samples taken. See Appendix L–SCDHEC Regulation Summary. Proper sampling and chain-of-custody protocols were followed to ensure appropriate handling and delivery of samples to the analytical laboratory. Refer to Appendix K – Personnel Certifications, for SCDHEC qualifications of Investigation personnel, and Appendix J– Chain of Custody Forms, for documentation of proper handling and delivery of samples.

5. ASSESSMENT RESULTS

A total of twenty-six (26) samples were collected from the subject building. A "*first positive stop"* protocol was implemented for this sampling. This protocol establishes that if the first sample of a material tested positive for asbestos content, subsequent samples were not to be analyzed, and would be considered positive as well. Therefore, due to multiple layers of some materials sampled, and the implementation of a "*first positive stop"* protocol, twenty-four (24) samples were analyzed by PLM and three (3) were TEM-confirmed. Based on the sample results, two (2) of the materials

sampled returned positive results for asbestos. These ACM materials are: **black mastic on fiberglass duct and pipe insulation and white mastic on fiberglass pipe insulation.**

In addition, there is a spray applied surface coating that is found on the exterior perimeter walls of the building structure. This material was identified as an ACM during the recent men's basketball team spaces renovation that occurred in 2016. If the planned renovations will impact this spray applied surfacing material, it will need to be removed, handled and disposed of as ACM. See Appendix C –Sample Location Plan, for the various sample locations and Appendix F –Summary of Asbestos Containing Materials, for the materials determined to be ACM.

Appropriate sampling and chain-of-custody protocols were followed to ensure proper handling and delivery of samples to the analytical laboratory. Appendix I – Bulk Asbestos Analytical Report and Appendix J – Laboratory Chain of Custody were provided to show laboratory documentation of the analytical results. Appendix K – Personnel Certification, provides the qualifications for the F&ME Asbestos Inspectors.

5.1 Homogeneous Area Locations Where ACM Was Identified

The following are photographs, descriptions, and approximate quantities of the ACM identified during the Investigation. Guidance is also provided for the proper handling and disposition if the materials in these areas are to be removed. See Appendix D – Homogeneous Area Plans, for homogeneous sampling areas for the various ACM identified below.

HA-1 – Black Mastic on Fiberglass Duct and Pipe Insulation (~15 LF) An asbestos-containing black mastic was found on both on fiberglass duct wrap insulation and on fiberglass insulation noted on mechanical systems piping above the suspended ceiling in Room 201A. This material was noted to be in an intact, non-friable condition with no damage being noted. If this material will be impacted during the planned renovations, it must be removed, handled and disposed of as ACM by a SCDHEC-licensed abatement contractor.

HA-2 –White Mastic on Fiberglass Pipe Insulation (~5 SF) An asbestos-containing white mastic was found on fiberglass pipe insulation was noted on mechanical systems piping at ceiling level in Room 203 (trash compactor room). This material was noted to be in an intact non-friable condition with no damage being noted. If this material will be impacted during the planned renovations, it must be removed, handled and disposed of as ACM by a SCDHEC-licensed abatement contractor.

HA-3 –Spray Applied Exterior Wall Texturing (~5 SF) An asbestos-containing spray applied wall texturing is found on most of the exterior walls of the Coliseum. This material was determined to be an ACM during a previous investigation associated with the 2016 renovations to the men's basketball team spaces. Overall this material was determined to be in an intact, non-friable condition with some localized damage due to deterioration from the elements. If the planned renovation will impact this wall surfacing material it will need to be removed, handled and disposed of as an ACM by a SCDHEC-licensed abatement contractor.

6. RECOMMENDATIONS

The results, conclusions, and recommendations of this investigation are representative of the conditions observed at the site on the date of the field inspection. F&ME does not assume responsibility for any changes in conditions or circumstances that may have occurred after this inspection.

It is our understanding that a renovation is planned to relocate the Athletic Department's laundry facilities to the proposed renovation area of the structure. Therefore, the scope of this ACM Investigation was to identify, assess and sample those materials suspected of containing asbestos that may be impacted within the areas of the planned renovations.

All ACM identified during this Investigation must be abated prior to the commencement of renovation activities, where ACM will, or may potentially, be impacted. In addition, additional

suspect materials may be encountered during the renovations. SCDHEC must be notified in the event any additional ACM is discovered, as well as changes in the condition of identified ACM

If any concealed and/or inaccessible ACM are encountered during abatement and/ or renovation activities, the affected contractor(s) must stop work, take appropriate actions, and notify the Owner or the Owner's Environmental consultant for an appropriate response action. The SCDHEC must be notified in the event any additional ACM is discovered, as well as changes in the condition of identified ACM. Appendix M – Abatement Project Forms, are provided for more information. See Appendix G – Summary of Inspection and Appendix H –Physical Assessment Data Sheets, for description and condition of ACM materials.

All abatement work must be performed by an AHERA-certified and SCDHEC-licensed Abatement Contractor. This work must be performed in accordance with all applicable regulations and guidelines, such as notification and air monitoring requirements. All asbestos waste, including contaminated building materials, must be deposited in a landfill permitted by the SCDHEC for receiving ACM.

The SCDHEC's Standards of Performance for Asbestos Projects (R 61-86.1) includes requirements for abatement projects regarding notifications, project design, air sampling and analysis, etc. For informational purposes, some of these requirements are summarized below:

Notifications. Written notification (SCDHEC Form 3430) must be submitted to SCDHEC at least two (2) calendar weeks prior to initiation of abatement activities for renovation/demolition projects. A copy of this inspection report and applicable fee payment must be attached to the notification. Additional fees may be required. Copies of all notifications and documents pertinent to the abatement operations must be posted on the job site during abatement work. The Owner/Operators must notify all parties involved with this project of the nature of the work as well as the locations and quantities of asbestos materials to be disturbed or those located near the renovation areas. This notification requirement is also extended to any persons/employees who work near the renovation areas.

Project Design. Furthermore, abatement projects that will remove more than 3,000 square feet, 1,500 linear feet, or 656 cubic feet of regulated asbestos-containing materials are required to have a licensed and certified Abatement Project Designer develop a project design prior to the commencement of any abatement activities. The Abatement Contractor is required to adhere to the design, which must address all information as directed by the regulations.

Air Monitoring. The Abatement Contractor is responsible for daily personal air sampling for Abatement Workers in compliance with current OSHA standard 29 CFR 1926.1101. All remaining

air monitoring services required for a renovation project (i.e. backgrounds, areas, and clearances) will be provided by the Owner or the Owner's Representative, as required by SCDHEC.

We sincerely appreciate the opportunity to be of service to USC on this project. If you have any questions regarding the information presented herein, please contact our office at (803) 254-4540.

APPENDICES

Appendix A – Site Vicinity Map

Appendix B – General Building Plan

Appendix C – Sample Location Plan

Appendix D – Homogeneous Area Plans

Appendix E – Summary of Samples

Appendix F – Summary of Asbestos Containing Materials

Appendix G – Summary of Inspection

Appendix H – Physical Assessment Data Sheets

Appendix I – Laboratory Analysis Reports

Appendix J – Chain of Custody Forms

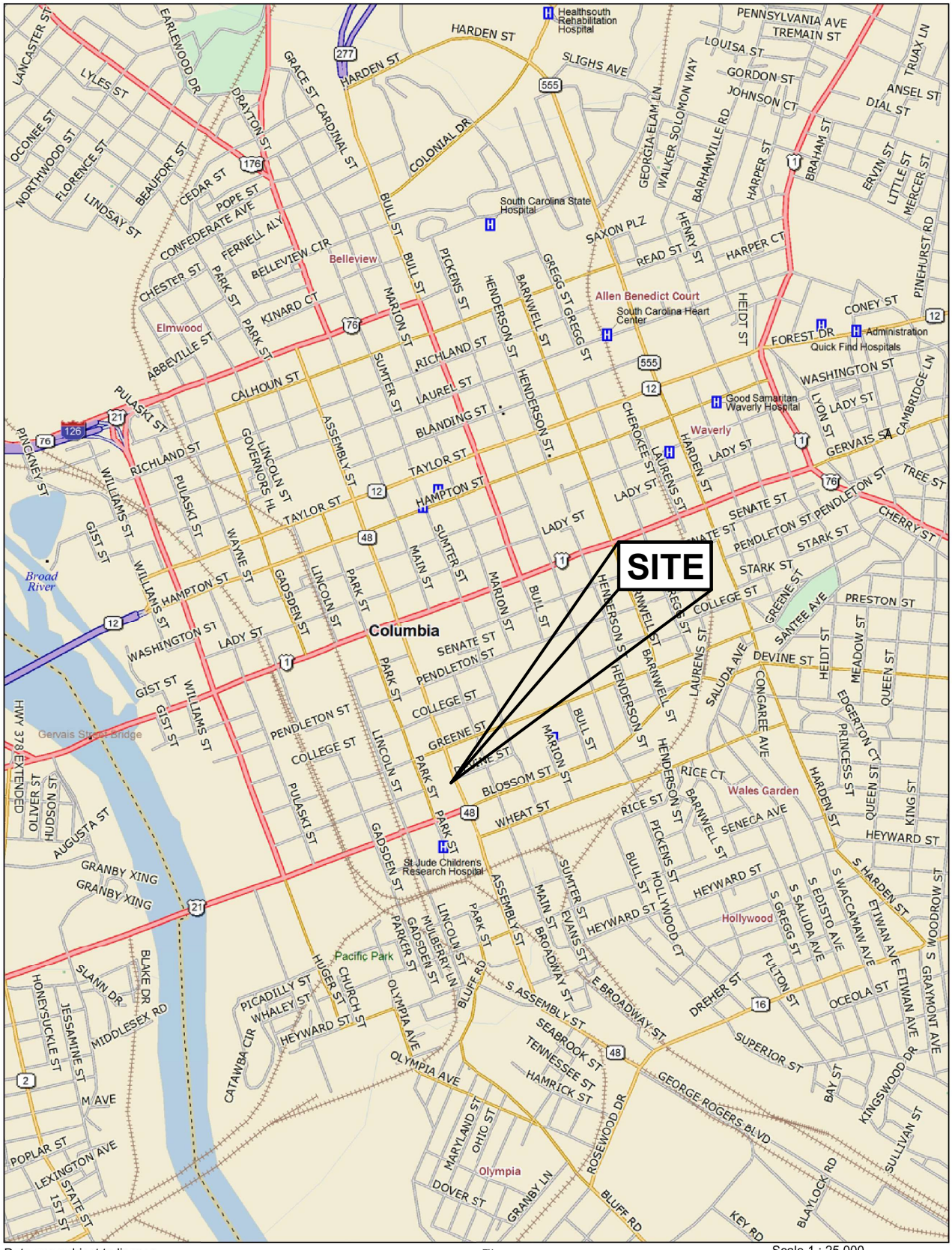
Appendix K – Personnel Certifications

Appendix L – Regulatory Summary

Appendix M – Abatement Project Forms

Appendix A

Site Vicinity Map



Data use subject to license.

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www.delorme.com

TN

MN (7.3°W)

Scale 1 : 25,000

0 600 1200 1800 2400 3000 ft

0 200 400 600 800 1000 m

1" = 2,083.3 ft Data Zoom 13-0

FIGURE NUMBER:	F&ME CONSULTANTS PROJECT NUMBER:	
1	E5700.36	**LIMITED ACM INVESTIGATION** **Carolina Coliseum - Laundry Facility Relocation** Columbia, South Carolina **Site Vicinity Map** Prepared for: University of South Carolina 1301 Pickens Street Columbia, SC 29201

F&ME CONSULTANTS
1825 Blanding Street
Columbia ,SC 29201

ORIGINAL: November 15, 2018		DRWN. BY: GME
REVISIONS:		CHKD. BY: GME
1		APPR. BY: GME
2		NOTES:
3		
SCALE: AS SHOWN		

Appendix B

General Building Plans

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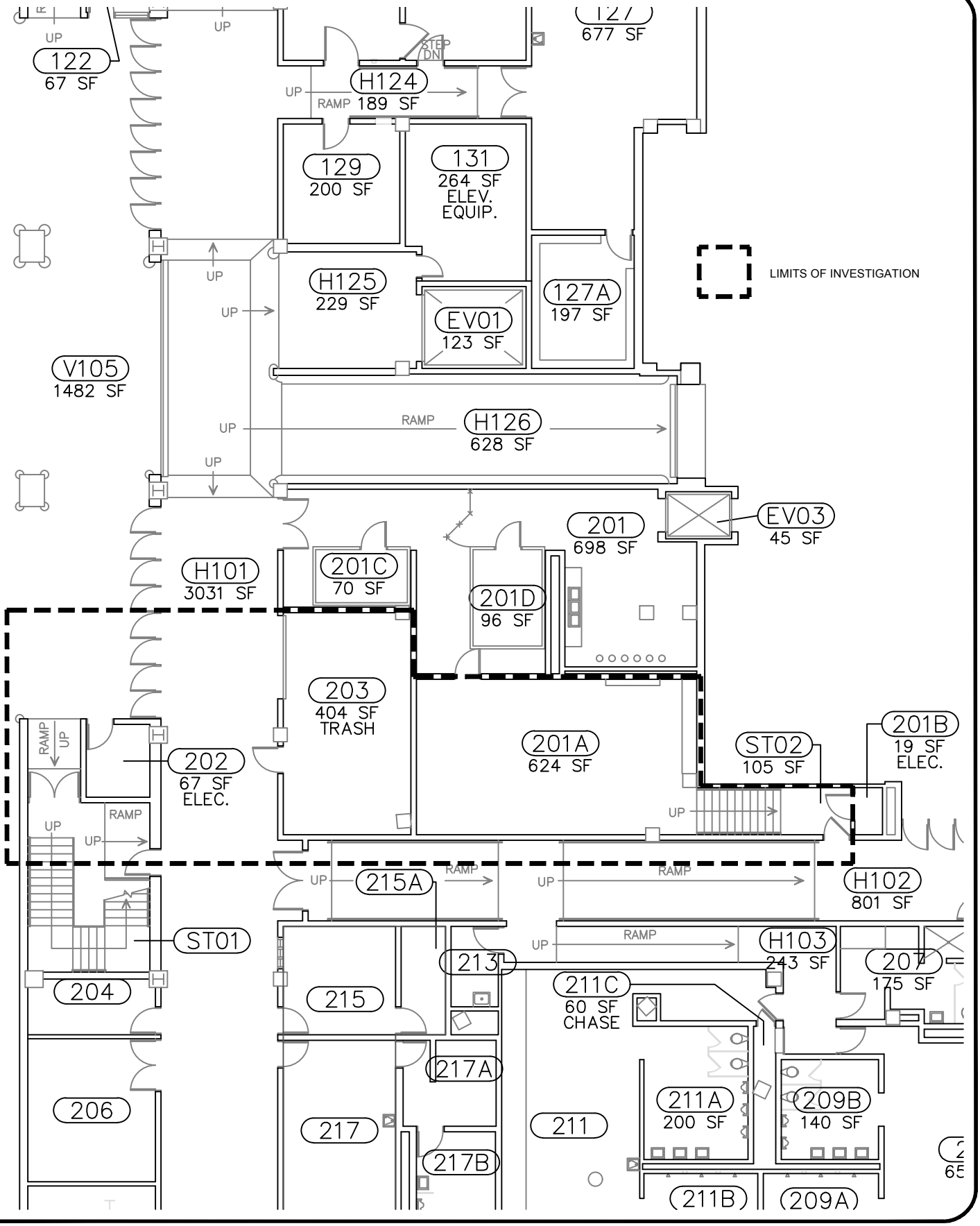

FIGURE NUMBER:	F&ME CONSULTANTS PROJECT NUMBER:			
2	E5700.36	**LIMITED ACM INVESTIGATION** **Carolina Coliseum - Laundry Facility Relocation** Columbia, South Carolina **General Building Plan** Prepared for: University of South Carolina 1301 Pickens Street Columbia, SC 29201	F&ME CONSULTANTS 1825 Blanding Street Columbia ,SC 29201	ORIGINAL: November 15, 2018 REVISIONS: 1 2 3 SCALE: 1/16" = 1.0'

DRWN. BY: GME
CHKD. BY: GME
APPR. BY: GME
NOTES:

Appendix C

Sample Location Plans

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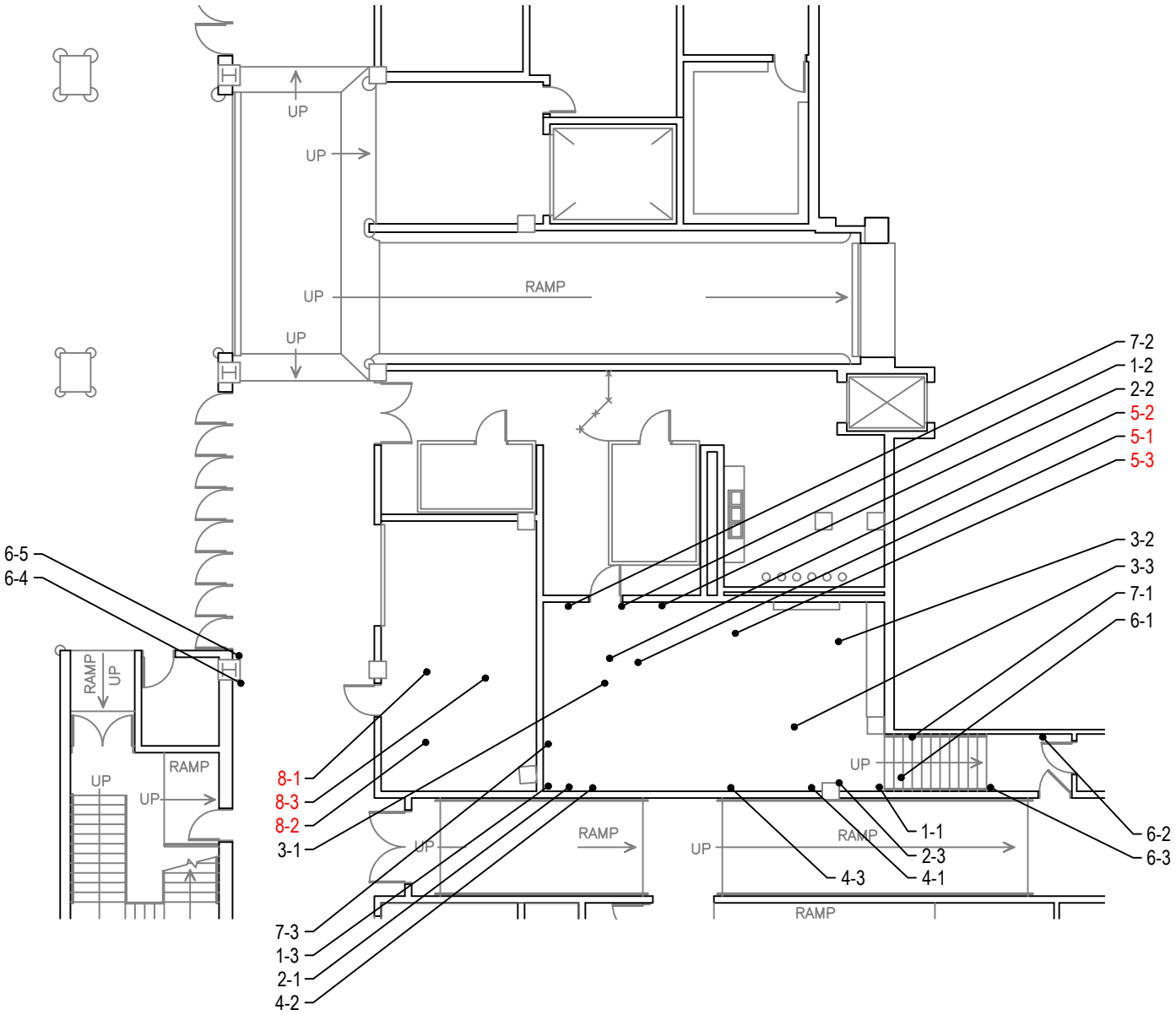

FIGURE NUMBER:	F&ME CONSULTANTS PROJECT NUMBER:			
3	E5700.36	**LIMITED ACM INVESTIGATION** **Carolina Coliseum - Laundry Facility Relocation** Columbia, South Carolina **Sample Location Plan** Prepared for: University of South Carolina 1301 Pickens Street Columbia, SC 29201	F&ME CONSULTANTS 1825 Blanding Street Columbia ,SC 29201	ORIGINAL: November 15, 2018 REVISIONS: 1 2 3 SCALE: 1/16" = 1.0'

DRWN. BY: GME	
CHKD. BY: GME	
APPR. BY: GME	
NOTES:	

Appendix D

Homogeneous Area Plans

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HA-3 - Spray applied wall surfacing material on exterior of the building

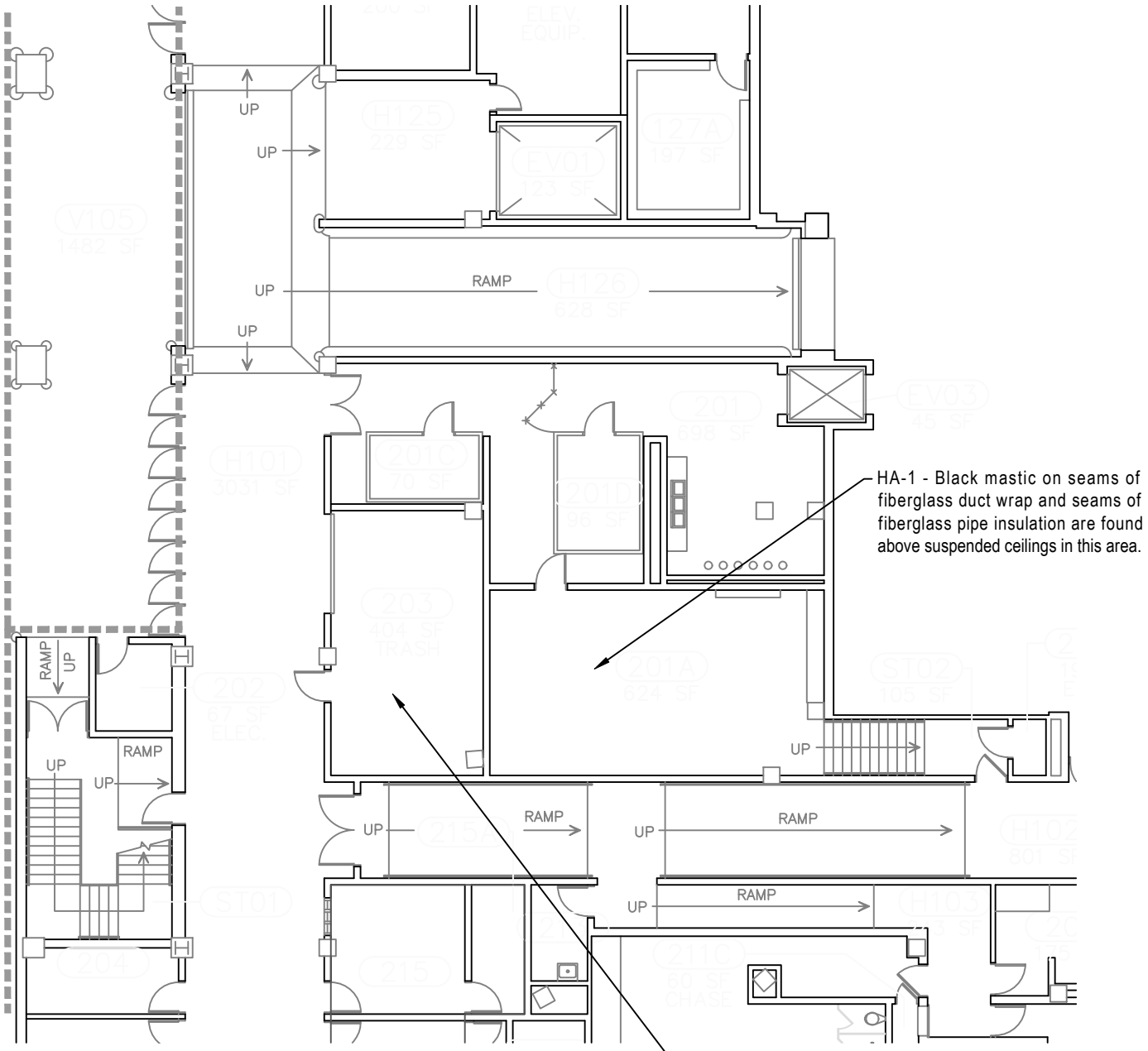

FIGURE NUMBER:	F&ME CONSULTANTS PROJECT NUMBER:			
4	E5700.36	**LIMITED ACM INVESTIGATION** **Carolina Coliseum - Laundry Facility Relocation** Columbia, South Carolina **Homogeneous Area Plan** Prepared for: University of South Carolina 1301 Pickens Street Columbia, SC 29201	F&ME CONSULTANTS 1825 Blanding Street Columbia ,SC 29201	ORIGINAL: November 15, 2018 REVISIONS: 1 2 3 SCALE: 1/16" = 1.0'

DRWN. BY: GME
CHKD. BY: GME
APPR. BY: GME
NOTES:

Appendix E

Summary of Samples

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Appendix E: Summary of Samples

Sample ID	Description
1-1	Carpet Adhesive
1-2	Carpet Adhesive
1-3	Carpet Adhesive
2-1	Baseboard Adhesive
2-2	Baseboard Adhesive
2-3	Baseboard Adhesive
3-1	2x2 Textured Ceiling Panels
3-2	2x2 Textured Ceiling Panels
3-3	2x2 Textured Ceiling Panels
4-1	Wall Skim Coating
4-2	Wall Skim Coating
4-3	Wall Skim Coating
5-1	Black Mastic on Fiberglass Duct and Pipe Insulation
5-2	Black Mastic on Fiberglass Duct and Pipe Insulation
5-3	Black Mastic on Fiberglass Duct and Pipe Insulation
6-1	Plaster Walls and Ceilings
6-2	Plaster Walls and Ceilings
6-3	Plaster Walls and Ceilings
7-1	Wood Paneling Adhesive
7-2	Wood Paneling Adhesive
7-3	Wood Paneling Adhesive
8-1	White Mastic on Fiberglass Pipe Insulation
8-2	White Mastic on Fiberglass Pipe Insulation
8-3	White Mastic on Fiberglass Pipe Insulation

Appendix F

Summary of Asbestos Containing Materials

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APPENDIX F: SUMMARY OF ASBESTOS CONTAINING MATERIALS

Sample ID	Sample Description	Layer	% Asbestos
1-1	Carpet Adhesive		None Detected
1-2	Carpet Adhesive		None Detected
1-3	Carpet Adhesive		None Detected
2-1	Baseboard Adhesive		None Detected
2-2	Baseboard Adhesive		None Detected
2-3	Baseboard Adhesive		None Detected
3-1	2x2 Textured Ceiling Panels		None Detected
3-2	2x2 Textured Ceiling Panels		None Detected
3-3	2x2 Textured Ceiling Panels		None Detected
4-1	Wall Skim Coating		None Detected
4-2	Wall Skim Coating		None Detected
4-3	Wall Skim Coating		None Detected
5-1	Black Mastic on Fiberglass Duct and Pipe Insulation		8% Chrysotile
5-2	Black Mastic on Fiberglass Duct and Pipe Insulation		Positive Stop
5-3	Black Mastic on Fiberglass Duct and Pipe Insulation		Positive Stop
6-1	Plaster Walls and Ceilings	Skim	None Detected
		Rough Coat	None Detected
6-2	Plaster Walls and Ceilings	Skim	None Detected
		Rough Coat	None Detected
6-3	Plaster Walls and Ceilings	Skim	None Detected
		Rough Coat	None Detected
6-4	Plaster Walls and Ceilings	Skim	None Detected
		Rough Coat	None Detected
6-5	Plaster Walls and Ceilings	Skim	None Detected
		Rough Coat	None Detected
7-1	Wood Paneling Adhesive		None Detected
7-2	Wood Paneling Adhesive		None Detected
7-3	Wood Paneling Adhesive		None Detected
8-1	White Mastic on Fiberglass Pipe Insulation		6% Chrysotile
8-2	White Mastic on Fiberglass Pipe Insulation		Positive Stop
8-3	White Mastic on Fiberglass Pipe Insulation		Positive Stop

Appendix G

Summary of Inspection

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SUMMARY OF INSPECTION

The following tables summarize the physical assessment data, sampling and assessment results.

As exhibited on these tables, coding is used to abbreviate the asbestos containing materials' (ACM) locations, characteristics and results. These codes are as follows:

TYPES OF ACM:

Misc. = Miscellaneous

Sur. = Surfacing

TSI = Thermal System Insulation

ACM LOCATIONS:

Homogeneous areas = Indicated by Roman Numerals, Room Number or Area Designation

Functional Space No.:	Functional Space Type:	
1.	ST	Storage Room
2.	CR	Compactor Room
3.	H	Hallway
4.	EXT	Exterior of Building

ACM CHARACTERISTICS:

F = Friable

NF = Non-Friable

ASSESSMENT RESULTS:

(Refer to Physical Assessment Data)

POTENTIAL FOR DISTURBANCE:

(Refer to Physical Assessment Data)

SUMMARY OF INSPECTION

PHYSICAL ASSESSMENT CATAGORIES:

1. Damaged or significantly damaged friable thermal system insulation ACM.
2. Damaged friable surfacing ACM.
3. Significantly damaged friable surfacing ACM.
4. Damaged or significantly damaged friable miscellaneous ACM.
5. ACM with potential for significant damage.
6. ACM with potential for damage.
7. Any remaining friable ACM or friable suspect ACM.
8. Non-friable ACM.

CLASSIFICATION FOR HAZARD POTENTIAL:

(Tabular Display)

Hazard Rank	ACM Condition	ACM Disturbance Potential
7	Significantly Damaged	Any
6	Damaged	Potential for Significant Damage
5	Damaged	Potential for Damage
4	Damaged	Low
3	Good	Potential for Significant Damage
2	Good	Potential for Damage
1	Good	Low

Appendix H

Physical Assessment Data Sheets

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PHYSICAL ASSESSMENT DATA SHEET

Building: USC Carolina Coliseum

Functional Space No: 1 **Type:** ST **Location:** (See Homogeneous Area Plan)

Type of Suspect Material: _____ **TSI** _____ **Surfacing** X **Misc.**

Description: HA-1, Black Mastic on fiberglass duct and pipe insulation

Approximate Amount of Material (SF or LF): _____

Condition:

Percent Damage: **X** >0% _____ <10% _____ >10% _____ <25% _____ >25%

Extent of Damage: _____ Localized **X** Distributed

Type of Damage: **X** Deterioration _____ Water _____ Physical

Description:

This material was found on both fiberglass duct wrap insulation and on fiberglass pipe insulation on mechanical systems piping above the suspended ceiling in Room 201A. This material was noted to be in an intact, non-friable condition with no damage being noted.

Overall Condition Rating: Sig. Damaged _____ Damaged _____ Good **X**

Potential for Disturbance:

	High	**Moderate**	**Low**	**Friable ACM**
Frequency of Potential Contact:			**X**	
Influence of Vibration			**X**	
Frequency of Air Erosion			**X**	
Potential of Water Erosion			**X**	

Overall Potential Disturbance Rating:

Potential for Sig. Damage	Potential for Damage	Low Potential for Damage
		8

Overall Hazard Rank #:

Sig. Damaged	Pot. Sig. Damage	Potential Damage	Low Pot. Damage
			1

Comments: Potential for Disturbance and Hazard Ranking assessed is based on current usage of the facility.

Signed: _____ **Date:** **11/17/2018**

PHYSICAL ASSESSMENT DATA SHEET

Building: USC Carolina Coliseum

Functional Space No: 2 **Type:** CR **Location:** (See Homogeneous Area Plan)

Type of Suspect Material: ____ **TSI** ____ **Surfacing** X **Misc.**

Description: HA-2, White Mastic associated with fiberglass pipe insulation

Approximate Amount of Material (SF or LF): 5 SF

Condition:

Percent Damage: X >0% ____ <10% ____ >10% ____ <25% ____ >25%

Extent of Damage: ____ Localized X Distributed

Type of Damage: X Deterioration ____ Water ____ Physical

Description:

This material was found on fiberglass pipe insulation on mechanical systems piping at ceiling level in Room 203 (trash compactor room). This material was noted to be in an intact non-friable condition with no damage being noted.

Overall Condition Rating: Sig. Damaged ____ Damaged ____ Good X

Potential for Disturbance:

	High	Moderate	Low	Friable ACM
Frequency of Potential Contact:			X	
Influence of Vibration			X	
Frequency of Air Erosion			X	
Potential of Water Erosion			X	

Overall Potential Disturbance Rating:

Potential for Sig. Damage	Potential for Damage	Low Potential for Damage
		8

Overall Hazard Rank #:

Sig. Damaged	Pot. Sig. Damage	Potential Damage	Low Pot. Damage
			1

Comments: Potential for Disturbance and Hazard Ranking assessed is based on current usage of the facility.

Signed:  **Date:** 11/17/2018

PHYSICAL ASSESSMENT DATA SHEET

Building: USC Carolina Coliseum

Functional Space No: 4 **Type:** EXT **Location:** (See Homogeneous Area Plan)

Type of Suspect Material: _____ **TSI** X **Surfacing** _____ **Misc.**

Description: HA-3, Spray Applied Wall Texturing

Approximate Amount of Material (SF or LF): >5000 SF

Condition:

Percent Damage: ____ >0% **X** <10% _____ >10% _____ <25% _____ >25%

Extent of Damage: **X** Localized **X** Distributed

Type of Damage: **X** Deterioration **X** Water **X** Physical

Description:

This material is found on the exterior walls of most of the Coliseum. Overall this material was determined to be in an intact, non-friable condition with some localized damage due to deterioration from the elements.

Overall Condition Rating: Sig. Damaged _____ Damaged _____ Good **X**

Potential for Disturbance:

	High	Moderate	Low	Friable ACM
Frequency of Potential Contact:			**X**	
Influence of Vibration			**X**	
Frequency of Air Erosion			**X**	
Potential of Water Erosion			**X**	

Overall Potential Disturbance Rating:

Potential for Sig. Damage	Potential for Damage	Low Potential for Damage
		8

Overall Hazard Rank #:

Sig. Damaged	Pot. Sig. Damage	Potential Damage	Low Pot. Damage
			1

Comments: Potential for Disturbance and Hazard Ranking assessed is based on current usage of the facility.

Signed: _____ **Date:** **11/17/2018**

Appendix I

Laboratory Analysis Reports

EMSL Analytical, Inc.

706 Gralin Street Kernersville, NC 27284

Tel/Fax: (336) 992-1025 / (336) 992-4175

http://www.EMSL.com / greensborolab@emsl.com

EMSL Order:	021808200
Customer ID:	FMEC62
Customer PO:	E5700.36
Project ID:	

Attention:	Glynn M. Ellen	**Phone:**	(803) 254-4540
	F & ME Consultants	**Fax:**	(803) 254-4542
	1825 Blanding Street	**Received Date:**	11/02/2018 9:15 AM
	Columbia, SC 29201	**Analysis Date:**	11/06/2018
		Collected Date:	11/01/2018
Project:	Coliseum Laundry Relocation		

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
1-1 *021808200-0001*	Carpet Adhesive	Tan/Beige Fibrous Homogeneous	<1% Cellulose 2% Synthetic	98% Non-fibrous (Other)	None Detected
1-2 *021808200-0002*	Carpet Adhesive	Tan/Yellow Non-Fibrous Homogeneous	1% Cellulose 3% Synthetic	96% Non-fibrous (Other)	None Detected
2-1 *021808200-0003*	Baseboard Adhesive	Brown Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
2-2 *021808200-0004*	Baseboard Adhesive	Brown/Tan Non-Fibrous Homogeneous	<1% Cellulose <1% Synthetic	100% Non-fibrous (Other)	None Detected
3-1 *021808200-0005*	2x2 Textured Ceiling Panels	Gray/White Fibrous Heterogeneous	20% Cellulose 55% Min. Wool	15% Perlite 10% Non-fibrous (Other)	None Detected
3-2 *021808200-0006*	2x2 Textured Ceiling Panels	Gray/White Fibrous Heterogeneous	20% Cellulose 55% Min. Wool	15% Perlite 10% Non-fibrous (Other)	None Detected
3-3 *021808200-0007*	2x2 Textured Ceiling Panels	Gray/Tan/White Fibrous Homogeneous	20% Cellulose 55% Min. Wool	20% Perlite 5% Non-fibrous (Other)	None Detected
4-1 *021808200-0008*	Skim Coating	White/Beige Non-Fibrous Heterogeneous	<1% Cellulose	15% Ca Carbonate 85% Non-fibrous (Other)	None Detected
4-2 *021808200-0009*	Skim Coating	White/Beige Non-Fibrous Heterogeneous	1% Cellulose	15% Ca Carbonate 84% Non-fibrous (Other)	None Detected
4-3 *021808200-0010*	Skim Coating	Gray/White Non-Fibrous Heterogeneous	1% Cellulose	40% Quartz 15% Ca Carbonate 44% Non-fibrous (Other)	None Detected
5-1 *021808200-0011*	Black Mastic on FG	Black Fibrous Homogeneous	<1% Cellulose	92% Non-fibrous (Other)	8% Chrysotile
5-2 *021808200-0012*	Black Mastic on FG				Positive Stop (Not Analyzed)
6-1-Skim Coat *021808200-0013*	Plaster Walls and Ceilings	White Non-Fibrous Homogeneous	<1% Cellulose	20% Ca Carbonate 80% Non-fibrous (Other)	None Detected
6-1-Rough Coat *021808200-0013A*	Plaster Walls and Ceilings	Gray Fibrous Homogeneous	1% Cellulose <1% Synthetic	30% Quartz 69% Non-fibrous (Other)	None Detected
6-2-Skim Coat *021808200-0014*	Plaster Walls and Ceilings	White Non-Fibrous Homogeneous	<1% Cellulose	20% Ca Carbonate 80% Non-fibrous (Other)	None Detected
6-2-Rough Coat *021808200-0014A*	Plaster Walls and Ceilings	Gray Non-Fibrous Homogeneous	<1% Cellulose <1% Synthetic	30% Quartz 70% Non-fibrous (Other)	None Detected

Initial report from: 11/06/2018 16:35:25

EMSL Analytical, Inc.

706 Gralin Street Kernersville, NC 27284

Tel/Fax: (336) 992-1025 / (336) 992-4175

http://www.EMSL.com / greensborolab@emsl.com

EMSL Order:	021808200
Customer ID:	FMEC62
Customer PO:	E5700.36
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
6-3-Skim Coat *021808200-0015*	Plaster Walls and Ceilings	White Non-Fibrous Homogeneous		20% Ca Carbonate 80% Non-fibrous (Other)	None Detected
6-3-Rough Coat *021808200-0015A*	Plaster Walls and Ceilings	Gray/Tan Non-Fibrous Heterogeneous	1% Cellulose <1% Synthetic	30% Quartz 69% Non-fibrous (Other)	None Detected
6-4-Skim Coat *021808200-0016*	Plaster Walls and Ceilings	Beige Non-Fibrous Homogeneous		20% Ca Carbonate 80% Non-fibrous (Other)	None Detected
6-4-Rough Coat *021808200-0016A*	Plaster Walls and Ceilings	Gray Non-Fibrous Homogeneous	<1% Cellulose	30% Quartz 70% Non-fibrous (Other)	None Detected
6-5-Dark Grey Plaster *021808200-0017*	Plaster Walls and Ceilings	Gray/Beige Non-Fibrous Heterogeneous	<1% Cellulose	30% Quartz 5% Perlite 65% Non-fibrous (Other)	None Detected
6-5-Grey Plaster *021808200-0017A*	Plaster Walls and Ceilings	Gray/Beige Non-Fibrous Heterogeneous	<1% Cellulose	30% Quartz 5% Perlite 65% Non-fibrous (Other)	None Detected
7-1 *021808200-0018*	Wood Paneling Adhesive	Tan Non-Fibrous Homogeneous	<1% Cellulose	10% Ca Carbonate 90% Non-fibrous (Other)	None Detected
7-2 *021808200-0019*	Wood Paneling Adhesive	Tan Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
8-1 *021808200-0020*	White Pipe Mastic on FG	White Non-Fibrous Homogeneous	<1% Cellulose <1% Glass	94% Non-fibrous (Other)	6% Chrysotile
8-2 *021808200-0021*	White Pipe Mastic on FG				Positive Stop (Not Analyzed)

Analyst(s)

Stephen Bennett (17)

Scott Combs (7)

Stephen Bennett, Laboratory Manager
or Other Approved Signatory

Initial report from: 11/06/2018 16:35:25

EMSL Analytical, Inc.
706 Gralin Street Kernersville, NC 27284
Tel/Fax: (336) 992-1025 / (336) 992-4175
http://www.EMSL.com / greensborolab@emsl.com

EMSL Order: 021808200
Customer ID: FMEC62
Customer PO: E5700.36
Project ID:

Attention: Glynn M. Ellen
F & ME Consultants
1825 Blanding Street
Columbia, SC 29201

Phone: (803) 254-4540
Fax: (803) 254-4542
Received Date: 11/02/2018 9:15 AM
Analysis Date: 11/07/2018
Collected Date: 11/01/2018

Project: Coliseum Laundry Relocation

Test Report: Asbestos Analysis of Non-Friable Organically Bound Materials by TEM via EPA/600/R-93/116 Section 2.5.5.1

Sample ID	Description	Appearance	% Matrix Material	% Non-Asbestos Fibers	Asbestos Types
1-3 *021808200-0022*	Carpet Adhesive	Brown/Tan/Yellow Non-Fibrous Heterogeneous	100	None	No Asbestos Detected
2-3 *021808200-0023*	Baseboard Adhesive	Brown Non-Fibrous Homogeneous	100	None	No Asbestos Detected
7-3 *021808200-0024*	Wood Paneling Adhesive	Tan/Yellow Non-Fibrous Heterogeneous	100	None	No Asbestos Detected

Analyst(s)

Stephen Bennett (3)

Stephen Bennett, Laboratory Manager
or other approved signatory

Samples analyzed by EMSL Analytical, Inc. Kernersville, NC

Initial report from: 11/07/2018 16:12:59

Appendix J

Chain of Custody Forms

OrderID: 021808200

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*: 8207

EMSL ANALYTICAL, INC.
706 GRALIN ST.
KERNERSVILLE, NC 27284
PHONE: (336) 992-1025
FAX: (336) 992-4175

Company Name : F&ME Consultants		**EMSL Customer ID: FME62**	
Street: 1825 Blanding Street		**City: Columbia**	**State/Province: SC**
Zip/Postal Code: 29201	**Country: USA**	**Telephone #: 803-254-4540**	**Fax #: 803-254-4542**
Report To (Name): Glynn Ellen		**Please Provide Results:** ☐ Fax ☒ Email	
Email Address: gellen@fmecol.com		**Purchase Order: E5700.36**	
Project Name/Number: Coliseum Laundry Relocation		**EMSL Project ID** *(Internal Use Only)*:	
U.S. State Samples Taken: SC		**CT Samples:** ☒ **Commercial/Taxable** ☐ **Residential/Tax Exempt**	

EMSL-Bill to: ☒ Same ☐ Different - If Bill to is Different note instructions in Comments**
Third Party Billing requires written authorization from third party

Turnaround Time (TAT) Options* – Please Check

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 48 Hour ☒ 72 Hour ☒ 96 Hour ☐ 1 Week ☐ 2 Week

**For TEM Air 3 hr through 6 hr, please call ahead to schedule.*There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.*

PCM - Air ☐ Check if samples are from NY
- ☐ NIOSH 7400
- ☐ w/ OSHA 8hr. TWA

PLM - Bulk (reporting limit)
- ☒ PLM EPA 600/R-93/116 (<1%)
- ☐ PLM EPA NOB (<1%)

Point Count
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)

Point Count w/Gravimetric
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)
- ☐ NYS 198.1 (friable in NY)
- ☐ NYS 198.6 NOB (non-friable-NY)
- ☐ NYS 198.8 SOF-V
- ☐ NIOSH 9002 (<1%)

TEM – Air ☐ **4-4.5hr TAT (AHERA only)**
- ☐ AHERA 40 CFR, Part 763
- ☐ NIOSH 7402
- ☐ EPA Level II
- ☐ ISO 10312

TEM - Bulk
- ☒ TEM EPA NOB
- ☐ NYS NOB 198.4 (non-friable-NY)
- ☐ Chatfield SOP
- ☐ TEM Mass Analysis-EPA 600 sec. 2.5

TEM – Water: EPA 100.2
- Fibers >10µm ☐ Waste ☐ Drinking
- All Fiber Sizes ☐ Waste ☐ Drinking

TEM- Dust
- ☐ Microvac - ASTM D 5755
- ☐ Wipe - ASTM D6480
- ☐ Carpet Sonication (EPA 600/J-93/167)

Soil/Rock/Vermiculite
- ☐ PLM EPA 600/R-93/116 with milling prep (<1%)
- ☐ PLM EPA 600/R-93/116 with milling prep (<0.25%)
- ☐ TEM EPA 600/R-93/116 with milling prep (<0.1%)
- ☐ TEM Qualitative via Filtration Prep
- ☐ TEM Qualitative via Drop Mount Prep
- ☐ Cincinnati Method EPA 600/R-04/004 – PLM/TEM (BC only)

Other:
- ☐

☒ **Check For Positive Stop – Clearly Identify Homogenous Group** | **Filter Pore Size (Air Samples):** ☐ **0.8µm** ☐ **0.45µm**

Samplers Name: Tim Ross | **Samplers Signature:**

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
*1-1 thru 1-3	Carpet Adhesive		
*2-1 thru 2-3	Baseboard Adhesive		
3-1 thru 3-3	2x2 Textured Ceiling Panels		
4-1 thru 4-3	Skim Coating		
*5-1 thru 5-3	Black Mastic on FG		

Client Sample # (s): 1-1 - 8-3 **Total # of Samples:** 26

Relinquished (Client): **Date:** 11/1/2018 **Time:** 17:00

Received (Lab): **Date:** 11/2/18 **Time:** 9:15

Comments/Special Instructions:

② FAX 7956051310 76

Page 1 of _____ pages

Controlled Document – Asbestos COC – R10 – 05/09/2016

OrderID: 021808200

EMSL ANALYTICAL, INC.
LABORATORY · PRODUCTS · TRAINING

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*: 8200

EMSL ANALYTICAL, INC.
706 GRALIN ST.
KERNERSVILLE, NC 27284
PHONE: (336) 992-1025
FAX: (336) 992-4175

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
6-1 thru 6-5	Plaster Walls and Ceilings		
*7-1 thru 7-3	Wood Paneling Adhesive		
*8-1 thru 8-3	White Pipe Mastic on FG		

*Comments/Special Instructions:

Appendix K

Personnel Certifications

F&ME CONSULTANTS

SCDHEC ISSUED

Asbestos ID Card

Glynn M Ellen

		Expiration Date:
SUPERAHERA	**SA-00455**	**01/30/19**
CONSULTPD	**PD-00098**	**06/09/18**
CONSULTMP	**ASB-22641**	**01/29/19**
AIRSAMPLER	**AS-00079**	**01/30/19**

This card is nontransferable and considered invalid if loaned or given to another person for identification. This card will also be invalid if altered or defaced. This card is property of SCDHEC. It must be returned to the department if the holder's accreditation is revoked or if this card is invalidated. Any person performing regulated asbestos activities without current accreditation shall be subject to legal sanction. This card must be returned upon expiration and/or issuance of a new card.

YOU MUST HAVE THIS IDENTIFICATION CARD WITH YOU ON THE JOB.

For information of corrections contact:

SCDHEC – Asbestos Section
2600 Bull Street
Columbia, SC 29201
(803) 898-4289

Appendix L

Regulatory Summary

F&ME CONSULTANTS

Asbestos Regulatory Information

Renovations & Demolitions

Definitions

Renovation means altering a facility or one or more facility components in any way, including the stripping or removal of regulated asbestos-containing materials (RACM) from a facility component. "Remodeling" is considered renovation.

Demolition is wrecking or taking out any load-supporting structural member of a facility together and any related handling operations. Structural burns are prohibited by State Open Burning Regulations.

Applicability

Renovation and demolition of most facilities (including buildings, structures, and other installations), are subject to State and Federal asbestos regulations. Certain residential buildings may be exempt. Contact the SCDHEC Asbestos Section for additional information.

All asbestos-containing materials must be removed from a facility prior to demolition. Only the following asbestos-containing materials (ACM) may be left in place during demolition:

- ACM on a facility component that is encased in concrete or other similarly hard material and is adequately wet whenever exposed during demolition
- RACM that was not accessible for testing and was, therefore, not discovered until after demolition began and, as a result of the demolition, cannot be safely removed. If not removed for safety reasons, all exposed RACM and any asbestos-contaminated debris must be treated as regulated asbestos-containing waste material. Category I and Category II non-friable mastic, glue, and adhesive ACM that is not friable or in poor condition, and where the probability is low that the materials will become crumbled, pulverized, or reduced to powder during demolition operations.
- Category I and Category II non-friable mastic, glue, and adhesive ACM that is not friable or in poor condition, and where the probability is low that the materials will become crumbled, pulverized, or reduced to powder during demolition operations.

The facility owner and the renovation or demolition contractor are both responsible for ensuring compliance with these regulations.

Building Inspections

Before a facility or a portion of a facility is renovated or demolished, the owner/operator of the facility or renovation or demolition activity must ensure that the facility or portion of the facility being renovated or demolished has been thoroughly inspected for the presence of asbestos. The inspection must be performed by a person who has been trained and licensed as an Asbestos Building Inspector or management planner in accordance with State training and licensing requirements.

The inspector must identify, quantify, and assess the condition of all suspect asbestos-containing material, either friable or non-friable, on interior and exterior portions of the facility. The inspector must also comply with the procedures specified in Regulation 61-86.1 VI D. In addition, the inspector is required to prepare a written report detailing the findings of the inspection. At a minimum, the report must include information required in Regulation 61-86.1 VI C. A legible copy of the building inspection report must be provided to the Department prior to each demolition, and upon request for renovations. **(Note: "** BUILDING INSPECTIONS "**can be consulted for a detailed explanation of the aforementioned sampling and reporting protocols.)**

A building inspection will only be acceptable if performed **within three years** prior to the demolition or renovation. If an inspection report is more than three years old, then it must be confirmed and verified by a licensed Asbestos Building Inspector or Management Planner.

Friable Asbestos Containing Materials

If friable asbestos-containing materials (e.g., pipe insulation) are present, they must be removed prior to being disturbed during renovation or demolition activities. Removal (abatement) must be performed by trained, licensed persons using procedures detailed in State and Federal regulations.

A project design must be prepared for each asbestos abatement project involving the abatement of greater than 3,000 square feet, 1,500 linear feet and/or 656 cubic feet of RACM in a facility to be reoccupied. Such designs must be prepared by a person licensed by DHEC as an Asbestos Project Designer.

Non-Friable Asbestos Containing Materials

Please note that when it can reasonably be expected that non-friable materials will become friable during removal, that these materials must be considered friable from the beginning. If non-friable Asbestos Containing Materials (ACM) becomes friable during an abatement project, the removal becomes subject to the same requirements as friable materials, including training, licensing, notification, and work practices.

- Material should always be lowered to the ground carefully. Throwing or dropping non-friable ACM to the ground or into a truck will cause the material to become friable.
- Materials should be kept wet or misted with water during removal to minimize potential fiber release. **NOTE: The use of water is only a control measure and by no means prevents a material from becoming friable.**
- Once removed, materials may be placed in 6-mil polyethylene bags or drums or wrapped with 6-mil polyethylene sheeting. Additional water may be added to ensure thorough wetting, but do not add so much that the bag or wrapping breaks when lifted.
- Debris already on the ground should be wet and either collected manually or gathered with a shovel and bagged for disposal. These materials can be potential sources of airborne asbestos fiber releases.
- South Carolina Regulation 61-86.1 requires that containers (bags, drums, wrapped components) holding asbestos waste must be labeled with the following: **DANGER -**

CONTAINS ASBESTOS FIBERS - AVOID CREATING DUST - CANCER AND LUNG DISEASE HAZARD.

- Materials should be taken to a landfill as soon as possible but may be stored temporarily in a secure area subject to Departmental approval. Transport the materials so as to prevent them from leaking, spilling, or blowing off the vehicle.

- You should contact the landfill directly to make sure it will accept the material. You must obtain written approval from DHEC in advance for the disposal. You can get this approval by writing to the following address:

  South Carolina Department of Health and Environmental Control
  Attn: Bureau of Air Quality/Asbestos Section
  2600 Bull Street Columbia, SC 29201

  Be sure to include the following:

  1. the address where the material is to be removed;
  2. a brief description of the content (cement-like tiles, asphaltic shingles, etc.);
  3. the volume of waste in cubic yards or the area in square feet of material removed, and;
  4. the name and location of the landfill which has agreed to accept the waste.

  Please remember to include your name, return address, and phone number.

- **DO NOT BURN OR RECYCLE** any asbestos-containing or asbestos-contaminated materials.

The Occupational Safety and Health Administration (OSHA) has rules for workers affected by asbestos-containing materials. These rules must be complied with by all contractors and facility owners and include specific work practices, respiratory protection, and asbestos training requirements, **even for activities involving only non-friable asbestos-containing materials.** Contact the Department of Labor at (803) 896-7665 for details.

Notification of Renovations & Demolitions

Prior to removing regulated asbestos-containing materials, written notification must be submitted to DHEC (up to 10 working days in advance, depending on the amount of asbestos to be removed). The notification must include certain required items of information about the owner, the contractor, the facility, and the asbestos removal project. Required fees must be submitted along with the notification. You must obtain a permit from the Department prior to the renovation activity.

Prior to the demolition of any regulated facility, written notification must be submitted to DHEC *at least 10 working days* in advance **even if a building inspector determines that asbestos is not present at the facility.** The notification must include certain required items of information about the owner, the contractor, the facility, and the demolition project. Required fees and a copy of the building inspector's report must be submitted along with the notification of demolition. You must obtain a permit from the Department prior to the demolition activity.

Disposal

Never burn any asbestos-containing waste material.

Non-asbestos-containing demolition debris and debris which contains only non-regulated roofing or flooring may be disposed of at a DHEC-approved disposal site for cellulosic or inert waste. Waste consolidation activities involving grinding, cutting, or compacting of non-friable asbestos-containing materials will subject these materials to more stringent State and Federal asbestos disposal regulations.

Regulated asbestos waste must be handled by properly licensed asbestos abatement personnel and disposed of at a landfill permitted to accept regulated asbestos waste. A list of approved landfills may be obtained from the Asbestos Section.

Building Inspection Report Directions

As required by the National Emission Standard for Hazardous Air Pollutants (NESHAP) and Regulation 61-86.1, an owner/operator shall ensure that a building inspection, to detect the presence of asbestos-containing material (ACM), has been performed prior to any renovation or demolition activity at a regulated facility.

Under Regulation 61-86.1, Section VI.A.6., an inspection cannot have been performed more than three years prior to a renovation or demolition activity. If more than three years have elapsed since the most recent inspection, the previous inspection shall be confirmed and verified by a licensed building inspector and/or management planner.

Regulation 61-86.1 requires that all inspections be performed by persons trained and licensed as either a building inspector and/or management planner. In order to be licensed in these disciplines, persons must have successfully completed a DHEC approved initial training course specific to inspecting for ACM in a building and/or a course specific to management planning for ACM in a building. Persons must also have taken and passed an examination at the end of the course with a score of 70 percent or above.

In performing inspections, Regulation 61-86.1 requires that a building inspector and/or management planner comply with the requirements of Section VI, Asbestos Building Inspection Requirements. An inspection shall include samples from suspect friable and non-friable ACM on interior and exterior portions of a facility or its facility components.

In performing inspections, Regulation 61-86.1 requires that a building inspector and/or management planner follow specific sampling procedures. According to Section IV.B.3.a of the regulation, a building inspector and/or management planner shall comply with the procedures specified in **40 CFR 763.86** in determining sampling locations and the number of representative samples to be collected. An inspection shall include samples from suspect friable and non-friable ACM on interior and exterior portions of a facility or its facility components.

Under 40 CFR Part 763.86, suspect ACM are divided into three categories: surfacing materials, thermal system insulation (commonly referred to as TSI), and miscellaneous materials.

Regulation 61-86.1, Section VI contains sampling procedures specific to each category of material.

Surfacing material includes, but is not limited to, joint compound, plaster, and painted, troweled on, or spray-applied textured material. To remain in compliance with Regulation 61-86.1, surfacing materials on exterior and interior portions of a facility shall be sampled according to procedures outlined in Regulation 61-86.1, Section VI.D.1. (a)-(c):

- A licensed asbestos inspector shall collect, in a statistically random manner, a minimum of three bulk samples from each homogeneous area of any surfacing that is not assumed to be ACM, and shall collect the samples as follows:
    - At least three bulk samples shall be collected from each homogeneous area that is 1,000 or fewer square feet (sf) or linear feet (Lf) in size.
    - At least five bulk samples shall be collected from each homogeneous area that is greater than 1,000 but fewer than or equal to 5,000 sf or Lf.
    - At least seven bulk samples shall be collected from each homogeneous area that is greater than 5,000 sf or Lf.

Thermal System Insulation (TSI) is any material that is applied to pipes, fittings, boilers, breeching, tanks, ducts, or other facility components for the purpose of preventing heat loss or gain, water condensation, or for other purposes. ***Miscellaneous Material*** is any material that is not considered a surfacing material or thermal system insulation and includes, but is not limited to, flooring, roofing, mastics, gaskets, cementitious materials, caulkings, ceiling tiles, fire doors, wall boards, and flexible duct connections. To remain in compliance with Regulation 61-86.1, TSI and miscellaneous materials on exterior and interior portions of a facility shall be sampled in accordance with procedures outlined in Regulation 61-86.1, Section VI.D.2:

- A licensed asbestos inspector shall collect, in a statistically random manner, at least three bulk samples from each homogeneous area of TSI and any miscellaneous material that is not assumed to be ACM.
- In accordance with ASTM E2356, and any subsequent amendments and editions, negative results for non-friable organically bound material (NOB) shall be verified with at least one TEM analysis.
- NOBs include flooring, roofing, mastics, adhesives, caulks, and glazing.
- If an accredited inspector has determined the thermal system insulation to be fiberglass, foam glass, rubber, or other non-suspect material, then bulk samples are not required.

Regulation 61-86.1, Section VI.C requires that a building inspector and/or management planner prepare a written asbestos building inspection report to include the following:

- A title page denoting:
    1. The client's name, company, address, and telephone number, and the name and exact location of the facility inspected;
    2. the date the inspection was performed;
    3. the date the inspection report was written; and
    4. the printed name and telephone number of the inspector(s), and his or her affiliated company name, address, and telephone number.

- A cover letter to the building owner or owner's representative that describes the purpose of the inspection; a general synopsis of the inspection and results; and the name, title, and signature of the inspector(s) and report writer, if different.
- A detailed narrative of the physical description of the building or part of the building affected by the renovation or demolition operation that includes:
    1. The square footage of the building or part of the building affected by the renovation or demolition operation;
    2. The building materials used in the construction of the exterior, roof, interior, and basement or crawlspace of the building affected by the demolition or affected by the renovation materials operation;
    3. An estimated or exact quantity (square or linear feet) for all suspect materials whether sampled for or assumed to be asbestos that may be affected by the renovation or demolition operation;
    4. Also include a description of non-suspect materials excluding: glass, metals, kiln brick, cement, fiberglass, concrete, pressed wood, cinder block, and rubber.
- An executive summary that details:
    1. The type of suspect ACM (e.g., TSI, floor tile, mastic), total square or linear footage, and the total number of samples collected for each separate homogenous area affected by the renovation or demolition operation;
    2. The date of the inspection, type, condition, quantity, sample results, and exact location of ACM positively identified or assumed to be ACM in the part of the building affected by the renovation or demolition operation;
    3. A list of the homogeneous areas identified;
    4. Whether the material is accessible for the building or part of the building affected by the renovation or demolition operation; and (5) The material's potential for disturbance for the building or part of the building affected by the renovation or demolition operation.
- For renovation and demolition operations, the inspector's determination that ACM is friable or non-friable.
- Except when suspect ACM materials are assumed to be asbestos, include a complete, clear, legible copy of all laboratory bulk sample results.
- Clear, legible drawings and/or photographs to clarify the scope of the renovation or demolition operation. Illustrate the exact location of each sample collected. For facilities that involve a trade secret or confidential component or an affected area process, a request for a variance may be submitted.
- The printed name and signature of each accredited inspector who collected the samples, and a clear legible copy of his or her DHEC issued asbestos building inspector or management planner license.

Things to Note:

- At no time will negative assumptions about a suspect material's content be acceptable. There are only two acceptable options:
    1. Positive assumptions of suspect materials or
    2. Sampling of suspect materials per the procedures specified in 40 CFR 763.86
- A homogenous area is considered not to contain ACM only if the results of all samples required to be collected from the area are one percent or less.
- Bulk samples shall not be composited for analysis.

- In a multi-unit building, each separate room in each part of the building or areas affected by the renovation or demolition operation shall be inspected to confirm and quantify ACM homogeneous areas for sampling purposes.
- DHEC will not accept an asbestos building inspection or written report for any structure from an employee of an abatement company also involved in the removal of asbestos-containing materials from that structure, unless the licensed inspector is an employee of an entity regulated under Regulation 61-86.1, Section XX, Industrial Manufacturing and Electrical Generation Facilities.
- An asbestos building inspector shall not participate in the analysis of the bulk samples he or she has collected.
- Destructive sampling techniques shall be utilized.
- Material Safety Data Sheets (MSDS), statements from the manufacturer, and architecture signoff will not be accepted as proof that a building product contains no asbestos, except in cases where the owner can verify the direct correlation of the building product to the MSDS, statements from the manufacturer, and/or architecture signoff documents. DHEC reserves the right to reject documentation that it deems unacceptable.

Appendix M

Abatement Project Forms

F&ME CONSULTANTS

D H E C

PROMOTE PROTECT PROSPER

ASBESTOS ABATEMENT PROJECT LICENSE APPLICATION

BUREAU OF AIR QUALITY • ASBESTOS SECTION • 2600 BULL STREET • COLUMBIA • SC • 29201

TYPE OF OPERATION: ☐ Standard Removal ☐ Emergency Removal ☐ Enclosure ☐ Encapsulation ☐ Cleanup ☐ Disposal

FOR OFFICE USE Postmark/Received:	Original ☐ / Revised ☐ / Cancellation ☐ (check one)	Project License I.D. (For Revisions/Cancellations):

I. FACILITY OWNER: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTACT PERSON: _____ PHONE: ( ) _____

II. REMOVAL CONTRACTOR: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTACT PERSON: _____ PHONE: ( ) _____

E-MAIL ADDRESS: _____ E-MAIL PERMIT ☐ OR MAIL PERMIT ☐

FEDERAL I.D. NUMBER: _____

DHEC CONTRACTOR LICENSE NO. (If applicable): _____ EXPIRATION DATE: _____

III. FACILITY NAME: _____

STREET ADDRESS: _____

CITY: _____ STATE: _____ COUNTY: _____

SITE (ROOM, FLOOR, WING, UNIT, MACHINE, ETC.): _____

BUILDING SIZE: _____ NO. OF FLOORS: _____ AGE IN YEARS: _____

PRESENT USE: _____ PRIOR USE: _____ FUTURE USE: _____

IV. PROCEDURES, INCLUDING ANALYTICAL METHOD IF APPROPRIATE, USED TO DETECT THE PRESENCE OF ASBESTOS MATERIAL:

FACILITY OR FACILITY COMPONENT SURVEYED BY (INSPECTOR NAME): _____

COMPANY: _____ PHONE: ( ) _____

DHEC LICENSE NUMBER: _____ EXPIRATION DATE: _____

V. PROJECT DESIGN PERFORMED BY (IF APPLICABLE): _____

COMPANY: _____ PHONE: ( ) _____

DHEC LICENSE NUMBER: _____ EXPIRATION DATE: _____

VI. ASBESTOS-CONTAINING MATERIALS (ACM) ***TO BE REMOVED ONLY:***

TYPE (TSI, SURFACING, FLOORING, ROOFING, ETC.)	**AMOUNT** (SQUARE FEET, LINEAR FEET, CUBIC FEET)	**CONDITION** (CIRCLE ONE)
		☐ FRIABLE ☐ NON-FRIABLE
		☐ FRIABLE ☐ NON-FRIABLE
		☐ FRIABLE ☐ NON-FRIABLE
		☐ FRIABLE ☐ NON-FRIABLE

VII. SCHEDULED DATES OF REMOVAL: START DATE: _____ COMPLETION DATE: _____

WORK DAYS: _____ WORK HOURS: _____

APPLICATIONS MUST BE SUBMITTED WITH FEES PRIOR TO THE SCHEDULED START DATE AS FOLLOWS:

NESHAP PROJECTS: 10 WORKING DAYS
SMALL PROJECTS: 4 WORKING DAYS
MINOR PROJECTS: 2 WORKING DAYS

FEE SCHEDULE FOR FRIABLE ASBESTOS-CONTAINING MATERIALS:

10 CENTS PER SQUARE FOOT OR LINEAR FOOT
MINIMUM FEE OF $25.00
MAXIMUM FEE OF $1000.00

Non-Friable (NESAP-sized) Projects: 4 working days. No fee for non-friable ACM.

For additional information concerning regulatory requirements call or visit our Web site at http://www.scdhec.gov/environment/baq/asbestos.aspx

VIII. DESCRIPTION OF PLANNED ABATEMENT WORK & METHOD(S) TO BE USED:

IX. DESCRIPTION OF WORK PRACTICES & ENGINEERING CONTROLS TO BE USED TO PREVENT EMISSIONS OF ASBESTOS AT THE RENOVATION SITE:

X. WASTE TRANSPORTER #1: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTACT PERSON: _____ PHONE: (_____)_____

WASTE TRANSPORTER #2: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTACT PERSON:_____ PHONE: (_____)_____

XI. WASTE DISPOSAL SITE: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTACT PERSON: _____ PHONE: (_____)_____

TEMPORARY ASBESTOS STORAGE CONTAINMENT AREA LICENSE NUMBER (IF APPLICABLE): _____

XII. DESCRIPTION OF EMERGENCY REMOVAL (**PLEASE ATTACH A LETTER FROM THE FACILITY OWNER EXPLAINING THE NATURE OF THE EMERGENCY**)

DATE & HOUR OF EMERGENCY (MM/DD/YY): _____

DESCRIPTION OF SUDDEN, UNEXPECTED EVENT:

_____

EXPLANATION OF HOW THE EVENT CAUSED UNSAFE CONDITIONS AND/OR WOULD CAUSE EQUIPMENT DAMAGE AND/OR AN UNREASONABLE FINANCIAL BURDEN:

XIII. DESCRIPTION OF PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED ASBESTOS IS FOUND OR PREVIOUSLY NON-FRIABLE ASBESTOS MATERIAL BECOMES CRUMBLED, PULVERIZED OR REDUCED TO POWDER:

XIV. *I CERTIFY THAT AN INDIVIDUAL TRAINED IN THE PROVISIONS OF REGULATION (40 CFR PART 61, SUBPART M) WILL BE ON-SITE DURING THE RENOVATION AND EVIDENCE THAT THE REQUIRED TRAINING HAS BEEN ACCOMPLISHED BY THIS PERSON WILL BE AVAILABLE FOR INSPECTION DURING NORMAL BUSINESS HOURS.*

_____/_____

(SIGNATURE OF OWNER/OPERATOR) (DATE)

XIV. *I CERTIFY THAT THE ABOVE INFORMATION IS CORRECT.*

_____/_____

(SIGNATURE OF OWNER/OPERATOR) (DATE)

D H E C
PROMOTE PROTECT PROSPER

DEMOLITION LICENSE APPLICATION

BUREAU OF AIR QUALITY • ASBESTOS SECTION • 2600 BULL STREET • COLUMBIA • SC • 29201

TYPE OF OPERATION: ☐ Total Demolition ☐ Partial Demolition ☐ Ordered Demolition

FOR OFFICE USE Postmark/Received:	Original/Revised/Cancellation (circle one) ☐ ☐	Project License I.D. (For Revisions/Cancellations):

I. FACILITY OWNER: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTACT PERSON: _____ PHONE: (_____) _____

II. IS ASBESTOS PRESENT IN THE FACILITY?: YES ☐ / NO ☐ (check one)

III. DEMOLITION CONTRACTOR: _____ FEDERAL ID NO.: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTACT PERSON: _____ PHONE: (_____) _____

E-MAIL ADDRESS: _____ E-MAIL PERMIT ☐ OR MAIL PERMIT ☐

FEDERAL I.D. NUMBER: _____

ASBESTOS REMOVAL CONTRACTOR (If applicable): _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTACT PERSON: _____ PHONE: (_____) _____

IV. FACILITY NAME: _____

STREET ADDRESS: _____

CITY: _____ STATE: _____ COUNTY: _____

SITE (ROOM, FLOOR, WING, UNIT, MACHINE, ETC.): _____

BUILDING SIZE: _____ NO. OF FLOORS: _____ AGE IN YEARS: _____

PRESENT USE: _____ PRIOR USE: _____ FUTURE USE: _____

V. PROCEDURES, INCLUDING ANALYTICAL METHOD IF APPROPRIATE, USED TO DETECT THE PRESENCE OF ASBESTOS MATERIAL:

FACILITY OR FACILITY COMPONENT SURVEYED BY (INSPECTOR NAME): _____

COMPANY: _____ PHONE: (_____) _____

DHEC LICENSE NUMBER: _____ EXPIRATION DATE: _____

VI. NON-FRIABLE MASTIC, GLUE, AND ADHESIVE ASBESTOS-CONTAINING MATERIALS ***REMAINING IN PLACE DURING DEMOLITION*** *(IF APPLICABLE):*

TYPE (MASTIC, GLUE, AND ADHESIVE)	**AMOUNT** (SQUARE FEET)

VII. SCHEDULED DATES OF DEMOLITION (YOU MUST SPECIFY DATES):

START DATE: _____ COMPLETION DATE: _____

WORK DAYS: _____ WORK HOURS: _____

- ***Applications must be mailed along with a $50.00 fee (payable to SCDHEC) at least 10 working days prior to the scheduled start date. Faxes will not be accepted.***
- ***A copy of an asbestos survey report (no older than 3 years) must accompany the application.***

For additional information concerning regulatory requirements call or visit our Web site at http://www.scdhec.gov/environment/baq/asbestos.aspx

VIII. DESCRIPTION OF PLANNED DEMOLITION METHOD(S) TO BE USED:

☐ BULLDOZER	☐ LOADER	☐ WRECKING BALL	☐ MANUAL	☐ BURNING	☐ IMPLOSION/EXPLOSION

IF OTHER PLEASE DESCRIBE:

IX. DESCRIPTION OF WORK PRACTICES & ENGINEERING CONTROLS TO BE USED TO PREVENT EMISSIONS OF ASBESTOS AT THE DEMOLITION SITE:

X. WASTE TRANSPORTER #1: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTACT PERSON: _____ PHONE: (_____) _____

WASTE TRANSPORTER #2: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTACT PERSON: _____ PHONE: (_____) _____

XI. WASTE DISPOSAL SITE: _____

MAILING ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTACT PERSON: _____ PHONE: (_____) _____

XII. IF DEMOLITION ORDERED BY GOVERNMENT AGENCY, PLEASE IDENTIFY THE AGENCY BELOW: (PLEASE ATTACH A COPY OF THE ORDER)

NAME: _____ TITLE: _____

AUTHORITY: _____

DATE OF ORDER (MM/DD/YY): _____ DATE ORDERED TO BEGIN(MM/DD/YY): _____

XIII. DESCRIPTION OF PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED ASBESTOS IS FOUND OR PREVIOUSLY NONFRIABLE ASBESTOS MATERIAL BECOMES CRUMBLED, PULVERIZED, OR REDUCED TO POWDER:

XIV. *I CERTIFY THAT AN INDIVIDUAL TRAINED IN THE PROVISIONS OF REGULATION (40 CFR PART 61, SUBPART M) WILL BE ON-SITE DURING THE DEMOLITION INVOLVING RACM AND EVIDENCE THAT THE REQUIRED TRAINING HAS BEEN ACCOMPLISHED BY THIS PERSON WILL BE AVAILABLE FOR INSPECTION DURING NORMAL BUSINESS HOURS.*

_____/_____
(SIGNATURE OF OWNER/OPERATOR) (DATE)

XV. *I CERTIFY THAT THE ABOVE INFORMATION IS CORRECT.*

_____/_____
(SIGNATURE OF OWNER/OPERATOR) (DATE)

- ***Applications must be mailed along with a $50.00 fee (payable to SCDHEC) at least 10 working days prior to the scheduled start date. Faxes will not be accepted.***
- ***A copy of an asbestos survey report (no older than 3 years) must accompany the application.***

For additional information concerning regulatory requirements call or visit our Web site at http://www.scdhec.gov/environment/baq/asbestos.aspx

D H E C
PROMOTE PROTECT PROSPER

Asbestos Waste Shipment Record

1. **SCDHEC ASBESTOS ABATEMENT PROJECT LICENSE:**

Generator Information

2. Waste Generator/Owner Name & Address:	Work Site Name & Physical Address:	Waste Generator/Owner Telephone Number ( )
3. Abatement Contractor Name & Address:		Abatement Contractor Telephone Number ( )
4. Name of waste disposal site (WDS), mailing address, and physical site location:		WDS Telephone Number: ( )

5. Description of Waste Materials (please circle): Friable (Regulated) / Nonfriable (Nonregulated)	6. Bags of Containers: No. Type _____ Drums _____ Bags _____ Bulk Load	7. Total Quantity: m3 (yd3)

8. Special handling instructions & additional information:

9. Generator's/Contractor's Certification: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled. The contents are in all respects in proper condition for transport by highway according to applicable international and government regulations.

Print Name:	Signature:	Date:

Transporter Information (Acknowledgment of Receipt of Materials):

10. Name, title, address, telephone number:	Signature:	Date:
11. Name, title, address, telephone number:	Signature:	Date:

Disposal Site Operator

12. Discrepancy: Bags or Containers Total Quantity

13. Waste Disposal Site Owner or Operator certification of receipt of asbestos materials covered by this manifest except as noted in item 11.

Print Name:	Signature:	Date:

Please forward a completed copy of this record to: SCDHEC, Bureau of Air Quality, Asbestos Section, 2600 Bull Street, Columbia, SC 29201
(803) 898-4389 office. (803) 898-4281 fax.

F&ME CONSULTANTS

LIMITED LEAD-BASED PAINT INVESTIGATION REPORT

USC CAROLINA COLISEUM ATHLETICS DEPARTMENT'S LAUNDRY RELOCATION 701 ASSEMBLY STREET COLUMBIA, SOUTH CAROLINA 29201

PREPARED FOR:

UNIVERSITY OF SOUTH CAROLINA

Ms. Ann G. Derrick
Project Manager
Facilities Planning and Construction
1300 Pickens Street
Columbia, South Carolina 29208

PREPARED BY:

F&ME Consultants
1825 Blanding Street
Columbia, South Carolina 29201

November 20, 2018

F&ME Project No.: E5700.360

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This executive summary is intended as an overview for the convenience of the reader. This report should be reviewed in its entirety prior to making any decisions regarding this project.

F&ME Consultants Inc. (F&ME) has completed a Limited Lead-Based Paint (LBP) Investigation within the Carolina Coliseum at the University of South Carolina in Columbia, SC. The investigation was requested as a component of a planned relocation of the athletics department's laundry facilities. Therefore, this investigation covered interior building components within those areas that may be impacted by the planned renovations. Appendix A – Site Vicinity Map is provided to show the location of the building. Appendix B – General Building Plan, is provided to show the buildings lay-out and locations of XRF scans taken in the areas of the planned renovations.

Per an agreed upon scope of work, this limited LBP Investigation was conducted to identify, analyze, and assess the condition of any LBP or coated interior building components which may be affected by the planned renovations. Additionally, F&ME agreed to make recommendations regarding proper handling and/or disposal methods if any LBP or coatings were identified. This investigation includes both a visual evaluation of the physical condition of painted materials as well as quantitative testing of random surfaces using a Heuresis X-Ray Fluorescence (XRF) Portable Analyzer. The XRF documents the concentration of lead, if any, in the overall paint or coating. Building components were scanned with a Heuresis XRF analyzer (Model # Pb200i, Serial #1888) with a limit of detection (LOD) of 0.1 mg/cm^2. This limited LBP investigation was performed on October 31, 2018.

LBP is regulated by multiple government agencies, and each requires different response actions when the concentration of lead exceeds specified thresholds. The Occupational Safety and Health Administration (OSHA) regulates worker exposure to lead dust, and as a result considers materials with any lead content to be a potential hazard. Additionally, South Carolina Department of Health and Environmental Control (SCDHEC) requires some waste materials to be disposed of at specific disposal facilities which are able to manage this waste. Appendix C – XRF Data, is provided to present the data in a user-friendly format. Items in red text contain lead in concentrations regulated by SCDHEC and these materials must be addressed upon disposal. Items in blue and red text contain lead in concentrations that must be considered a potential for worker exposure by OSHA.

The results from the XRF quantitative testing indicate that of the random building components that were scanned, no lead is present in paint and/or coatings in concentrations greater than or equal to ($\geq$) 0.7 mg/cm^2. However, some components have lead concentrations less than 0.7 mg/cm^2 and therefore could be a concern under OSHA regulations. These items are highlighted in blue on the XRF Data table located in Appendix C.

We appreciate the opportunity to assist you in this project. If you have any questions or require additional information, please feel free to contact our office at (803) 254-4540.

Sincerely,

F&ME CONSULTANTS

Jeffrey S. Leary
S.C. Lead-Based Paint Inspector
EPA Certification No. SC-I-18721-3 (Exp. 07/29/21)

Glynn M. Ellen
Environmental Department Manager

2. LEAD-BASED PAINT BACKGROUND INFORMATION

Housing and Urban Development (HUD) defines "LBP" as any coating that has a lead concentration of 1.0 milligrams of lead per square centimeter (1.0 mg/cm^2) or greater, or if the lead concentration is greater than one half of a percent (> 0.5%) by weight. The Consumer Product Safety Commission (CPSC) currently considers paint to be lead-containing if the concentration of lead exceeds 90 ppm (0.009% by weight). In 1978, the CPSC banned the sale of LBP to consumers, and banned its application in areas where consumers have direct access to painted surfaces. Both the CPSC and HUD definitions of lead-containing paint are aimed at protecting the general population from exposure to lead in the residential setting.

In contrast, the mission of OSHA with respect to lead-containing paint is to protect workers during construction activities that may generate elevated airborne lead concentrations. OSHA states that construction work (including renovation, maintenance, and demolition) carried-out on structures coated with paint having lead concentrations lower than the HUD or CPSC can still result in airborne lead concentrations in excess of regulatory limits. For this reason, OSHA has not defined lead-containing paint, but states that paint having any measurable level of lead may pose a substantial exposure hazard during construction work, depending upon the work performed. Therefore, in these situations, OSHA guidelines and safety procedures should be followed. By OSHA standards and regulations, the employer shall ensure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50 ug/m^3) averaged over an 8-hour period.

Additionally, SCDHEC requires the use of specific waste disposal sites if materials contain lead concentrations greater than or equal to (≥) 0.7 mg/cm^2. It is imperative that these regulations be considered if any present or future renovations and/or demolition activities will impact LBP-containing building materials or equipment. Due to the anticipated impact on the building's components from the planned renovation activities, SCDHEC lead disposal requirements were used as the threshold for this Investigation.

3. INTRODUCTION

It is F&ME's understanding that the objective of this limited lead-based paint investigation was to identify and assess LBP that may be encountered and/or impacted by renovation activities in the areas of the planned relocation of the athletics department's laundry facilities. The areas of this limited investigation included the following rooms/locations: Room 201A, Stairs ST02, Ramp 215A, Room 203, and Hallway H101. Where LBP or coatings have been identified, recommendations regarding proper handling and/or disposal methods are provided. The field investigation was performed on October 31, 2018.

The Carolina Coliseum is located on the University of South Carolina campus in Columbia, SC. The exterior of the subject building is constructed with concrete walls with an exterior applied texturing. Interior finishes of the structure are concrete floors, drywall walls and ceiling, masonry block walls, concrete ceilings with drop ceilings, vinyl baseboards, and carpeting. (See Appendix A – Site Vicinity Map, for the location of the structure. See Appendix B –General Building Plan, for a layout of the building).

Photo 1. University of South Carolina – Carolina Coliseum, Columbia, SC.

4. INVESTIGATION RESULTS

F&ME's Limited LBP Investigation sampling protocol consisted of randomly selecting interior building components that may be impacted during the planned renovations and scanning these components with a Heuresis X-Ray Fluorescence (XRF) Portable Analyzer (Model # Pb200i, Serial #1888). The components scanned with the XRF include the following: walls, ceiling, door and casing, columns, floors, handrails, pipe, overhead door, trash compactor, etc.

The results from the XRF quantitative testing indicate that of the random selected building components that were scanned, no lead is present in paint and/or coatings in concentrations greater than or equal to (≥) 0.7 mg/cm^2. However, some components have lead concentrations less than 0.7 mg/cm^2 and therefore could be a concern under OSHA regulations. These items are highlighted in blue on the XRF Data Table located in Appendix C.

For more information regarding the specific descriptions and locations of the items that were scanned, refer to the Appendix C – XRF Data. Appendix D - Personnel Certification, is included to show F&ME qualifications with regards to LBP Investigations.

5. RECOMMENDATIONS

The results, conclusions and recommendations from this investigation are representative of the conditions observed at the site on the date of the field inspection. F&ME does not assume responsibility for any changes in conditions or circumstances that occur after the inspection. This report has been prepared exclusively for USC and shall not be disseminated in whole or part to other parties without prior consent from USC or F&ME Consultants, Inc. No other environmental issues were addressed as part of this report.

No lead-based paint and/or coating was identified on the random building components that were scanned at concentrations greater than or equal to (≥) 0.7 mg/cm^2. However, some components have lead

concentrations less than 0.7 mg/cm^2 and could be a concern under OSHA regulations. Therefore, OSHA regulations and procedures should be followed when impacting these components.

As stated previously, OSHA regulates any measurable level of lead, as it may pose a substantial exposure hazard to workers. Therefore, in these situations, OSHA regulations and safety procedures should be followed. These regulations also list the proper personal protective equipment to be used by the workers disturbing the LBP items and the requirements for personal air monitoring. OSHA's exposure action level (AL) for lead, regardless of respirator use, is an airborne concentration of 30µg/cm^3, averaged over an eight-hour period. The action level (AL) is the level at which an employer must begin specific compliance activities as outlined in OSHA's lead standards. By OSHA standards and regulations, the employer shall ensure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50 µg/m^3) averaged over an 8-hour period which is the permissible exposure level (PEL).

Should any hidden and/or inaccessible components suspected to have LBP be encountered during the renovation activities, the contractor performing the work is advised to stop work, follow proper procedures and precautions relating to LBP, and contact F&ME Consultants at (803) 254-4540 for an immediate response action.

If any lead components are found, it is important to ensure that the debris generated from the renovation activities is handled and disposed of appropriately. The proper handling and disposal procedures depend on the type of substrate (e.g., metal, wood, masonry block, etc.). In order to reduce and/or eliminate the generation of lead-containing dust, and residue, it is recommended that cutting, sanding and grinding be kept to a minimum, and to the extent practicable, the substrate materials should be removed intact.

Components found to contain lead should be handled appropriately. It is recommended that work tasks which require grinding, sanding, cutting torch, or other disturbance of the LBP surfaces identified herein be performed in accordance with federal regulations pertaining to worker protection from exposure to LBP. When lead containing items are disturbed or begin to decay they become a concern with regard to human health and the environmental. The typical routes of exposure to lead are through the inhalation or ingestion of lead-contaminated materials. Minimal risk of exposure exists where the lead-containing paint and coating are intact (e.g., has not been aerosolized, free of chipping or flaking, etc.).

SCDHEC regulates the proper disposal of LBP and associated debris. SCDHEC defines two types of LBP debris. The first is LBP *waste*, which is defined as material such as wood, brick and metal that is painted with LBP. The other is LBP *residue* which is defined as residue that is generated from the removal (e.g., scraped, chipped, sandblasted, or chemical) of LBP from a structure. LBP *waste* that comes from a commercial or residential facility may be disposed of in either a class 2 or 3 landfill, while LBP *residue* from a commercial facility must have a toxicity characteristic leaching procedure (TCLP) analysis to determine the lead content. TCLP analysis is used to determine whether or not a waste is a characteristic hazardous waste due to leachability under the South Carolina Hazardous Waste Management Regulations. LBP *residue* with a TCLP analysis result greater than or equal to five milligrams per liter ($\geq$ 5 mg/l) lead must be disposed of in a Subtitle C landfill (Hazardous Waste).

However, LBP *residue* from a commercial facility with a TCLP analysis result less than five milligrams per liter (< 5 mg/l) lead is required to be disposed of in a Class 3 landfill.

We sincerely appreciate the opportunity to be of service to USC on this project. If you have any questions regarding the information presented herein, please contact our office at (803) 254-4540.

APPENDICES

Appendix A – Site Vicinity Map

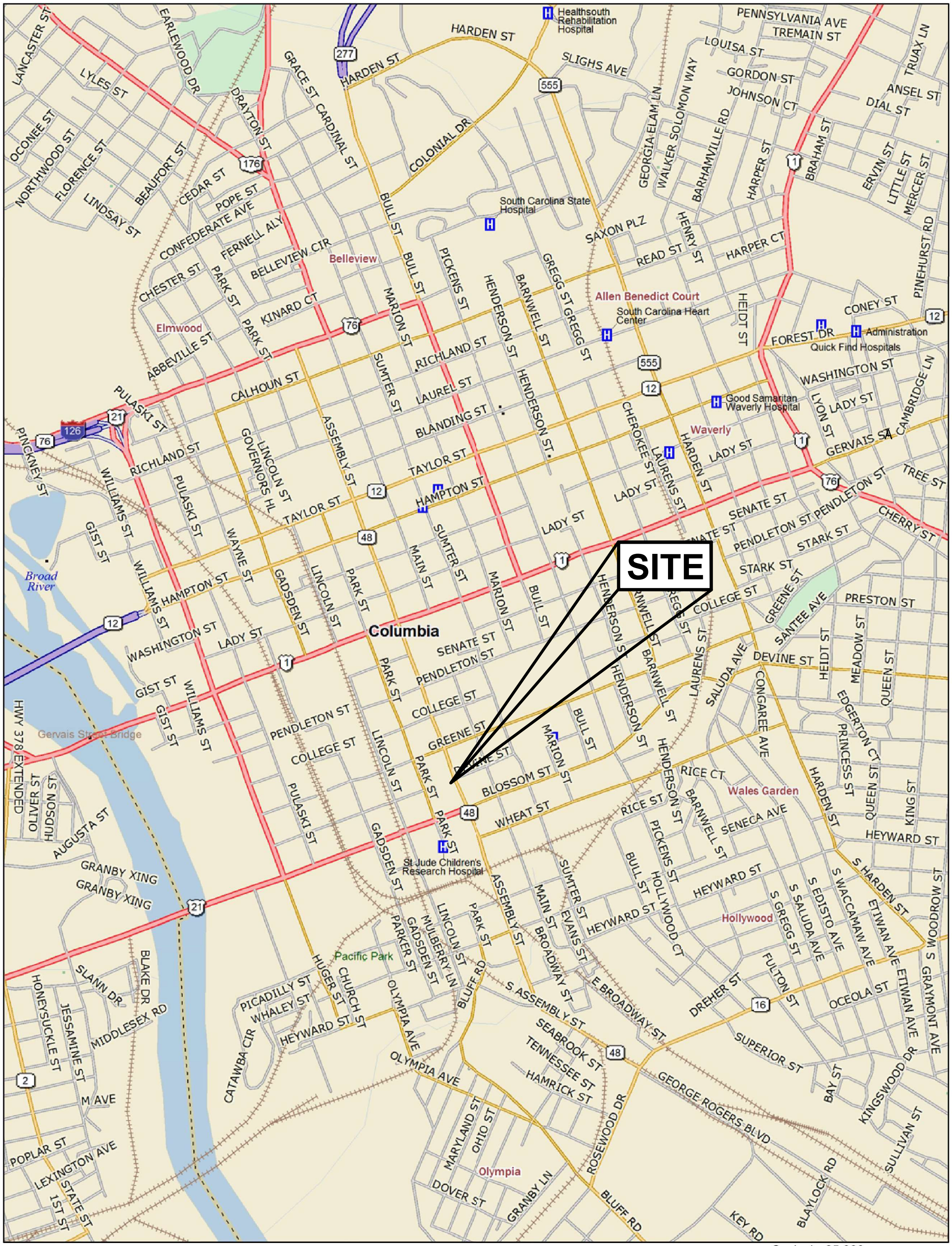
Appendix B – General Building Plan

Appendix C – XRF Data

Appendix D – Personnel Certification

Appendix A

Site Vicinity Map



Data use subject to license.

Scale 1 : 25,000

0 600 1200 1800 2400 3000 ft
0 200 400 600 800 1000 m

1" = 2,083.3 ft Data Zoom 13-0

FIGURE NUMBER:	F&ME CONSULTANTS PROJECT NUMBER:				
1	E5700.36	**LIMITED LBP INVESTIGATION** **Carolina Coliseum - Laundry Facility Relocation** Columbia, South Carolina **Site Vicinity Map** Prepared for: University of South Carolina 1301 Pickens Street Columbia, SC 29201	F&ME CONSULTANTS 1825 Blanding Street Columbia ,SC 29201	ORIGINAL: November 15, 2018 REVISIONS: 1 2 3 SCALE: AS SHOWN	DRWN. BY: GME CHKD. BY: GME APPR. BY: GME NOTES:

Appendix B

General Building Plan

F&ME
CONSULTANTS

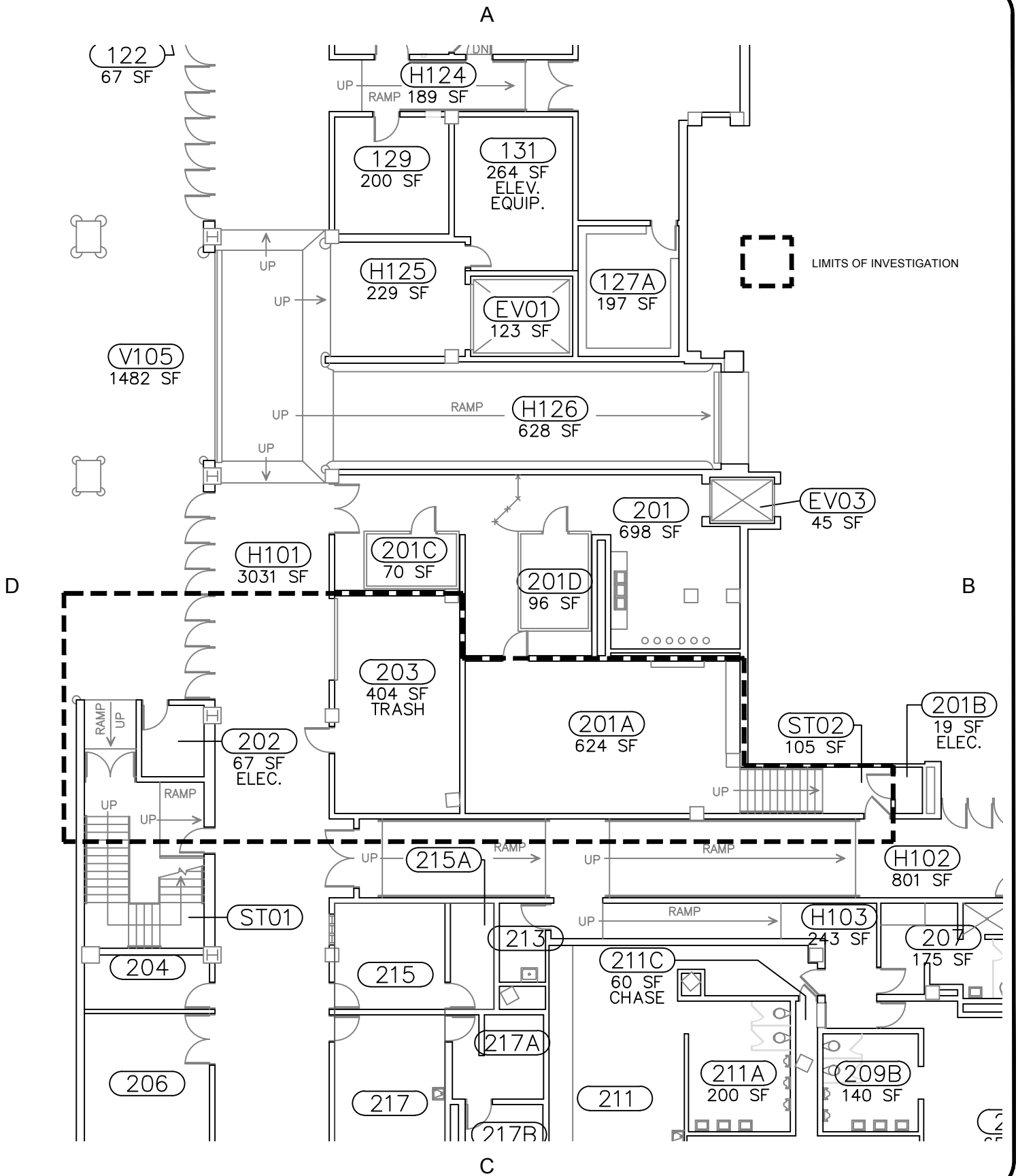


FIGURE NUMBER:	F&ME CONSULTANTS PROJECT NUMBER:				
2	E5700.36	**LIMITED LBP INVESTIGATION** **Carolina Coliseum - Laundry Facility Relocation** Columbia, South Carolina **General Building Plan** Prepared for: University of South Carolina 1301 Pickens Street Columbia, SC 29201	F&ME CONSULTANTS 1825 Blanding Street Columbia ,SC 29201	ORIGINAL: November 15, 2018 REVISIONS: 1 2 3 SCALE: 1/16" = 1.0'	DRWN. BY: GME CHKD. BY: GME APPR. BY: GME NOTES:

Appendix C

XRF Data

Appendix C – Summary of XRF Data

Date Scanned: 10/31/18

Reading #	Pb (mg/cm^2)	Room	Component	Substrate	Side	Condition	Color
1	0.93		Calibrate				
2	0.93		Calibrate				
3	0.93		Calibrate				
4	LOD	201A	Wall	Cinder Block	C	Intact	Cream
5	LOD	201A	Wall	Cinder Block	B	Intact	Cream
6	LOD	201A	Wall	Plaster	B	Intact	Black
7	LOD	201A	Wall	Plaster	B	Intact	Black
8	LOD	ST02	Ceiling	Plaster	B	Intact	Cream
9	LOD	ST02	Ceiling	Plaster	B	Intact	Cream
10	LOD	ST02	Door	Metal	C	Intact	Grey
11	LOD	ST02	Door	Metal	C	Intact	Grey
12	0.13	ST02	Door Casing	Metal	C	Intact	Black
13	0.5	ST02	Door Casing	Metal	C	Intact	Black
14	0.11	ST02	Door Jamb	Metal	C	Intact	Cream
15	LOD	ST02	Door Jamb	Metal	A	Intact	Grey
16	LOD	ST02	Door Casing	Metal	A	Intact	Grey
17	LOD	ST02	Door	Metal	A	Intact	Grey
18	LOD	ST02	Door	Metal	A	Intact	Grey
19	LOD	ST02	Column	Concrete	C	Intact	Wallpaper
20	0.34	ST02	Column	Paneling	C	Intact	Wallpaper
21	0.34	ST02	Column	Paneling	C	Intact	Wallpaper
22	0.4	ST02	Wall	Paneling	A	Intact	Wallpaper
23	LOD	201A	Chair rail	Wood	A	Intact	Stain
24	LOD	215A	Wall	Concrete	A	Intact	Cream
25	LOD	215A	Wall	Cinder Block	A	Intact	Cream
26	LOD	215A	Wall	Cinder Block	C	Intact	Cream
27	0.23	215A	Handrail	Metal	C	Intact	Grey
28	0.23	215A	Handrail	Metal	C	Intact	Grey
29	0.05	215A	Handrail	Metal	A	Intact	Grey
30	LOD	215A	Door	Metal	D	Intact	Grey
31	LOD	215A	Door	Metal	D	Intact	Grey
32	0.22	215A	Door Casing	Metal	D	Intact	Beige
33	LOD	215A	Floor	Concrete	D	Poor	Beige
34	LOD	215A	Floor	Concrete	D	Poor	Beige
35	LOD	215A	Floor	Concrete	D	Poor	Beige
36	LOD	H101	Column	Concrete	B	Peeling	Cream
37	LOD	H101	Wall	Cinder Block	B	Peeling	Cream
38	LOD	H101	Column	Plaster	D	Intact	Cream
39	LOD	203	Pipe	Metal	B	Peeling	Beige
40	LOD	203	Column	Concrete	D	Peeling	Cream

LOD (Limit of Detection) = 0.1 mg/cm^2

Blue text indicates any concentrations of LBP which OSHA considers a potential exposure risk when impacted.

Red text indicates concentrations of LBP that have specific disposal requirements regulated by SCDHEC.

Appendix C – Summary of XRF Data

Date Scanned: 10/31/18

Reading #	Pb (mg/cm^2)	Room	Component	Substrate	Side	Condition	Color
41	LOD	203	Column	Concrete	D	Peeling	Cream
42	LOD	203	Wall	Cinder Block	B	Peeling	Cream
43	LOD	203	Door	Metal	D	Intact	Grey
44	0.52	203	Door Casing	Metal	D	Intact	Beige
45	LOD	203	Trash compactor	Metal	C	Intact	Black
46	LOD	203	Trash compactor	Metal	A	Intact	Blue
47	LOD	203	Overhead Door	Metal	D	Intact	Cream
48	LOD	203	Overhead Door	Metal	D	Intact	Cream
49	LOD	203	Overhead Door	Metal	D	Intact	Cream
50	0.93		Calibrate				
51	0.89		Calibrate				
52	0.99		Calibrate				

LOD (Limit of Detection) = 0.1 mg/cm^2

Blue text indicates any concentrations of LBP which OSHA considers a potential exposure risk when impacted.

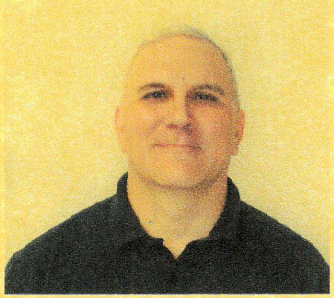
Red text indicates concentrations of LBP that have specific disposal requirements regulated by SCDHEC.

Appendix D

Personnel Certification

United States Environmental Protection Agency

This is to certify that



Jeffrey S Leary

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Inspector

In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires July 29, 2021

LBP-I-18721-1

Certification #

April 17, 2018

Issued On

Adrienne Priselac, Manager, Toxics Office

Land Division

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
1. Wood blocking and nailers.
2. Plywood backing panels.
3. Plywood sheathing.

1.3 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. SPIB: The Southern Pine Inspection Bureau.

1.4 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
3. Include copies of warranties from chemical treatment manufacturers for each treatment.

B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

C. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

1. Wood-preservative-treated wood.

2. Fire-retardant-treated plywood.
3. Power-driven fasteners.
4. Powder-actuated fasteners.
5. Expansion anchors.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.
4. Recycled Content of Steel Products: Provide products with an average recycled content of steel products as indicated in Division 01 Section "Sustainable Design Requirements" for LEED credit requirements.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA C2**,** except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood nailers, blocking, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.

2.3 FIRE-RETARDANT-TREATED MATERIALS (Plywood Backing Panels Only)

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Use treatment that does not promote corrosion of metal fasteners.
2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity.

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of the following species.

1. Southern pine; SPIB.

C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.5 PLYWOOD BACKING PANELS

A. Telephone and Electrical Equipment Backing Panels: Fire-retardant-treated plywood panels, DOC PS 1, Exposure 1, C-D Plugged**,** in thickness indicated or, if not indicated, not less than 3/4 inch nominal thickness.

2.6 PLYWOOD SHEATHING

A. Plywood Sheathing: DOC PS 1, Exposure 1, C-D Plugged sheathing.

1. Span Rating: Not less than 16/0.
2. Nominal Thickness: Not less than 3/4 inch nominal thickness.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

2.8 MISCELLANEOUS MATERIALS

A. Building Paper: Asphalt-saturated organic felt complying with ASTM D 226, Type I (No. 15 asphalt felt), unperforated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

D. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

F. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

G. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

END OF SECTION 061000

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Mineral-Wool blanket insulation.

B. Related Sections include the following:

1. Division 09 Sections "Gypsum Board" for installation in metal-framed assemblies of insulation specified by referencing this Section.
2. Division 22 Section "Plumbing Insulation."
3. Division 23 Section "HVAC Insulation."

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: Full-size units for each type of exposed insulation indicated.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for insulation products.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.

B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Surface-Burning Characteristics: ASTM E 84.

2. Fire-Resistance Ratings: ASTM E 119.
3. Combustion Characteristics: ASTM E 136.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 MINERAL-WOOL BLANKET INSULATION

A. Manufacturers:
1. Owens Corning.
2. Fibrex Insulations, Inc.
3. Thermifiber.
4. Roxul Inc.

B. Unfaced, Mineral-Wool Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics; thicknesses as indicated on Drawings.

2.3 AUXILIARY INSULATING MATERIALS

A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.

3.3 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.

C. Extend insulation in thickness indicated to envelop entire area to be insulated as indicated on Drawings. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

3.4 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes:

1. Silicone joint sealants.

2. Latex joint sealants.

3. Acoustical joint sealants.

B. Related Sections include the following:

1. Division 04 Section "Unit Masonry" for masonry control and expansion joint fillers and gaskets.

1.3 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

E. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

F. Qualification Data: For Installer.

G. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.

H. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

I. Field Test Report Log: For each elastomeric sealant application.

J. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.

K. Warranties: Special warranties specified in this Section.

L. Joint-Sealant Schedule: Include the following:

1. Joint-sealant application, joint location, and designation.

2. Joint-sealant manufacturer and product name.

3. Joint-sealant formulation.

4. Joint-sealant color.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.

4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

D. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the Notice to Proceed with the Work.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
3. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
4. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

E. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
2. Conduct field tests for each application indicated below:

    a. Each type of elastomeric sealant and joint substrate indicated.
    b. Each type of nonelastomeric sealant and joint substrate indicated.

3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

    a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193.

        1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

5. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

F. Mockups: Build mockups incorporating sealant joints, as follows, to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:

1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 2 years from date of Substantial Completion.

C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:

1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Architectural Sealants: 250 g/L.
2. Nonmembrane Roof Sealants: 300 g/L.
3. Roof Membrane Sealants: 450 g/L.
4. Sealant Primers for Nonporous Substrates: 250 g/L.
5. Sealant Primers for Porous Substrates: 775 g/L.
6. Modified Bituminous Sealant Primers: 500 g/L.

C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 SILICONE JOINT SEALANTS

A. Single-Component Neutral-Curing Silicone Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT (non-traffic), Nonstaining to porous substrates per ASTM C 1248.

1. Subject to compliance with requirements, provide one of the products listed below:

a. Dow Corning Corporation; 790.
b. GE Silicones; SilPruf LM SCS2700.
c. Tremco; Spectrem 1 (Basic).
d. Pecora Corporation; 890.
e. Sonneborn, Division of ChemRex Inc.; Omniseal.
f. Sika Corporation, Construction Products Division; SikaSil-C990.

B. Single-Component, Nonsag, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, For Use T (traffic).

1. Subject to compliance with requirements, provide one of the products listed below:

a. Pecora Corporation; 301 NS.
b. Tremco Incorporated; Spectrem 800.
c. Dow Corning Corporation; 790.

2.4 LATEX JOINT SEALANTS

A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

B. Subject to compliance with requirements, provide one of the products listed

1. Bostik, Inc.; Chem-Calk 600.
2. Pecora Corporation; AC-20+.
3. Schnee-Morehead, Inc.; SM 8200.
4. Tremco; Tremflex 834.
5. BASE Building Systems; Sonolac.

2.5 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following:

1. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

2. Products: Subject to compliance with requirements, provide one of the following:

a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

2.6 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), O (open-cell material), B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates

and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.
    b. Masonry.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.
    b. Glass.

B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.

    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

1. Joint Locations:

a. Isolation and contraction joints in cast-in-place concrete slabs.

2. Silicone Joint Sealant: Single-component, nonsag, traffic grade, neutral curing.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

a. Contraction joints in cast-in-place concrete.

b. Joints between plant-precast architectural concrete units.

c. Control and expansion joints in unit masonry.

d. Joints in exterior stucco systems.

e. Joints between different materials listed above.

f. Perimeter joints between materials listed above and frames of doors, windows and louvers.

g. Control and expansion joints in soffits and other overhead surfaces.

2. Silicone Joint-Sealant: Single component, nonsag, neutral curing, Class 100/50.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.

1. Joint Locations:

    a. Isolations joints in cast-in-place concrete slab.

    b. Control and expansion joints in tile flooring.

    c. Other joints as indicated.

2. Silicone Joint Sealant: Single-component, nonsag, traffic grade, neutral curing.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

    a. Control and expansion joints on exposed interior surfaces of exterior walls.

    b. Perimeter joints of exterior openings where indicated.

    c. Tile control and expansion joints.

    d. Vertical joints on exposed surfaces of interior unit masonry and concrete walls and partitions.

    e. Exposed joints on underside of plant-precast structural concrete planks.

    f. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.

    g. Other joints as indicated.

2. Joint-Sealant: Latex, acrylic based.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Sealant Location:

    a. Joints between plumbing fixtures and adjoining walls, floors and counters.

    b. Tile control and expansion joints where indicated.

    c. Other joints as indicated.

2. Joint-Sealant: Mildew-resistant, single component, nonsag, neutral curing, Silicone.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

F. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Location:

    a. Acoustical joints where indicated.

    b. Other joints as indicated.

2. Joint Sealant: Acoustical.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Standard hollow metal frames (Knock-down).

B. Related Sections:

1. Division 08 Section "Door Hardware" for door hardware for doors.
2. Division 09 Section "Interior Painting" for field painting hollow metal frames.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings.

B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, temperature-rise ratings, and finishes.

B. Shop Drawings: Include the following:

1. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
2. Locations of reinforcement and preparations for hardware.
3. Details of each different wall opening condition.
4. Details of anchorages, joints, field splices, and connections.
5. Details of accessories.

C. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal frame assembly.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

B. Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

B. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- (102-mm-) high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.8 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ceco Door Products; an Assa Abloy Group company.
4. Steel Craft; an Ingersoll-Rand company.
5. Republic Doors and Frames.
6. Palmetto Metal Products, Inc.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 (ZF120) coating.

D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.

E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

F. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type indicated.

2.3 STANDARD HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Interior Frames: Fabricated from cold-rolled steel sheet unless metallic-coated sheet is indicated.

1. Fabricate frames with mitered or coped corners.
2. Construction: Knocked-down unless otherwise indicated.
3. Frames for Level 3 Steel Doors: 0.053-inch- (1.3-mm-) (16 gage) thick steel sheet.

C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

2.4 FRAME ANCHORS

A. Jamb Anchors:
1. Postinstalled Expansion Anchor: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

2.5 STOPS AND MOLDINGS

A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch (0.8 mm) (20 gage) thick, fabricated from same material as door face sheet in which they are installed.

B. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated.

2.6 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble

units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

C. Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
2. Jamb Anchors: Provide number and spacing of anchors as follows:
   a. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
3. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.
   a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

D. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.

E. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce frames to receive nontemplated, mortised and surface-mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.7 STEEL FINISHES

A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prior to installation, adjust and securely brace hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:

1. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.

B. Drill and tap frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.

1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

    a. At fire-protection-rated openings, install frames according to NFPA 80.
    b. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
2. In-Place CMU Partitions: Secure frames in place with postinstalled expansion anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
3. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

C. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

SECTION 087100 – DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Definition: "Finish Hardware" includes items known commercially as finish / security hardware and systems which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.

B. Extent of finish / security hardware required is indicated on drawings and in Schedules.

C. Types of finish hardware required include, but are not limited to, the following:
   1. Butt Hinges
   2. Continuous Hinges
   3. Lock cylinders and keys
   4. Lock and latch sets
   5. Exit devices
   6. Pull units/Custom Pulls
   7. Closers
   8. ADA Operators and actuators
   9. Door trim units
   10. Weatherstripping for exterior doors
   11. Protection plates
   12. Thresholds, Gaskets, and Door Bottoms
   13. Key Cabinet
   14. Electrified Hardware
   15. Occupancy Indicator

D. References
   1. NFPA-80-2007 - Standard for Fire Doors and Windows
   2. NFPA-101- Life Safety Code as adopted.
   3. NFPA - 70 - National Electric Code
   4. ADA - The Americans with Disabilities Act - Title III - Public Accommodations
   5. ANSI-A 117.1-American National Standards Institute - Accessible and Usable Buildings and Facilities
   6. ANSI-A156.5-American National Standards Institute - Auxiliary Locks and Associated Products
   7. International Building Code as Adopted
   8. Positive Pressure Testing UL10C & UBC7.2
   9. UL - Underwriters Laboratories
   10. WHI - Warnock Hersey International, Division of Inchscape Testing Services
   11. State, Local and Federal Codes, National Electrical Building Codes, including the Authority Having Jurisdiction

1.04 QUALITY ASSURANCE

A. Manufacturer: Obtain each type of hardware (ie., lock sets / security equipment) from a single manufacturer, although several may be indicated as offering products complying with requirements.

B. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware and installation in the project's vicinity for a period of not less than 5 years. The supplier shall be, or shall employ, a certified Architectural Hardware Consultant (AHC) who is available, at reasonable times during the course of the work, for consultation about project's hardware requirements, to the Owner, Architect and the Contractor. The certified architectural hardware consultant (AHC) shall prepare all hardware and wiring diagrams. This Supplier is responsible for proper coordination of all finished hardware with related sections to insure compatibility of products. The Hardware Supplier shall attend all coordination meetings regarding hardware applications with related trades.

C. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80 and local building code requirements. Provide only hardware, which has been tested and listed by UL / WHI or FM for types and sizes of doors required and complies with requirements of door and door frame labels. Provide door seals to meet Positive Pressure Testing UL10C and UBC7 - 2 as required.

D. Where emergency exit devices are required on fire-rated doors (with supplementary marking on doors' UL or FM labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL / WHI or FM label on exit devices indicating "Fire Exit Hardware".

E. Thru bolt door closers and exit devices. Verify and coordinate proper blocking if provided from the door manufacturer for hardware attachment on doors.

F. Unless otherwise specified, provide lever handle locksets ADA compliant.

G. **Pre-Installation Meeting: The GC shall initiate and conduct a jobsite meeting with the hardware supplier and the Installer, and all related trades for mechanical and electrical hardware. This meeting shall convene at least one month prior to commencement of the related work, specifically, the electrical rough-in for coordination of electrified hardware applications. All approved shop drawings, wiring diagrams, and schedules shall be made available to all related trades as required for work to be performed. The Owner's representative shall attend all pre-install meetings. One month prior to the installation of the hardware, the hardware supplier shall, with the assistance of the manufacturer's representative, provide review/training to the Installers of the following products: closers, exit devices, locks, and electrified hardware.**

1.05 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data for each item of hardware in accordance with Division-1 section "Submittals". Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish.

B. Hardware Schedule: Submit copies of the schedule in accordance with Division 1 - "Submittals", General Requirements. Schedule shall be in vertical format, listing each door opening, including: handing, all hardware scheduled for the opening or otherwise required to allow for proper function of door openings as intended, and the finish of the hardware. At doors with door closers or door controls, include degree of door opening. If requested, all submittals (schedules, cut sheets, diagrams) shall be reviewed by the Owner's representative prior to ordering the material. Submit the schedules and all templates within two (2) weeks from date purchase order is received by the door openings supplier. Furnish wiring diagrams (elevation, riser, and point-to-point) for all electrified hardware.

1. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into a vertical format with "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
   a. Type, style, function, size and finish of each hardware item.
   b. Name and manufacturer of each item.
   c. Fastenings and other pertinent information.
   d. Maintain the same Set/Heading numbering from Part 3 of this section, or reference to the Spec Set number in the Heading.
   e. Reference door numbers from the door/frame schedule in the plan set.
   f. Explanation of all abbreviations, symbols, codes, etc., contained in schedule.
   g. Mounting locations for hardware.
   h. Door and frame sizes and materials.
   i. Keying information as available.
   j. One Heading/Set per page
   l. Operational Description for all specified electrical hardware shall be included with each Heading/Set.

C. Submittal Sequence: Submit hardware schedule and wiring diagrams according to the GC's established project schedule, particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames), and electrical rough-in, which is critical in the project construction schedule. Include with schedule the product data, catalog cuts, samples, templates, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.

D. Keying Schedule: Submit separate detailed schedule after meeting with the Owner to determine the Owner's instructions for keying. When keyed cylinders/cores will be furnished keyed by the Owner, a detailed schedule is not require.

E. Samples if Requested: Prior to submittal of the final hardware schedule and prior to final ordering of finish hardware, submit any requested samples of type of exposed hardware unit, finished as required, and tagged with full description for coordination with schedule.

F. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work, to confirm that adequate provisions are made for proper location, coordination and installation of hardware.

G. Manufacturer's Catalog Cuts: Submit manufacturer's cut/catalog sheets on all hardware items and any required special mounting instructions with the hardware schedule.

H. Wiring Diagrams: Provide complete wiring diagrams for each opening requiring electrified hardware. Provide a copy with each hardware schedule submitted after approval. Supply a copy with delivery of hardware to job site and another copy to the Owner at time of job completion. All electrical components

shall be listed by opening in the hardware submittals. Include an operational description with each diagram.

I. Operational Descriptions: Provide a complete operational description of the specified electrified hardware components for each opening, and include the description under the hardware set/heading in the hardware submittal. Operational descriptions shall detail how each electrified component functions within the opening, incorporating all conditions of ingress and egress. Review these descriptions with all related trades at the Pre-Install meetings.

J. Elevation Drawings: Provide elevation drawings of electronic hardware and systems identifying locations of the system components with respect to their placement in the door opening. Provide a copy with each hardware schedule submitted for approval. Supply another copy to the Owner upon project completion. Include an operational description with each drawing.

1.06 PRODUCT HANDLING

A. Tag each item or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.

B. Inventory hardware jointly with the General Contractor, representatives of hardware supplier / hardware installer until each is satisfied that count is correct.

C. Deliver individually packaged hardware items at the proper times to the proper locations (shop r project site) for installation.

D. The General Contractor shall provide secure lock-up for hardware and security equipment delivered to the project, but not yet installed. Control handling and installation of hardware items, which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

1.07 SEQUENCING AND SCHEDULING

A. Deliver all finish hardware to the job site in a timely manner so not to delay progress of other trades.

1.08 WARRANTY

A. All Door closer shall include a ten (10) year manufacturers' warranty against defects in materials and workmanship.

B. Exit Devices shall include a three (3) year warranty. ADA operators shall include a two (2) year warranty.

C. Hinges:
1. Life of Building.
2. Electrified Hardware: one (1) year
3. Other Hardware: three (3) years.

PART 2 - PRODUCTS

2.01 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this section. Products are identified by using hardware designation numbers of the following:

B. Manufacturers:

Hardware Item:	Specified Manufacturer	Designation

1.	Butts:	Ives	IV
2.	Continuous Hinges	Ives	IV
3.	Locksets:	Best	BE
4.	Cylinders/Cores	Best	BE
5.	Silencers:	Ives	IV
6.	Stops:	Ives	IV
7.	Overhead Stops	Glynn-Johnson	GLY
8.	Closers:	LCN	LC
9.	Thresholds:	Pemko	PE
10.	Gasket/Door Bottoms:	Pemko	PE
11.	Kickplates:	Rockwood	RO
12.	Pull/Push Plates:	Rockwood	RO
13.	Auto-Operator	LCN	LC
14.	Exit Devices:	Von Duprin	VO
15.	Flush Bolts:	Rockwood	RO
16.	Automatic Flush Bolts:	Rockwood	RO
17.	Magnetic Holders:	LCN	LCN
18.	Miscellaneous Hardware:	Ives, Glynn-Johnson	IV/GLY
19.	Key Control:	Not Required	
20.	Electric Strikes	HES/ASSA ABLOY	HE
21.	Power Supplies Power Transfers	Securitron	SN
22.	Door Position Switch; Request To Exit Switch	Securitron	SN
23.	Barn Door Slider	Daniels International	DI
24.	Door Pull	Rockwood	RO
25.	Occupancy Indicator	Jako	JAKO

C. Provide products as hereafter specified. Substitutions other than those manufacturers listed, must be approved, in writing, via addenda, prior to bid. Procedure for substitutions shall be as outlined in Division 1. No substitutions will considered after award of contract.

2.02 MATERIALS AND FABRICATION

A. General:
   1. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
   2. Manufacturer's Name Plate: Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location (omit removable nameplates), except in conjunction with required UL labels and as otherwise acceptable to Architect.
   3. Manufacturer's identification will be permitted on rim of lock cylinders only.
   4. Finishes:
      a. 626/652 for all finished metal hardware items except as 630 is otherwise indicated. Door closers to be powder coated to match 652/626. Exit devices shall be US26D with stainless steel touchbars.
   5. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware, which has been prepared for self-tapping sheet metal screws, except, as specifically indicated.
   6. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as

otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.

7. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Use thru-bolts for closer and exit devices. Coordinate wood door blocking at all wood doors and all fire-rated wood doors. Provide sleeves for each thru-bolt or use sex screw fasteners.
8. Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

2.03 HINGES AND BUTTS

A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

B. Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
1. Steel Hinges: Steel pins.
2. Non-ferrous Hinges: Stainless steel pins.
3. Exterior Doors: Non-removable pins.
4. Out-swing Corridor Doors: Non-removable pins.
5. Interior Doors: Non-rising pins.
6. Tips: Flat button and matching plug, finished to match leaves.
7. Number of hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.
8. Acceptable Manufacturers:
   a. Ives 5BB1/5BB1HW.
   b. Hager: BB1279/BB1191/BB1168/BB1199.
   c. Bommer: BB5000/BB5002/BB5004/BB5006.

D. Continuous Hinges: Provide concealed, non-handed, full height hinges with interlocking cover and symmetrically template hole pattern made from extruded aluminum. Finish shall be BHMA 628. minutes). Field modifications for cutting shall be permitted up to 6” from the bottom.
1. Acceptable Manufacturers:
   a. Ives: 112HD.
   b. Select: SL11HD.
   c. Roton: 780-112HD

2.04 LOCK CYLINDERS AND KEYING

A. General: The Hardware Supplier shall furnish the keyed permanent cores and keys for the project. The Owner or the Owner’s agent shall install permanent cores and return the construction cores to the Stanley Best Access System factory representative. . All permanent keyed cores shall be furnished as Stanley Best Access. Provide permanent keys and cores stamped with the applicable key mark for identification. These visual key control marks or codes shall not include the actual key cuts.

B. Equip locks and cylinders with 7-pin housings and with construction cores as specified. All cylinder housings shall accept the Best keyed permanent cores. The Hardware Supplier shall confirm all keying and

core requirements with the Owner's representative prior to ordering the cores

C. Furnish temporary construction keyed cores for the construction period of the project. Construction cores shall not be furnished as part of the Owner's existing key system. Furnish five(5) Construction Keys and one (1) control key for the General Contractor's use during project construction.

D. Equip locks with cylinders that comply with performance requirements for Grade 1 cylinders as listed in ANSI A156, and are UL-listed. All cylinder housings shall be capable of receiving the Owner's keyed permanent cores.

2.05 LOCKS, LATCHES AND BOLTS

A. Locksets shall be as specified: Mortise lockset shall be Series 1000, Grade 1 Operational and Security, UL Listed for 3-hour fire door. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with ANSI curved lip extended to protect frame, finished to match hardware set. Where specified, provide a replaceable breakaway spindle mechanism residing inside the lock chassis. The lock case shall be full wrapped heavy gauge steel with all metal zinc dichromate plated working parts. Lock case shall be universal function type and allow for field reversible handing without opening the lock case. Lever rotation shall be in both directions for ease of use, and allow for independent lever rotation.
   1. Acceptable Manufacturers:
      a. Schlage L9000 series.
      b. Best 45H series.
      c. Corbin-Russwin ML series.

B. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.

C. Lock Throw: Provide solid stainless steel 1 ½" deadbolt with 1" minimum throw. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

D. Provide 3/4" minimum throw on latch bolts.

E. Flush Bolt Heads: Minimum of 1/2" diameter rods of brass, bronze or stainless steel, with minimum 12" long rod for doors up to 7'-0" in height. Provide longer rods as necessary for doors exceeding 7'-0" in height.

F. Exit Device Dogging: Except on fire-rated doors, wherever closers are provided on doors equipped with exit devices, equip the units with keyed dogging device to hold the push bar down and the latch bolt in the open position.

2.06 PULLS/ PUSH PLATES

A. Exposed Fasteners: Provide manufacturer's standard exposed fasteners for installation; through-bolted for matched pairs, but not for single units. Furnish type and size as specified in Hardware Sets.

B. Acceptable Manufactures
   1. Rockwood
   2. Ives
   3. Trimco

2.07 CLOSERS AND DOOR CONTROL DEVICES

A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's

recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.

B. Closers: All door closers shall be of one manufacturer to provide for proper installation and servicing after installation. All closers shall be inspected after installation by a factory representative to ensure proper adjustment and operation. A report shall be filed with the architect after said visit has been made. Closer shall carry a manufacturer's TEN YEAR WARRANTY for hydraulic units and 2-year warranty for electrical and/or handicap power assist door closers against manufacturing defects and workmanship. PRV [pressure relief valves] are not acceptable.

C. Parallel Arm Closers: Shall incorporate one piece solid forged steel arms with bronze bushings. 1-9/16" x 1/2" steel stud shoulder bolts, shall be incorporated in regular arms, hold open arms, arms with stop built in, arms with hold open and stop built in. All other closers to have forged steel main arms for strength, and durability. Provide extra-duty arms (EDA) at doors scheduled with parallel arm applications.

D. Built-In Stops: Where closers with built-in positive stops are used, the stops shall be of one piece cast malleable iron material with built in springs. Where required, the hold-open assembly handle for these stops shall rotate on ball bearings.

E. All door closers shall pass UL10C positive pressure fire test.

F. Non-sized: All exterior closers shall be non-sized to provide a full range of Size 1 to 5 closing power, and shall be handed.

G. Hydraulic Fluid: All closers, with the exception of interior electronic closers, shall utilize temperature stable fluid capable of withstanding temperature ranges of 120 degrees F. to -30F. without requiring seasonal adjustment of closer speed to properly close the door. Fluid shall be nonflammable.

H. All closers shall have a powder coat finish on closer body, arm, cover and adapter plate. Furnish special rust inhibiting pretreat coating, as specified, for closer body, arm, cover and plates before the powder coat finish.

I. Provide all drop plates, shoe supports, templates, etc. to properly mount closers according to manufacturers' recommendations.

J. Acceptable Closer Manufacturers:
1. Norton 7500 series.
2. Corbin-Russwin DC6200/6210 series.
3. LCN 4111/4011.

2.08 EXIT DEVICES

A. General: All devices shall be of one manufacturer to provide for proper installation and servicing. Devices shall be furnished non-handed and capable of direct field conversion for all available trim functions. All devices shall carry a three year warranty against manufacturing defects and workmanship. All devices shall be push-through touch pad design as specified. No exposed touch bar fasteners, no exposed cavities when operated.

B. Furnish all touch-pad type devices with stainless steel touch bars. Plastic parts are not acceptable. Dogging mechanism shall be mechanical hook type with no plastic dogging cams.

C. Furnish all touch-pad type exit devices with deadlocking latch bolts. Latchbolts shall be moly-coated to reduce friction against the strike.

D. Furnish all touch-pad exit devices with heavy duty metal alloy construction, with horizontal adjustment to provide flush alignment with the device cover plate. End caps shall be flush with device housing with no raised edges.

E. Furnish roller strikes with all rim exit devices.

F. Furnish stabilizers similar to Von Duprin 154 with all removable mullions.

G. Outside Trim: Shall be heavy duty type and fastened by means of concealed welded lugs and thru-bolts from the inside. Trim shall be forged brass with a minimum average thickness on the escutcheon of .130. Plate with trim shall be brass with minimum average thickness of .090 and have forged pulls. Where Lever Handles are specified provide 996 type Break Away Trim. Where outside trim is specified, furnish trim that thru-bolts directly to the exit device center case.

H. Furnish cylinders with all lockable exit devices.

I. Furnish required filler plates and shim kits for flush mounting of exit devices on all doors requiring same.

J. Springs: Compression type only. Torsion springs are not acceptable.

K. Electrified Functions: Electric Latch Retraction – quiet operation both electrically and mechanically. Touch pad retraction. Device shall detect pulling out of touchpad repeadedly, or may be held retracted for extended periods of time. Electric operated trim device shall be furnished as Fail-Safe, unless otherwise specified. When the power is off, the trim is unlocked for free entry. The trim may then be relocked electrically by applying power.

L. All exit devices shall be Von Duprin 35 series as specified in the hardware sets.

2.09 DOOR TRIM UNITS

A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units); either machine screws or self-tapping screws.

B. Fabricate edge trim of stainless steel, not more than 1/2" nor less than 1/16" smaller in length than door dimension.

C. Fabricate protection plates (armor, kick or mop) not more than 2" less than door width on stop side and not more than 1" less than door width on pull side, x the height indicated.

D. Metal Plates: Stainless steel, .050" (U.S. 18 ga.), bevel 3 edges: top and both sides.

2.10 GASKETS, DOOR BOTTOMS

A. General: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf, except where stated the door manufacturer will provide the weatherstripping. Provide type, sizes and profiles shown or scheduled. Provide non-corrosive fasteners as recommended by manufacturer for application indicated. All gaskets for fire label doors shall comply with the door manufacturers label approvals. Fire-label wood doors shall be furnished as "Category A" type with the intumescent seal, integral to the door construction.

B. Sound seal: Provide types as indicated for sound isolation. As indicated in the Door Schedule each door shall receive an auto-matic door bottom and double row of bulb-type adhesive gasket.

C. Acceptable Manuafacturers:

1. Zero

2. National Guard

3. Pemko

2.11 THRESHOLDS

A. General: Except as otherwise indicated provide standard aluminum threshold unit of type, size and profile as shown or scheduled.

B. Provide thresholds that are 1" wider than depth of frame.

C. Provide thresholds with return closed ends where specified in Hardware Sets.

D. Acceptable Manufactures:

1. Zero

2. National Guard

3. Pemko

2.12 DOOR SILENCERS

A. All hollow metal frames shall have gray resilient type silencers, unless otherwise specified. Quantity: (3) on single doors and quantity (2) on pair of doors.

2.13 ELECTRIFIED HARDWARE

A. Where scheduled, supply electrified function as specified. Electric exit devices shall be furnished with electric latch retraction feature or electrified locking for outside trim. All electric devices shall be free egress at all times. The Access Control System, furnished by the Owner's Security Integrator, shall allow for credentials, cardreaders, monitoring, alarms, and client software. All wiring, junction boxes, and final connections for electrified hardware shall be furnished and installed by the electrical contractor.

B. Electrically operated locking devices shall be connected to the building fire and smoke/heat alarm systems as required for the specified function. Activation of alarm system shall disengage electric locking mechanism, allowing free, unrestricted egress through opening.

C. Coordinate installation of electrically operated hardware to insure proper size wire is used to power load (s).
1. Voltage drop shall not exceed 5% of load's stated voltage.
2. Wire length shall equal distance to load and back to supply (lock @ 50ft from power supply; wire length = 100 ft.) Two loads powered by on pair of wires draw double current and have half (50%) of resistance.

D. Furnish electrically operated hardware with power supply units, junction boxes, and other accessories needed for a complete, efficient installation. Coordinate electrified hardware requirements with all related trades at the Pre-Installation meeting, prior to project electrical rough-in.

E. Components Specified
1. Power Transfers: Furnish type recessed into the door and frame to allow electrical power to pass from door to frame without the use of door cords or butt type transfer hinges for electric latch

retraction function. Furnish manufacturer's back box of zinc dichromated treated steel, both power transfer and thru-wire butt hinge. Back boxes shall be provided to the hollow metal frame manufacture for installation on the frame prior to frame shipped to jobsite.

2. Electric Butt Hinge:
Electric Butt hinges shall comply with requirements for size, quantity, type, tcs., as set forth for non-electric butt hinges. Provide the number of electrified hinges as required for the opening, as close to the load to receive power. Electric hinges shall have a motar box fastened to the frame prior to installing the frame in the wall. Electric hinge shall permit passage of a constant flow of current from the jamb to door, regardless of door position. Provide the number of wires needed by the electro-mechanical hardware it supports, plus two additional wires for future consideration. Continuous circuit hinge to have wires concealed with 12" lead.

3. Power Supply: Power Supply shall be tested and certified to meet UL294. Furnish type required for the specified electrical function. Power supply shall have a constant output rating at both 12v and 24v settings. Furnish as universal 120VAC to 240VAC input, and include polarized option board connectors. The fire alarm interface board shall allow outputs to be configured as switched (power cut) or unswitched (power continues) when a signal is provided.

4. Door Position Switch: Furnish concealed type in frame and door.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect.

B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces, which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division-9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.

C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drill and countersink units, which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

F. Adjust and reinforce attachment substrate for proper installation and operation:
1. Gaskets: install jamb-applied gaskets before closers, overhead stops, rim strikes, etc.

G. Locate floor stops not more than 4 inches from the wall.

H. Verify actual locations of wiring connections before electrified door hardware is installed.

I. Examine doors and frames with the hardware installer for compliance with requirements for installation tolerances, labeled fire door assembly, wall and floor construction, and other conditions affecting door performance.

J. Existing door/frame conditions: The GC and all related trades shall review the existing conditions prior to ordering and installing any new hardware. Notify the architect of any exceptions. All existing doors scheduled to be re-worked and re-used shall be reviewed with the Finish Hardware Submittal and templates before the doors are prepped for the new hardware and re-hung in the door opening.

3.02 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units, which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

E. Continued Maintenance Service: Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by the representative[s] of the Finish Hardware manufacturer[s], shall return to the project and re-adjust every item of hardware to restore proper function of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items, which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of any current or predictable problems (of substantial nature) in the performance of the hardware and furnish copy to Owners Agent / Representative.

Hardware Sets

SET #01 –One Single Door 203AA

Opening Description: 3'-8" x 7'-0" x 1 3/4" HMD x HMF

4 Hinges	5BB1 4 1/2 x 4 1/2	626	IV
1 Lockset	45H-7D15J STD	630	BE
1 Closer	4040 XP EDA TBWMS	AL	LC
1 Protection Plate	K1050 10" x 42"	US32D	RO
1 Armor Plate	K1050A-6 42" x 36"	US32D	RO
3 Door Silencer	SR64		IV

END OF SECTION 087100

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes non-load-bearing steel framing members for the following applications:

1. Interior framing systems (e.g., supports for partition walls, framed soffits, furring, etc.).

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

PART 2 - PRODUCTS

2.1 NON-LOAD-BEARING STEEL FRAMING, GENERAL

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
2. Protective Coating: ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized, unless otherwise indicated.

2.2 STEEL FRAMING FOR FRAMED ASSEMBLIES

A. Steel Studs and Runners: ASTM C 645.

1. Minimum Base-Metal Thickness: 0.0179 inch (0.45 mm) except use 0.0312 inch as follows:

a. For head runner, sill runner, jamb, and crippled studs at door and other openings.
b. In locations to relieve ceramic tile backing panels.

2. Depth: As indicated on Drawings.

B. Slip-Type Head Joints: Where indicated, provide one of the following:

1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- (50.8-mm-) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches (305 mm) of the top of studs to provide lateral bracing.
2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch- (50.8-mm) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.

C. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

1. Minimum Base-Metal Thickness: 0.0179 inch (0.45 mm).

D. Cold-Rolled Channel Bridging: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.

1. Depth: 1-1/2 inches (38.1 mm).
2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38.1 by 38.1 mm), 0.068-inch- (1.73-mm-) thick, galvanized steel.

E. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Minimum Base Metal Thickness: 0.0179 inch (0.45 mm).
2. Depth: As indicated on Drawings.

F. Cold-Rolled Furring Channels: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.

1. Depth: 3/4 inch (19.1 mm) unless noted otherwise.
2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare-steel thickness of 0.0312 inch (0.79 mm).
3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.3 INSTALLING FRAMED ASSEMBLIES

A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

B. Install studs so flanges within framing system point in same direction.

1. Space studs as follows:

a. Single-Layer Application: 16 inches (406 mm) o.c., unless otherwise indicated.
b. Multilayer Application: 16 inches (406 mm) o.c., unless otherwise indicated.
c. Tile backing panels: 16 inches (406 mm) o.c., unless otherwise indicated.

C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

    a. Install two studs at each jamb, unless otherwise indicated.
    b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (12.7-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
    c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

D. Direct Furring:
    1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.

E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Interior gypsum board.

2. Tile backing panels.

3. Trim accessories.

B. Related Sections include the following:
1. Division 06 Section "Rough Carpentry" for wood framing and furring that supports gypsum board.
2. Division 07 Section “Fire-Resistive Joint Systems” for head-of-wall assemblies that incorporate gypsum board.
3. Division 09 Section "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board.
4. Division 09 painting Sections for primers applied to gypsum board surfaces.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

1.4 QUALITY ASSURANCE

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

C. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Install mockups for the following:

a. Each level of gypsum board finish indicated for use in exposed locations.

2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
3. Simulate finished lighting conditions for review of mockups.
4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PANELS, GENERAL

A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Gypsum.
b. CertainTeed Gypsum, Inc.
c. National Gypsum Company.
d. USG Corporation.

B. Moisture- and Mold-Resistant Type: With moisture- and mold-resistant core and surfaces.

1. Core: 5/8 inch (15.9 mm), Type X.
2. Long Edges: Tapered.
3. For walls and ceilings.

2.3 TILE BACKING PANELS **(For use at all wall locations to receive ceramic tile or porcelain wall panels.)**

A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. American Gypsum.
b. CertainTeed Corporation.
c. Georgia-Pacific Building Products.
d. National Gypsum Company.

2. Core: 5/8 inch (15.9 mm), Type X.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

B. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or ASTM C 1325, with manufacturer's standard edges.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. USG Corporation.
b. CertainTeed Corporation.
c. National Gypsum Company.

2.
3. Thickness: 5/8 inch (15.9 mm).
4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Paper-faced galvanized steel sheet.
2. Shapes:

a. Cornerbead; use outside corners, unless otherwise indicated.
b. Bullnose bead; paper-faced metal 1 ½, tape on bead, us at outside corners at all public corridor conditions and where indicated.
c. LC-Bead: J-shaped; exposed long flange receives joint compound; use for edge trim, unless noted otherwise.
d. Expansion (control) joint.
e. Curved-Edge Cornerbead: With notched or flexible flanges.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Fry Reglet Corp. (Basis-of-Design manufacturer; or provide similar trim by other mfrs.listed below):
1) "F" reveal molding DRMF-625-75 (at gwb ceilings to storefront mullions).
2) "V" reveal molding DRMV-25 (at gwb soffit control joints).
3) "W" reveal molding DRWT-50-50 (at gwb ceilings to cmu).
4) "Z" reveal molding DRMZ-625-75 (at gwb to walls and as otherwise indicated in Drawings).
5) "U" reveal molding DRM-625-625 (at gwb vertical and horizontal wall reveals as indicated in Drawings).
6) Drywall Molding End Closure DMEC-4875 (at drywall/metal stud conditions at storefront locations as indicated in Drawings).
b. Gordon, Inc.
c. Pittcon Industries.
d. MM Systems, Inc.

2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
3. Finish: Baked enamel finish, AA-C12C42R1X. Color as selected from manufacturer's standard.

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Wallboard: Paper.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

    a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.

D. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
2. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

1. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

D. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. Acoustical Sealant: As specified in Division 07 Section "Joint Sealants."

1. Provide sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Moisture- and Mold-Resistant Type: All walls and ceilings indicated to receive gypsum board.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.

3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

3.4 APPLYING TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at showers and walls to receive ceramic tile or porcelain wall panels as indicated on Drawings. Install with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations.

B. Cementitious Backer Units: ANSI A 108.11. Comply with manufacturer's written installation instructions and install at showers and walls to receive ceramic tile or porcelain wall panels as indicated on Drawings.

C. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners, unless otherwise indicated.
2. Bullnose Bead: Use at outside corners where indicated.
3. LC-Bead: Use for edge trim.

D. Exterior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners.
2. LC-Bead: Use at exposed panel edges.

E. Aluminum Trim: Install in locations indicated on Drawings.

3.6 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for tile.
3. Level 3: Fire-resistance rated assemblies and sound rates assemblies.
4. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.

    a. Primer and its application to surfaces are specified in other Division 09 Sections.

3.7 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 093000 - TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
1. Quarry tile. (QT)

1.3 DEFINITIONS

A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated.

B. Facial Dimension: Actual tile size (minor facial dimension as measured per ASTM C 499).

1.4 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:

1. Level Surfaces: Minimum 0.6.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.

C. Samples for Initial Selection: For each type grout indicated and accessories involving color selection.

D. Samples for Verification:

1. Full-size units of each type and composition of tile and for each color and finish required.

1.6 QUALITY ASSURANCE

A. Source Limitations for Tile: Obtain all tile of same color or finish from one source or producer.

1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store liquid latexes and emulsion adhesives in unopened containers and protected from freezing.

E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.

1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
2. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting and Grouting Materials" Article.

C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:

1. As selected by Architect from manufacturer's full range-see Finish Schedule and Finish Plans for Basis-of-Design designations and patterns.

D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer, unless otherwise indicated.

1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

2.2 TILE PRODUCTS

A. Quarry Tile (QT- REPLACEMENT FLOOR TILE, KITCHEN):

1. Composition: Quarry flash.
2. Module Size: 6" x 6".
3. Basis-of-Design Product: See Finish Schedule for selection.

2.3 WATERPROOFING/CRACK-SUPPRESSION MEMBRANES FOR THIN-SET TILE INSTALLATIONS

A. General: Manufacturer's standard product that complies with ANSI A118.12, selected from the following.

B. Fabric-Reinforced, Modified Bituminous-Sheet Product, 36" wide sheets, and trim tape, .040 nominal thickness:

1. Available Product: Schluter Systems L.P.; KERDI, or approved equivalent membrane system.

2. See Details and manufacturer's instructions for overlapping conditions for transitioning water to drain and up wall.

2.4 SETTING AND GROUTING MATERIALS

A. Manufacturers:
1. Custom Building Products.
2. LATICRETE International Inc.
3. MAPEI Corporation.

B. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:

C. Polymer-Modified Sanded Grout: ANSI A118.7.
1. Polymer Type: LATICRETE SPECTRALOCK 2000 IG, Epoxy or approved equivalent for Commercial Kitchens and Bars and All Unit Baths.
   a. Sanded grout mixture for joints 1/8 inch (3.2 mm) and wider.

b. Color to be selected to match existing conditions.

2.5 ELASTOMERIC SEALANTS

A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Division 07 Section "Joint Sealants."

1. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.

C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

1. Products:

a. Dow Corning Corporation; Dow Corning 786.
b. GE Silicones; Sanitary 1700.
c. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
d. Tremco, Inc.; Tremsil 600 White.

2.6 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.

1. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.

C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

D. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints that does not change color or appearance of grout.

1. Products:

a. Bonsal, W. R., Company; Grout Sealer.
b. Bostik; CeramaSeal Grout Sealer.
c. C-Cure; Penetrating Sealer 978.
d. Custom Building Products; Grout Sealer.
e. MAPEI Corporation; KER 003, Silicone Spray Sealer for Cementitious Tile Grout.

f. TEC Specialty Products Inc.; TA-256 Penetrating Silicone Grout Sealer.

2.7 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.

B. Provide concrete substrates for tile floors installed with thin-set mortar that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.

1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
2. Remove protrusions, bumps, and ridges by sanding or grinding.

C. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors

as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

D. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 INSTALLATION, GENERAL

A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" - 2010 that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.

B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation - 2013." Comply with TCA installation methods indicated in ceramic tile installation schedules.

C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

E. Jointing Pattern: Lay tile in running bond or grid pattern, as indicated in Finish Schedule and Finish Plans. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

F. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Locate joints in tile surfaces directly above joints in concrete substrates.
2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

G. Grout tile to comply with requirements of the following tile installation standards:

1. For ceramic tile grouts (sand-portland cement; dry-set, commercial portland cement; and latex-portland cement grouts), comply with ANSI A108.10.

3.4 WATERPROOFING/CRACK-SUPPRESSION MEMBRANE INSTALLATION

A. Install waterproofing/crack-suppression membrane to comply with ANSI A108.13 and waterproofing manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.

B. Do not install tile over waterproofing/crack-suppression membrane until waterproofing/crack-suppression membrane has cured and been tested to determine that it is watertight.

3.5 FLOOR TILE INSTALLATION

A. General: Install tile to comply with requirements in the Floor Tile Installation Schedule, including those referencing TCA installation methods and ANSI A108 Series of tile installation standards.

1. For installations indicated below, follow procedures in ANSI A108 Series tile installation standards for providing 95 percent mortar coverage.

    a. Tile floors in wet areas.
    b. Tile floors composed of tiles 8 by 8 inches or larger.
    c. Tile floors composed of rib-backed tiles.

B. Joint Widths: Install tile on floors with the following joint widths:
1. To match Existing.

C. Grout Sealer: Apply grout sealer to cementitious grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer on tile faces by wiping with soft cloth.

3.6 CLEANING AND PROTECTING

A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove latex-portland cement grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.

C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

3.7 INTERIOR TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Post-tensioned Concrete Subfloor:

1. Tile Installation: Thin-set mortar on reinforcing and cleavage membrane; **TCA F113-12**.

    a. Tile Type: Quarry tile.
    b. Crack Isolation/Waterproofing membrane.
    c. Thin-Set Mortar: Latex- portland cement mortar.
    d. Grout: Polymer-modified sanded grout.

END OF SECTION 093000

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Resilient base.
2. Resilient molding accessories.

1.3 SUBMITTALS

A. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches long, of each resilient product color, texture, and pattern required.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.6 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following time periods:

1. 48 hours before installation.
2. During installation.

3. 48 hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

C. Install resilient products after other finishing operations, including painting, have been completed.

1.7 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

PART 2 - PRODUCTS

2.1 RESILIENT BASE (RB-1)

A. Resilient Base:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Johnsonite, Recess Wallbase, See Finish Schedule for color selection.

B. Resilient Base Standard: ASTM F 1861.

1. Material Requirement: Type TP.
2. Manufacturing Method: Group I (solid, homogeneous.)
3. Style: Cove base with toe, recess profile.

C. Minimum Thickness: 0.125 inch.

D. Height: 4 inches.

E. Lengths: Coils in manufacturer's standard length.

F. Outside Corners: Job formed.

G. Inside Corners: Job formed.

H. Finish: Low luster.

2.2 RESILIENT MOLDING ACCESSORY

A. Resilient Molding Accessory:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Burke Mercer Flooring Products; Division of Burke Industries, Inc.
    b. Flexco, Inc.
    c. Johnsonite.
    d. Roppe Corporation, USA.

B. Joiner for Flooring Transition Description:
    1. FT-1: Carpet to Concrete: Johnsonite SLT-XX-A or Eq.

C. Material: Vinyl.

D. Profile and Dimensions: As indicated on Drawings and Flooring Transition Details.

E. Color: To match Resilient Base, see Finish Schedule.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

    a. Cove Base Adhesives: Not more than 50 g/L.
    b. Rubber Floor Adhesives: Not more than 60 g/L.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Resilient Stair Treads and Accessories: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.

a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until they are same temperature as the space where they are to be installed.

1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required—see Finish Plans for extent of new base, with existing base to remain in demolition areas. Terminate runs at inside corners or door frames, typical.

C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
2. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of carpet and resilient floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

B. Perform the following operations immediately after completing resilient product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products until Substantial Completion.

END OF SECTION 096513

SECTION 096816 – SHEET CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Tufted broadloom carpet (CPT) @ Stair/Landing.

B. Related Sections include the following:
1. Division 09 Sections "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet.

1.3 SUBMITTALS

A. Product Data: For the following, including installation recommendations for each type of substrate:

1. Carpet: For each type indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance.

B. Shop Drawings: Show the following:

1. Columns, doorways, enclosing walls and locations where cutouts are required in carpet.
2. Carpet type, color, and dye lot.
3. Locations where dye lot changes occur.
4. Seam locations, types, and methods.
5. Type of installation.
6. Pattern type, repeat size, location, direction, and starting point.
7. Pile direction.
8. Type, color, and location of edge, transition, and other accessory strips.
9. Transition details to other flooring materials.

C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet: 12-inch min. square Sample.

D. Product Schedule: For carpet, use same designations indicated on Drawings.

E. Qualification Data: For Installer.

F. Maintenance Data: For carpet to include in maintenance manuals. Include the following:

1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to carpet.

G. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.

B. Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to carpet installation including, but not limited to, the following:

1. Review delivery, storage, and handling procedures.
2. Review ambient conditions and ventilation procedures.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104, Section 5, "Storage and Handling."

1.6 PROJECT CONDITIONS

A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."

B. Environmental Limitations: Do not install carpet until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

C. Do not install carpet over concrete slabs until slabs have cured, are sufficiently dry to bond with adhesive, and have pH range recommended by carpet manufacturer.

D. Where items are indicated for installation on top of carpet, install carpet before installing these items.

1.7 WARRANTY

A. Special Warranty for Carpet: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet installation that fails in materials or workmanship within specified warranty period.

1. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism, or abuse.
2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, excess static discharge, and delamination.
3. Warranty Period: Lifetime-Limited Wear.

1.8 EXTRA MATERIALS

A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Carpet: Full-width rolls equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

PART 2 - PRODUCTS

2.1 TUFTED CARPET (CPT)

A. Basis of Design Products: Subject to compliance with requirements, provide products as indicated.

a. CPT-3: See Finish Schedule for Basis of Design manufacturer and color designation.

B. Pile Characteristic: Textured Loop Pile.

C. Face Weight: 32 oz./sq. yd. min.

D. Dye Method: Piece dyed.

E. Fiber Type: Antron Brilliance.

F. Secondary Backing: Ultraloc Pattern.

G. Width: 12 feet .

H. Flammability: ASTM E 648 Class 1

I. Smoke Density: ASTM E 662 Less than 450.

J. Applied Soil-Resistance Treatment: Shaw Soil Protection.

K. Antimicrobial Treatment: Manufacturer's standard material.

L. Performance Characteristics: As follows:

1. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm.
2. Dry Breaking Strength: Not less than 100 lbf per ASTM D 2646.
3. Tuft Bind: Not less than 3 lbf per ASTM D 1335.
4. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria; not less than 1-mm halo of inhibition for gram-negative bacteria; no fungal growth; per AATCC 174.

2.2 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet manufacturer.

C. Seam Adhesive: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for sealing and taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Examine carpet for type, color, pattern, and potential defects.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:

1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet manufacturer.
2. Subfloor finishes comply with requirements specified in Division 03 Section "Cast-in-Place Concrete" for slabs receiving carpet.
3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Comply with CRI 104, Section 7.3, "Site Conditions; Floor Preparation," and with carpet manufacturer's written installation instructions for preparing substrates.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8

inch (3 mm) wide or wider, and protrusions more than 1/32 inch (0.8 mm), unless more stringent requirements are required by manufacturer's written instructions.

C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet manufacturer.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet.

3.3 INSTALLATION

A. Comply with CRI 104 and carpet manufacturer's written installation instructions for the following:

1. Direct-Glue-Down Installation: Comply with CRI 104, Section 9, "Direct Glue-Down Installation."

B. Comply with carpet manufacturer's written recommendations and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.

C. Do not bridge building expansion joints with carpet.

D. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, and thresholds. Bind or seal cut edges as recommended by carpet manufacturer.

E. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

G. Install pattern parallel to walls and borders to comply with CRI 104, Section 15, "Patterned Carpet Installations" and with carpet manufacturer's written recommendations.

3.4 CLEANING AND PROTECTING

A. Perform the following operations immediately after installing carpet:

1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
2. Remove yarns that protrude from carpet surface.
3. Vacuum carpet using commercial machine with face-beater element.

B. Protect installed carpet to comply with CRI 104, Section 16, "Protection of Indoor Installations."

C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer and carpet adhesive manufacturer.

END OF SECTION 09682

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on, but not limited to the following interior substrates:

1. Steel.
2. Galvanized metal.
3. Wood.
4. Gypsum board.
5. Concrete.
6. Concrete masonry units (CMU).

1.2 ACTION SUBMITTALS

A. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

1. Submit Draw Down Samples, 8 x10 inches.
2. Label each Sample for location and application area per designation on Finish Schedule.

1.3 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.4 QUALITY ASSURANCE

A. Mockups: Apply mockups of **each** paint system/color indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).

b. Trim: Provide samples of at least 5 lineal ft.

2. Final approval of color selections will be based on mockups.

    a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following paint manufacturers:
1. Benjamin Moore & Co.
2. PPG Architectural Finishes, Inc.
3. Sherwin-Williams Company (The).

B. Manufacturers: Subject to compliance with requirements, provide products by the following write board coating manufacturers:
1. Basis of Design: Master Coating Technologies, Wink, wolfgordon.com/wink.
2. Or Approved Equivalent.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24)].

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints and Coatings: 150 g/L.
3. Primers, Sealers, and Undercoaters: 200 g/L.
4. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
5. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
6. Pretreatment Wash Primers: 420 g/L.

C. Colors: To match Architect's selection and existing conditions, and per mock-up adjustments, as required. See Finish Schedule.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Wood: 15 percent.
2. Gypsum Board: 12 percent.
3. Concrete: 12 percent.
4. Plaster: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth. Make minor repairs if necessary.

D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove existing wallcovering and paneling. Clean and sand surfaces for new painting.

C. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

D. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, wallpaper/paneling glue, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

G. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.

H. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

I. Wood Substrates:

1. Scrape and clean knots and apply coat of knot sealer before applying primer.
2. Sand surfaces that will be exposed to view and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.

4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
5. Paint with same system, as original coats.

J. Ductwork and Support Substrates: Verify that ducts and supports are cleaned and dryed before proceeding.

K. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

L. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional

coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE—See Finish Plan for Color Designations, verify sheen condition in field, confirm in Mock-ups.

A. Steel Substrates:

1. High-Performance Architectural Latex System:

a. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #79.
b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
a. Topcoat: Latex, interior, high performance architectural, (Gloss: Level 5 Semi-gloss, MPI #54.)

B. Galvanized-Metal Substrates:

1. High-Performance Architectural Latex System:

a. Prime Coat: Primer, galvanized, water based, MPI #134.
b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
a. Topcoat: Latex, interior, high performance architectural, (Gloss: Level 5 Semi-gloss, MPI #54.)

C. Gypsum Board Substrates:

1. High-Performance Architectural Latex System:

a. Prime Coat: Primer sealer, latex, interior**,** MPI #50.
b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
c. Topcoat: Latex, interior, high performance architectural, (Gloss: Level 2– Low-Sheen Eg-Shel), MPI #138.

D. Concrete Substrates:

1. Institutional Low-Odor/VOC Latex System, MPI INT 3.1M:

a. Prime Coat: Primer sealer, interior, institutional low odor/VOC, MPI #149.
b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
c. Gloss Level 5, MPI #147.

E. CMU Substrates:

1. Institutional Low-Odor/VOC Latex System:

a. Block Filler: Block filler, latex, interior/exterior, MPI #4.
b. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (Gloss Level 5), MPI #147.

END OF SECTION 099123

SECTION 099600 - HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes surface preparation and application of high-performance coating systems on the following substrates:

1. Interior Substrates:
   a. Concrete Floors, 'SPC' Urethane Slurry System.

B. Related Requirements:

1. Division 9 painting Sections for special-use coatings and general field painting.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of topcoat product indicated.

C. Samples for Verification: For each type of coating system and in each color and gloss of topcoat indicated.

1. Submit Samples on rigid backing, 3 x 3 inches.
2. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. VOC content.

1.4 QUALITY ASSURANCE

A. Mockups: Apply mockups of each coating system indicated to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each coating system specified in Part 3.

    a. Flooring surfaces: Provide samples of a least 50 square feet.

2. Final approval of texture and color selections will be based on mockups.

    a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 HIGH-PERFORMANCE COATINGS, GENERAL

A. Material Compatibility:

1. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a coating system, provide products recommended in writing by manufacturers of topcoat for use in coating system and on substrate indicated.
3. Provide products of same manufacturer for each coat in a coating system.

B. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior coatings applied at project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

1. Nonflat Paints and Coatings: 150 g/L.
2. Primers, Sealers, and Undercoaters: 200 g/L.
3. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: 250 g/L.
4. Zinc-Rich Industrial Maintenance Primers: 340 g/L.

C. Colors: Light grey tone-as selected by Architect from manufacturer's full range.

2.2 INTERIOR CONCRETE FLOOR COATINGS (SPC-Special Coating)

A. Four-component Self-Leveling Urethane Slurry System Coating.

1. Basis of Design: Sherwin Williams/General Polymers FasTop 12SL w/ 46 Grit Aluminum Oxide (1 coat 3746) or pre-approved equivalent.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

C. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Beginning coating application constitutes Contractor’s acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

D. Concrete surfaces shall be abrasive blasted to remove all surface contaminants and laitance. The prepared concrete shall have a surface profile equal to CSP 3-4. Consult manufacturer is oil or grease is present. After initial preparation, inspect the concrete for voids and other imperfections. Voids should be filled with manufacturer's system filler; protrusions should be ground smooth. Allow all repair material to cure a minimum of 8 hours before covering with new coating material.

E. At perimeter threshold that transitions to existing concrete, sawcut to a minimum depth of 2x the material thickness, 2-6 inches from the seam of transition. Slope surface from thickness of new coating to existing surface level. See Transition Detail.

3.3 APPLICATION

A. Apply high-performance coatings according to manufacturer's written instructions.

1. Use applicators and techniques suited for coating and substrate indicated.
2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

B. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.

C. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.5 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Concrete Floor Substrates: (Designation: ' **SPC** ' See Finish Schedule and Finish Drawings for extents.)

1. Four-component Self-Leveling Urethane Slurry System:

    a. Prime Coat.
    b. Intermediate Coat: Slurry
    c. Intermediate Coat: Aluminum Oxide with anti-slip aggregate.
    d. Seal Coat.

END OF SECTION 099600

SECTION 102650 - IMPACT-RESISTANT WALL PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Wall guard 'rub rails.'
2. Corner guards.

1.3 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, impact strength, fire-test-response characteristics, dimensions of individual components and profiles, and finishes for each impact-resistant wall protection unit.

B. Shop Drawings: For each impact-resistant wall protection unit showing locations and extent. Include sections, details, and attachments to other work.

1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Initial Selection: For each type of impact-resistant wall protection unit indicated.

1. Include similar Samples of each item specified involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Wall and Corner Guards: 12 inches (300 mm) long. Include examples of joinery, corners, end caps, top caps, and field splices.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Material Certificates: For each impact-resistant plastic material, from manufacturer.

C. Material Test Reports: For each impact-resistant plastic material.

D. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each impact-resistant wall protection unit to include in maintenance manuals.

1. Include precautions against using cleaning materials and methods that may be detrimental to plastic finishes and performance.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Corner-Guards: Full-size plastic covers of maximum length equal to 2 percent of each type, color, and texture of units installed, but no fewer than two, 4-foot- long units.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Source Limitations: Obtain impact-resistant wall protection units from single source from single manufacturer.

C. Product Options: Drawings indicate size, profiles, and dimensional requirements of impact-resistant wall protection units and are based on the specific system indicated. Refer to Section 01400 "Quality Requirements."

D. Surface-Burning Characteristics: Provide impact-resistant, plastic wall protection units with surface-burning characteristics as determined by testing identical products per ASTM E 84, NFPA 255, or UL 723 by UL or another qualified testing agency.

E. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

F. Preinstallation Conference: Conduct conference at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store impact-resistant wall protection units in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1. Maintain room temperature within storage area at not less than 70 deg F (21 deg C) during the period plastic materials are stored.
2. Keep plastic sheet material out of direct sunlight.
3. Store plastic wall protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F (21 deg C).

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install impact-resistant wall protection units until HVAC system is operating and maintaining temperature at 70 deg F (21 deg C) for not less than 72 hours before beginning installation and for the remainder of the construction period.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of impact-resistant wall protection units that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures.
b. Deterioration of plastic and other materials beyond normal use.

2. Warranty Period: Limited Lifetime Warranty from date of Substantial Completion against material and manufacturing defects.

PART 2 - PRODUCTS

2.1 MATERIALS

A. PVC Plastic: ASTM D 1784, Class 1, textured, chemical- and stain-resistant, high-impact-resistant PVC or acrylic-modified vinyl plastic with integral color throughout; extruded and sheet material, thickness as indicated.

1. Impact Resistance: Minimum 25.4 ft-lbf/in. (1356 J/m) of notch when tested according to ASTM D 256, Test Method A.
2. Self-extinguishing when tested according to ASTM D 635.
3. Flame-Spread Index: 25 or less.
4. Smoke-Developed Index: 450 or less.

B. Polycarbonate Plastic Sheet: ASTM D 6098, S-PC01, Class 1 or 2, abrasion resistant; with a minimum impact-resistance rating of 15 ft-lbf/in. (800 J/m) of notch when tested according to ASTM D 256, Test Method A.

C. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

D. Adhesive: As recommended by impact-resistant plastic wall protection manufacturer and with a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.2 WALL GUARDS

A. Impact-Resistant **Wall Guards 'WG'.** Fabricated from plastic sheet wall-covering material.

Subject to compliance with requirements, or comparable product by one of the following:

a. IPC Door and Wall Protection Systems; Division of InPro Corporation, Rub Rail, Model R4-S-X24.
b. CS Acrovyn.
c. Korogard Wall Protection Systems; a division of RJF International Corporation.
d. Prior Approved Equal.

2. Size: 48 by 96 inches (1219 by 2438 mm) for sheet (or) 48 by 120 inches (1219 by 3048 mm) for roll.
3. Sheet Thickness: 0.040 inch (1.0 mm).
4. Color and Texture: As selected by Architect from manufacturer's full range.
5. Height: 4'-0" widths, as indicated. Mount above vinyl base. See elevations
6. Trim and Joint Moldings: Extruded rigid plastic that matches sheet wall covering color.
7. Mounting: Adhesive, to drywall with PL-Premium adhesive.

2.3 CORNER GUARDS

A. Surface-Mounted, Metal **Corner Guards**, '**CG**': Fabricated as one piece from formed or extruded metal with formed edges; with 90-degree turn to match wall condition.
1. Material: Stainless-steel sheet, Type 304.

a. Thickness: Minimum 0.0500 inch (1.3 mm).
b. Finish: Directional satin, No. 4.
2. Wing Size: Nominal 2-1/2 by 2-1/2 inches (65 by 65 mm).
3. Height: 4'-0"
4. Corner Radius: 1/8 inch (3 mm).
5. Mounting: Adhesive.

2.4 FABRICATION

A. Fabricate impact-resistant wall protection units to comply with requirements indicated for design, dimensions, and member sizes, including thicknesses of components.

B. Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.

C. Fabricate components with tight seams and joints with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

EXECUTION

2.5 EXAMINATION

A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances**,** fire rating, and other conditions affecting performance of work.

B. Examine walls to which impact-resistant wall protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

2.6 PREPARATION

A. Complete finishing operations, including painting, before installing impact-resistant wall protection system components.

B. Before installation, clean substrate to remove dust, debris, and loose particles.

2.7 INSTALLATION

A. General: Install impact-resistant wall protection units level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

1. Install impact-resistant wall protection units in locations and at mounting heights indicated on Drawings. See Elevation.

2. Provide splices, mounting hardware, anchors, and other accessories required for a complete installation.

B. Impact-Resistant Wall Covering: Install edge moldings, corners, and divider bars as required for a complete installation.

2.8 CLEANING

A. Immediately after completion of installation, clean plastic covers and accessories using a standard, ammonia-based, household cleaning agent.

B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION 102650

SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

B. Related Sections:

1. Division 10 Section "Fire Extinguisher Cabinets."

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.

B. Product Schedule: For fire extinguishers. Coordinate final fire extinguisher schedule with fire protection cabinet schedule to ensure proper fit and function.

C. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

D. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1. Provide fire extinguishers approved, listed, and labeled by FMG.

1.5 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire protection cabinets to ensure fit and function.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Faulty operation of valves or release levers.

2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire protection cabinet and mounting bracket indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. J. L. Industries, Inc.; a division of Activar Construction Products Group.
   b. Kidde Residential and Commercial Division; Subsidiary of Kidde plc.
   c. Larsen's Manufacturing Company.
   d. Potter Roemer LLC.

2. Valves: Manufacturer's standard.
3. Handles and Levers: Manufacturer's standard.
4. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging.

B. For Kitchens: Wet-Chemical Type: UL-rated 2-A:1-B:C:K, 2.5-gal. (9.5-L) nominal capacity, with potassium acetate-based chemical in stainless-steel container; with pressure-indicating gage.

C. For Mechanical and Electrical Rooms: Regular Dry-Chemical Type in Steel Container: UL-rated 40-B:C, 6-lb (2.7-kg) nominal capacity, with sodium bicarbonate-based dry chemical in enameled-steel container.

D. For All Locations Unless Noted Otherwise: Multipurpose Dry-Chemical Type in Steel Container: UL-rated 2-A:10-B:C, 5-lb (2.3-kg) nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

2.2 MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. J. L. Industries, Inc.; a division of Activar Construction Products Group.
   b. Kidde Residential and Commercial Division; Subsidiary of Kidde plc.
   c. Larsen's Manufacturing Company.
   d. Potter Roemer LLC.

B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.

1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

   a. Orientation: Vertical.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.

1. Mounting Brackets: 54 inches (1372 mm) above finished floor to top of fire extinguisher.

B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION 104416