



## **PROJECT MANUAL**

**1600 HAMPTON ANNEX - DEFERRED MAINTENANCE  
UNIVERSITY OF SOUTH CAROLINA**

**STATE PROJECT NO: H27-6107  
USC PROJECT NO. CP00394873  
A/E COMMISSION NO. 12113**

**February 10, 2014**



**JUMPER CARTER SEASE/ARCHITECTS, P.A.  
412 MEETING STREET \* WEST COLUMBIA, S.C. 29169**



**DIVISION 0 BIDDING AND CONTRACT DOCUMENTS**

SE-310	Request for Advertisement/Invitation for Construction Bids (07/20/11)
AIA-A701-1997	Instructions to Bidders
00201-OSE	Standard Supplemental Instructions to Bidders (10/22/11)
AIA-A310-2010	Bid Bond (2010 Edition)
SE-330	Standard Bid Form (09/21/11)
AIA-101-2007	Standard Form of Agreement Between Owner & Contractor
00501-OSE	Standard Modifications to AIA A101 (12/02/13)
AIA-A201-2007	General Conditions of the Contract for Construction
00811-OSE	Standard Supplementary Conditions (12/11/13)
-----	USC Supplemental General Conditions for Construction Projects
SE-355	Performance Bond (10/29/12)
SE-357	Labor & Material Payment Bond (10/29/12)
SE-480	Construction Change Order (2011)
-----	Contractor's One Year Guarantee
-----	Campus Vehicle Expectations

**DIVISION 1 GENERAL REQUIREMENTS**

01 10 00	Summary
01 10 10-A	Special Conditions
01 20 00	Schedule of Completion
01 21 00	Allowances
01 23 00	Alternates
01 24 00	Contract Modification Procedures
01 29 00	Payment Procedures
01 31 00	Project Management and Coordination
01 32 00	Construction Progress Documentation
01 42 00	References
01 50 00	Temporary Facilities and Controls
01 52 40	Construction Waste Management
01 73 20	Selective Demolition
01 77 00	Closeout Procedures
01 80 00	List of Drawings

**DIVISION 22 PLUMBING**

22 05 00	Mechanical, Plumbing
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**DIVISION 23 HEATING, VENTILATING, AND AIR CONDITIONING**

23 00 00	Mechanical, General
23 05 00	Testing and Balancing
23 07 00	Mechanical, Insulation
23 21 13	Mechanical, Piping
23 31 23	Ductwork
23 34 23	Fans and Air Distribution
23 81 26	Ductless Split System Heat Pumps
23 81 43	Packaged Heat Pumps
23 82 19	Split System Heat Pumps

**DIVISION 25 INTEGRATED AUTOMATION**

25 55 00	Automatic Temperature Controls
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**DIVISION 26 ELECTRICAL**

26 05 00	Electrical Basic Materials and Methods
26 05 29	Hangers and Supports for Electrical Systems

**DIVISION 28**      **ELECTRONIC SAFETY AND SECURITY**  
28 31 00      Fire Alarm System

**APPENDIX**      **HAZARDOUS MATERIAL ASSESSMENTS**  
Limited Lead-Based Paint Investigation Report  
Limited Asbestos Containing Materials Investigation Report

END OF SECTION 00 00 10



# SE-310 REQUEST FOR ADVERTISEMENT

2011 Edition  
Rev. 7/20/2011

**PROJECT NAME:** 1600 Hampton Annex Deferred maintenance

**PROJECT NUMBER:** H27-6107

**PROJECT LOCATION:** University of South Carolina, Columbia, SC

Contractor may be subject to performance appraisal at close of project

**BID SECURITY REQUIRED?** Yes ☒ No ☐

**PERFORMANCE & PAYMENT BONDS REQUIRED?** Yes ☒ No ☐

**CONSTRUCTION COST RANGE:** \$500,000 - \$625,000

**DESCRIPTION OF PROJECT:** Demolition and installation of new systems including architectural, plumbing, mechanical, electrical, and fire alarm. Asbestos abatement by Owner. Small and minority business participation is encouraged.

**A/E NAME:** Jumper Carter Sease Architects, PA

**A/E CONTACT:** Darryn Bouknight, AIA LEED AP

**A/E ADDRESS:** Street/PO Box: 412 Meeting Street

City: West Columbia

State: SC ZIP: 29169-

**EMAIL:** dbouknight@jcsarchitects.com

**TELEPHONE:** (803) 791-1020

**FAX:** (803) 791-1022

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

**BIDDING DOCUMENTS/PLANS MAY BE OBTAINED FROM:** http://purchasing.sc.edu (See Facilities Construction Solicitations and Awards)

**PLAN DEPOSIT AMOUNT:**        **IS DEPOSIT REFUNDABLE:** Yes ☐ No ☐

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.

**BIDDING DOCUMENTS/PLANS ARE ALSO ON FILE FOR VIEWING PURPOSES ONLY AT** *(list name and location for each plan room or other entity):*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**PRE-BID CONFERENCE?** Yes ☒ No ☐ **MANDATORY ATTENDANCE?** Yes ☐ No ☒

**DATE:** 2/25/2014 **TIME:** 10:00 AM **PLACE:** 743 Greene Street, Conf Rm 53, Columbia, SC

**AGENCY:** University of South Carolina Facilities Planning and Construction

**NAME OF AGENCY PROCUREMENT OFFICER:** Juaquana Brookins

**ADDRESS:** Street/PO Box: 743 Greene Street

City: Columbia

State: SC ZIP: 29169-

**EMAIL:** jbrookin@fmc.sc.edu

**TELEPHONE:** 803-776-3596

**FAX:** 803-777-7334

**BID CLOSING DATE:** 3/11/2014 **TIME:** 2:00 PM **LOCATION:** 743 Greene Street, Conf Rm 53, Columbia, SC

**BID DELIVERY ADDRESSES:**

**HAND-DELIVERY:**

Attn: Juaquana Brookins

Facilities Center

743 Greene Street

Columbia, SC 29208

**MAIL SERVICE:**

Attn: Juaquana Brookins

Facilities Center

743 Greene Street

Columbia, SC 29208

**IS PROJECT WITHIN AGENCY CONSTRUCTION CERTIFICATION? (Agency MUST check one)** Yes ☒ No ☐

**APPROVED BY** *(Office of State Engineer):* \_\_\_\_\_

**DATE:** \_\_\_\_\_

**AIA- A701 (1997)**  
Instructions To Bidders

Original AIA Document on file at the office of

Jumper Carter Sease Architects  
412 Meeting Street  
West Columbia, SC 29169  
(803) 791-1020

**OSE FORM 00201****STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS****OWNER:** University of South Carolina**PROJECT NUMBER:** H27-6107**PROJECT NAME:** 1600 Hampton Annex - Deferred Maintenance**PROJECT LOCATION:** University of South Carolina**PROCUREMENT OFFICER:** Juaquana Brookins**1. STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

**1.1.** These Standard Supplemental Instructions To Bidders amend or supplement Instructions To Bidders (AIA Document A701-1997) and other provisions of Bidding and Contract Documents as indicated below.

**1.2.** Compliance with these Standard Supplemental Instructions is required by the Office of State Engineer (OSE) for all State projects when competitive sealed bidding is used as the method of procurement.

**1.3.** All provisions of A701-1997, which are not so amended or supplemented, remain in full force and effect.

**1.4.** Bidders are cautioned to carefully examine the Bidding and Contract Documents for additional instructions or requirements.

**2. MODIFICATIONS TO A701-1997**

**2.1.** *Delete Section 1.1 and insert the following:*

**1.1** Bidding Documents, collectively referred to as the **Invitation for Bids**, include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement, Instructions to Bidders (A-701), Supplementary Instructions to Bidders, the bid form (SE-330), the Intent to Award Notice (SE-370), and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda issued prior to execution of the Contract, and other documents set forth in the Bidding Documents. Any reference in this document to the Agreement between the Owner and Contractor, AIA Document A101, or some abbreviated reference thereof, shall mean the AIA A101, 2007 Edition as modified by OSE Form 00501 – Standard Modification to Agreement Between Owner and Contractor. Any reference in this document to the General Conditions of the Contract for Construction, AIA Document A201, or some abbreviated reference thereof, shall mean the AIA A201, 2007 Edition as modified by OSE Form 00811 – Standard Supplementary Conditions.

**2.2.** *In Section 1.8, delete the words “and who meets the requirements set forth in the Bidding Documents”.*

**2.3.** *In Section 2.1, delete the word “making” and substitute the word “submitting.”*

**2.4.** *In Section 2.1.1:*

*After the words “Bidding Documents,” delete the word “or” and substitute the word “and.”*

*Insert the following at the end of this section:*

Bidders are expected to examine the Bidding Documents and Contract Documents thoroughly and should request an explanation of any ambiguities, discrepancies, errors, omissions, or conflicting statements. Failure to do so will be at the Bidder's risk. Bidder assumes responsibility for any patent ambiguity that Bidder does not bring to the Owner's attention prior to bid opening.

**2.5.** *In Section 2.1.3, insert the following after the term “Contract Documents” and before the period:*

and accepts full responsibility for any pre-bid existing conditions that would affect the Bid that could have been ascertained by a site visit. As provided in Regulation 19-445.2042(B), A bidder's failure to attend an advertised pre-bid conference will not excuse its responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the State.

**OSE FORM 00201****STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

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**2.6.** *Insert the following Sections 2.2 through 2.6:*

**2.2 CERTIFICATION OF INDEPENDENT PRICE DETERMINATION**

GIVING FALSE, MISLEADING, OR INCOMPLETE INFORMATION ON THIS CERTIFICATION MAY RENDER YOU SUBJECT TO PROSECUTION UNDER SECTION 16-9-10 OF THE SOUTH CAROLINA CODE OF LAWS AND OTHER APPLICABLE LAWS.

(a) By submitting an bid, the bidder certifies that—

(1) The prices in this bid have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other bidder or competitor relating to—

- (i) Those prices;
- (ii) The intention to submit an bid; or
- (iii) The methods or factors used to calculate the prices offered.

(2) The prices in this bid have not been and will not be knowingly disclosed by the bidder, directly or indirectly, to any other bidder or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) No attempt has been made or will be made by the bidder to induce any other concern to submit or not to submit an bid for the purpose of restricting competition.

(b) Each signature on the bid is considered to be a certification by the signatory that the signatory—

(1) Is the person in the bidder's organization responsible for determining the prices being offered in this bid, and that the signatory has not participated and will not participate in any action contrary to paragraphs (a)(1) through (a)(3) of this certification; or

(2)(i) Has been authorized, in writing, to act as agent for the bidder's principals in certifying that those principals have not participated, and will not participate in any action contrary to paragraphs (a)(1) through (a)(3) of this certification [As used in this subdivision (b)(2)(i), the term "principals" means the person(s) in the bidder's organization responsible for determining the prices offered in this bid];

(ii) As an authorized agent, does certify that the principals referenced in subdivision (b)(2)(i) of this certification have not participated, and will not participate, in any action contrary to paragraphs (a)(1) through (a)(3) of this certification; and

(iii) As an agent, has not personally participated, and will not participate, in any action contrary to paragraphs (a)(1) through (a)(3) of this certification.

(c) If the bidder deletes or modifies paragraph (a)(2) of this certification, the bidder must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

**2.3 DRUG FREE WORKPLACE**

By submitting a bid, the Bidder certifies that Bidder will maintain a drug free workplace in accordance with the requirements of Title 44, Chapter 107 of South Carolina Code of Laws, as amended.

**2.4 CERTIFICATION REGARDING DEBARMENT AND OTHER RESPONSIBILITY MATTERS**

(a) (1) By submitting an Bid, Bidder certifies, to the best of its knowledge and belief, that-

(i) Bidder and/or any of its Principals-

(A) Are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any state or federal agency;

(B) Have not, within a three-year period preceding this bid, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in

**OSE FORM 00201****STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of bids; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(C) Are not presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph (a)(1)(i)(B) of this provision.

(ii) Bidder has not, within a three-year period preceding this bid, had one or more contracts terminated for default by any public (Federal, state, or local) entity.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

(b) Bidder shall provide immediate written notice to the Procurement Officer if, at any time prior to contract award, Bidder learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) If Bidder is unable to certify the representations stated in paragraphs (a)(1), Bid must submit a written explanation regarding its inability to make the certification. The certification will be considered in connection with a review of the Bidder's responsibility. Failure of the Bidder to furnish additional information as requested by the Procurement Officer may render the Bidder nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Bidder is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Bidder knowingly or in bad faith rendered an erroneous certification, in addition to other remedies available to the State, the Procurement Officer may terminate the contract resulting from this solicitation for default.

**2.5 ETHICS CERTIFICATE**

By submitting a bid, the bidder certifies that the bidder has and will comply with, and has not, and will not, induce a person to violate Title 8, Chapter 13 of the South Carolina Code of Laws, as amended (ethics act). The following statutes require special attention: Section 8-13-700, regarding use of official position for financial gain; Section 8-13-705, regarding gifts to influence action of public official; Section 8-13-720, regarding offering money for advice or assistance of public official; Sections 8-13-755 and 8-13-760, regarding restrictions on employment by former public official; Section 8-13-775, prohibiting public official with economic interests from acting on contracts; Section 8-13-790, regarding recovery of kickbacks; Section 8-13-1150, regarding statements to be filed by consultants; and Section 8-13-1342, regarding restrictions on contributions by contractor to candidate who participated in awarding of contract. The state may rescind any contract and recover all amounts expended as a result of any action taken in violation of this provision. If contractor participates, directly or indirectly, in the evaluation or award of public contracts, including without limitation, change orders or task orders regarding a public contract, contractor shall, if required by law to file such a statement, provide the statement required by Section 8-13-1150 to the procurement officer at the same time the law requires the statement to be filed.

**2.6 RESTRICTIONS APPLICABLE TO BIDDERS & GIFTS**

Violation of these restrictions may result in disqualification of your bid, suspension or debarment, and may constitute a violation of the state Ethics Act. (a) After issuance of the solicitation, ***bidder agrees not to discuss this procurement activity in any way with the Owner or its employees, agents or officials.*** All communications must be solely with the Procurement Officer. This restriction may be lifted by express written permission from the Procurement Officer. This restriction expires once a contract has been formed. (b) Unless otherwise approved in writing by the Procurement

**OSE FORM 00201****STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

Officer, *bidder agrees not to give anything to the Owner, any affiliated organizations, or the employees, agents or officials of either, prior to award.* (c) Bidder acknowledges that the policy of the State is that a governmental body should not accept or solicit a gift, directly or indirectly, from a donor if the governmental body has reason to believe the donor has or is seeking to obtain contractual or other business or financial relationships with the governmental body. Regulation 19-445.2165(C) broadly defines the term donor.

**2.7.** *Delete Section 3.1.1 and substitute the following:*

**3.1.1** Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement in the number and for the deposit sum, if any, stated therein. If so provided in the Advertisement, the deposit will be refunded to all plan holders who return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded.

**2.8.** *Delete the language of Section 3.1.2 and insert the word "Reserved."*

**2.9.** *In Section 3.1.4, delete the words "and Architect may make" and substitute the words "has made."*

**2.10.** *Insert the following Section 3.1.5*

**3.1.5** All persons obtaining Bidding Documents from the issuing office designated in the Advertisement shall provide that office with Bidder's contact information to include the Bidder's name, telephone number, mailing address, and email address.

**2.11.** *In Section 3.2.2:*

*Delete the words "and Sub-bidders"*

*Delete the word "seven" and substitute the word "ten"*

**2.12.** *In Section 3.2.3:*

*In the first Sentence, insert the word "written" before the word "Addendum."*

*Insert the following at the end of the section:*

As provided in Regulation 19-445.2042(B), nothing stated at the pre-bid conference shall change the Bidding Documents unless a change is made by written Addendum.

**2.13.** *Insert the following at the end of Section 3.3.1:*

Reference in the Bidding Documents to a designated material, product, thing, or service by specific brand or trade name followed by the words "or equal" and "or approved equal" shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition.

**2.14.** *Delete Section 3.3.2 and substitute the following:*

**3.3.2** No request to substitute materials, products, or equipment for materials, products, or equipment described in the Bidding Documents and no request for addition of a manufacturer or supplier to a list of approved manufacturers or suppliers in the Bidding Documents 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 established in the Invitation for Bids. Any subsequent extension of the date for receipt of Bids by addendum shall not extend the date for receipt of such requests unless the addendum so specifies. 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.

**2.15.** *Delete Section 3.4.3 and substitute the following:*

**3.4.3** Addenda will be issued no later than 120 hours prior to the time for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

**OSE FORM 00201****STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

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**2.16. Insert the following Sections 3.4.5 and 3.4.6:**

**3.4.5** When the date for receipt of Bids is to be postponed and there is insufficient time to issue a written Addendum prior to the original Bid Date, Owner will notify prospective Bidders by telephone or other appropriate means with immediate follow up with a written Addendum. This Addendum will verify the postponement of the original Bid Date and establish a new Bid Date. The new Bid Date will be no earlier than the fifth (5th) calendar day after the date of issuance of the Addendum postponing the original Bid Date.

**3.4.6.** If an emergency or unanticipated event interrupts normal government processes so that bids cannot be received at the government office designated for receipt of bids by the exact time specified in the solicitation, the time specified for receipt of bids will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal government processes resume. In lieu of an automatic extension, an Addendum may be issued to reschedule bid opening. If state offices are closed at the time a pre-bid or pre-proposal conference is scheduled, an Addendum will be issued to reschedule the conference. Useful information may be available at: [http://www.scemd.org/scgovweb/weather\\_alert.html](http://www.scemd.org/scgovweb/weather_alert.html)

**2.17. In Section 4.1.1, delete the word “forms” and substitute the words “SE-330 Bid Form.”****2.18. Delete Section 4.1.2 and substitute the following:**

**4.1.2** Any blanks on the bid form to be filled in by the Bidder shall be legibly executed in a non-erasable medium. Bids shall be signed in ink or other indelible media.

**2.19. Delete Section 4.1.3 and substitute the following:**

**4.1.3** Sums shall be expressed in figures.

**2.20. Insert the following at the end of Section 4.1.4:**

Bidder shall not make stipulations or qualify his bid in any manner not permitted on the bid form. An incomplete Bid or information not requested that is written on or attached to the Bid Form that could be considered a qualification of the Bid, may be cause for rejection of the Bid.

**2.21. Delete Section 4.1.5 and substitute the following:**

**4.1.5** All requested Alternates shall be bid. The failure of the bidder to indicate a price for an Alternate shall render the Bid non-responsive. Indicate the change to the Base Bid by entering the dollar amount and marking, as appropriate, the box for “ADD TO” or “DEDUCT FROM”. If no change in the Base Bid is required, enter “ZERO” or “No Change.” For add alternates to the base bid, Subcontractor(s) listed on page BF-2 of the Bid Form to perform Alternate Work shall be used for both Alternates and Base Bid Work if Alternates are accepted.

**2.22. Delete Section 4.1.6 and substitute the following:**

**4.1.6** Pursuant to Title 11, Chapter 35, Section 3020(b)(i) of the South Carolina Code of Laws, as amended, Section 7 of the Bid Form sets forth a list of subcontractor specialties for which Bidder is required to list only the subcontractors Bidder will use to perform the work of each listed specialty. Bidder must follow the Instructions in the Bid Form for filling out this section of the Bid Form. Failure to properly fill out Section 7 may result in rejection of Bidder’s bid as non-responsive.

**2.23. Delete Section 4.1.7 and substitute the following:**

**4.1.7** Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

**2.24. Delete Section 4.2.1 and substitute the following:**

**4.2.1** If required by the Invitation for Bids, each Bid shall be accompanied by a bid security in an amount of not less than five percent of the Base Bid. The bid security shall be a bid bond or a certified cashier’s check. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty.

**OSE FORM 00201****STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

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**2.25. Delete Section 4.2.2 and substitute the following:**

**4.2.2** If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney. The bid bond shall:

- .1** Be issued by a surety company licensed to do business in South Carolina;
- .2** Be issued by a surety company having, at a minimum, a "Best Rating" of "A" as stated in the most current publication of "Best's Key Rating Guide, Property-Casualty", which company shows a financial strength rating of at least five (5) times the contract price.
- .3** Be enclosed in the bid envelope at the time of Bid Opening, either in paper copy or as an electronic bid bond authorization number provided on the Bid Form and issued by a firm or organization authorized by the surety to receive, authenticate and issue binding electronic bid bonds on behalf the surety.

**2.26. Delete Section 4.2.3 and substitute the following:**

**4.2.3** By submitting a bid bond via an electronic bid bond authorization number on the Bid Form and signing the Bid Form, the Bidder certifies that an electronic bid bond has been executed by a Surety meeting the standards required by the Bidding Documents and the Bidder and Surety are firmly bound unto the State of South Carolina under the conditions provided in this Section 4.2.

**2.27. Insert the following Section 4.2.4:**

**4.2.4** The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and performance and payment bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

**2.28. Delete Section 4.3.1 and substitute the following:**

**4.3.1** 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, unless hand delivered by the Bidder, be addressed to the Owner's designated purchasing office as shown in the Invitation for Bids. The envelope 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 or special delivery service (UPS, Federal Express, etc.), the envelope should be labeled "BID ENCLOSED" on the face thereof. Bidders hand delivering their Bids shall deliver Bids to the place of the Bid Opening as shown in the Invitation for Bids. Whether or not Bidders attend the Bid Opening, they shall give their Bids to the Owner's procurement officer or his/her designee as shown in the Invitation for Bids prior to the time of the Bid Opening.

**2.29. Insert the following Section 4.3.6 and substitute the following:**

**4.3.5** The official time for receipt of Bids will be determined by reference to the clock designated by the Owner's procurement officer or his/her designee. The procurement officer conducting the Bid Opening will determine and announce that the deadline has arrived and no further Bids or bid modifications will be accepted. All Bids and bid modifications in the possession of the procurement officer at the time the announcement is completed will be timely, whether or not the bid envelope has been date/time stamped or otherwise marked by the procurement officer.

**2.30. Delete Section 4.4.2 and substitute the following:**

**4.4.2** Prior to the time and date designated for receipt of Bids, a Bid submitted may be withdrawn in person or by written notice to the party receiving Bids at the place designated for receipt of Bids. Withdrawal by written notice shall be in writing over the signature of the Bidder.

**2.31. In Section 5.1, delete everything following the caption "OPENING OF BIDS" and substitute the following:**

**5.1.1** Bids received on time will be publicly opened and will be read aloud. Owner will not read aloud Bids that Owner determines, at the time of opening, to be non-responsive. .

**5.1.2** At bid opening, Owner will announce the date and location of the posting of the Notice of Intended Award.

**5.1.3** Owner will send a copy of the final Bid Tabulation to all Bidders within ten (10) working days of the Bid Opening.



**OSE FORM 00201****STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

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**5.1.4** If Owner determines to award the Project, Owner will, after posting a Notice of Intended Award, send a copy of the Notice to all Bidders.

**5.1.5** If only one Bid is received, Owner will open and consider the Bid.

**2.32.** *In Section 5.2, insert the section number “5.2.1” before the words of the “The Owner” at the beginning of the sentence.*

**2.33.** *Insert the following Sections 5.2.2 and 5.2.3:*

**5.2.2** The reasons for which the Owner will reject Bids include, but are not limited to:

- .1** Failure by a Bidder to be represented at a Mandatory Pre-Bid Conference or site visit;
- .2** Failure to deliver the Bid on time;
- .3** Failure to comply with Bid Security requirements, except as expressly allowed by law;
- .4** Listing an invalid electronic Bid Bond authorization number on the bid form;
- .5** Failure to Bid an Alternate, except as expressly allowed by law;
- .6** Failure to list qualified Subcontractors as required by law;
- .7** Showing any material modification(s) or exception(s) qualifying the Bid;
- .8** Faxing a Bid directly to the Owner or their representative; or
- .9** Failure to include a properly executed Power-of-Attorney with the bid bond.

**5.2.3** The Owner may reject a Bid as nonresponsive if the prices bid are materially unbalanced between line items or sub-line items. A bid is materially unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated in relation to cost for other work, and if there is a reasonable doubt that the bid will result in the lowest overall cost to the Owner even though it may be the low evaluated bid, or if it is so unbalanced as to be tantamount to allowing an advance payment.

**2.34.** *Delete Section 6.1 and substitute the following:*

**6.1 CONTRACTOR'S RESPONSIBILITY**

Owner will make a determination of Bidder's responsibility before awarding a contract. Bidder shall provide all information and documentation requested by the Owner to support the Owner's evaluation of responsibility. Failure of Bidder to provide requested information is cause for the Owner, at its option, to determine the Bidder to be non-responsible

**2.35.** *Delete the language of Section 6.2 and insert the word “Reserved.”*

**2.36.** *Delete the language of Sections 6.3.2, 6.3.3, and 6.3.4 and insert the word “Reserved” after each Section Number.*

**2.37.** *Insert the following Section 6.4*

**6.4 CLARIFICATION**

Pursuant to Section 11-35-1520(8), the Procurement Officer may elect to communicate with a Bidder after opening for the purpose of clarifying either the Bid or the requirements of the Invitation for Bids. Such communications may be conducted only with Bidders who have submitted a Bid which obviously conforms in all material aspects to the Invitation for Bids and only in accordance with Appendix D (Paragraph A(6)) to the Manual for Planning and Execution of State Permanent Improvement, Part II. Clarification of a Bid must be documented in writing and included with the Bid. Clarifications may not be used to revise a Bid or the Invitation for Bids. [Section 11-35-1520(8); R.19-445.2080]

**2.38.** *Delete Section 7.1.2 and substitute the following:*

**7.1.2** The performance and payment bonds shall conform to the requirements of Section 11.4 of the General Conditions of the Contract. If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid.

**2.39.** *Delete the language of Section 7.1.3 and insert the word “Reserved.”*

**2.40.** *In Section 7.2, insert the words “CONTRACT, CERTIFICATES OF INSURANCE” into the caption after the word “Delivery.”*

**OSE FORM 00201****STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS****2.41. Delete Section 7.2.1 and substitute the following:**

**7.2.1** After expiration of the protest period, the Owner will tender a signed Contract for Construction to the Bidder and the Bidder shall return the fully executed Contract for Construction to the Owner within seven days thereafter. The Bidder shall deliver the required bonds and certificate of insurance to the Owner not later than three days following the date of execution of the Contract. Failure to deliver these documents as required shall entitle the Owner to consider the Bidder's failure as a refusal to enter into a contract in accordance with the terms and conditions of the Bidder's Bid and to make claim on the Bid Security for re-procurement cost.

**2.42. Delete the language of Section 7.2.2 and insert the word "Reserved."****2.43. Delete the language of Article 8 and insert the following:**

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on South Carolina Modified AIA Document A101, 2007, Standard Form of Agreement Between Owner and Contractor as modified by OSE Form 00501 – Standard Modification to Agreement Between Owner and Contractor.

**2.44. Insert the following Article 9:****ARTICLE 9 MISCELLANEOUS****9.1 NONRESIDENT TAXPAYER REGISTRATION AFFIDAVIT INCOME TAX WITHHOLDING IMPORTANT TAX NOTICE - NONRESIDENTS ONLY**

Withholding Requirements for Payments to Nonresidents: Section 12-8-550 of the South Carolina Code of Laws requires persons hiring or contracting with a nonresident conducting a business or performing personal services of a temporary nature within South Carolina to withhold 2% of each payment made to the nonresident. The withholding requirement does not apply to (1) payments on purchase orders for tangible personal property when the payments are not accompanied by services to be performed in South Carolina, (2) nonresidents who are not conducting business in South Carolina, (3) nonresidents for contracts that do not exceed \$10,000 in a calendar year, or (4) payments to a nonresident who (a) registers with either the S.C. Department of Revenue or the S.C. Secretary of State and (b) submits a Nonresident Taxpayer Registration Affidavit - Income Tax Withholding, Form I-312 to the person letting the contract.

For information about other withholding requirements (e.g., employee withholding), contact the Withholding Section at the South Carolina Department of Revenue at 803-898-5383 or visit the Department's website at: [www.sctax.org](http://www.sctax.org)

This notice is for informational purposes only. This Owner does not administer and has no authority over tax issues. All registration questions should be directed to the License and Registration Section at 803-898-5872 or to the South Carolina Department of Revenue, Registration Unit, Columbia, S.C. 29214-0140. All withholding questions should be directed to the Withholding Section at 803-898- 5383.

PLEASE SEE THE "NONRESIDENT TAXPAYER REGISTRATION AFFIDAVIT INCOME TAX WITHHOLDING" FORM (FORM NUMBER I-312) LOCATED AT: <http://www.sctax.org/Forms+and+Instructions/withholding/default.htm>.

**9.2 CONTRACTOR LICENSING**

Contractors and Subcontractors listed in Section 7 of the Bid Form who are required by the South Carolina Code of Laws to be licensed, must be licensed at the time of bidding.

**9.3 SUBMITTING CONFIDENTIAL INFORMATION**

For every document Bidder submits in response to or with regard to this solicitation or request, Bidder must separately mark with the word "CONFIDENTIAL" every page, or portion thereof, that Bidder contends contains information that is exempt from public disclosure because it is either (a) a trade secret as defined in Section 30-4-40(a)(1), or (b) privileged & confidential, as that phrase is used in Section 11-35-410. For every document Bidder submits in response to or with regard to this solicitation or request, Bidder must separately mark with the words "TRADE SECRET" every page, or portion thereof, that Bidder contends contains a trade secret as that term is defined by Section 39-8-20 of the Trade Secrets Act. For every document Bidder submits in response to or with regard to this solicitation or request, Bidder must separately mark with the word "PROTECTED" every page, or portion thereof, that Bidder contends is protected by Section 11-35-1810. All markings must be conspicuous; use color, bold, underlining, or some other method in order to conspicuously distinguish the mark from the other text. Do not mark your entire bid as confidential, trade secret, or protected! If your bid, or any part thereof, is improperly marked as confidential or trade

**OSE FORM 00201****STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

secret or protected, the State may, in its sole discretion, determine it nonresponsive. If only portions of a page are subject to some protection, do not mark the entire page. By submitting a response to this solicitation, Bidder (1) agrees to the public disclosure of every page of every document regarding this solicitation or request that was submitted at any time prior to entering into a contract (including, but not limited to, documents contained in a response, documents submitted to clarify a response, & documents submitted during negotiations), unless the page is conspicuously marked "TRADE SECRET" or "CONFIDENTIAL" or "PROTECTED", (2) agrees that any information not marked, as required by these bidding instructions, as a "Trade Secret" is not a trade secret as defined by the Trade Secrets Act, & (3) agrees that, notwithstanding any claims or markings otherwise, any prices, commissions, discounts, or other financial figures used to determine the award, as well as the final contract amount, are subject to public disclosure. In determining whether to release documents, the State will detrimentally rely on Bidders's marking of documents, as required by these bidding instructions, as being either "Confidential" or "Trade Secret" or "PROTECTED". By submitting a response, Bidder agrees to defend, indemnify & hold harmless the State of South Carolina, its officers & employees, from every claim, demand, loss, expense, cost, damage or injury, including attorney's fees, arising out of or resulting from the State withholding information that Bidder marked as "confidential" or "trade secret" or "PROTECTED".

**9.4 POSTING OF INTENT TO AWARD**

Notice of Intent to Award, SE-370, will be posted at the following location:

**Room or Area of Posting:** Lobby

**Building Where Posted:** Facilities Design and Construction

**Address of Building:** 643 Greene Street, Columbia, SC 29208

**WEB site address (if applicable):** <http://purchasing.sc.edu>

**Posting date will be announced at bid opening.** In addition to posting the notice, the Owner will promptly send all responsive bidders a copy of the notice of intent to award and the final bid tabulation

**9.5 PROTEST OF SOLICITATION OR AWARD**

Any prospective bidder, offeror, contractor, or subcontractor who is aggrieved in connection with the solicitation of a contract shall protest within fifteen days of the date of issuance of the applicable solicitation document at issue. Any actual bidder, offeror, contractor, or subcontractor who is aggrieved in connection with the intended award or award of a contract shall protest within ten days of the date notification of intent to award is posted in accordance with Title 11, Chapter 35, Section 4210 of the South Carolina Code of Laws, as amended. A protest shall be in writing, shall set forth the grounds of the protest and the relief requested with enough particularity to give notice of the issues to be decided, and must be received by the State Engineer within the time provided.

Any protest must be addressed to the CPO, Office of State Engineer, and submitted in writing:

(a) by email to [protest-ose@mmo.sc.gov](mailto:protest-ose@mmo.sc.gov),

(b) by facsimile at 803-737-0639, or

(c) by post or delivery to 1201 Main Street, Suite 600, Columbia, SC 29201.

By submitting a protest to the foregoing email address, you (and any person acting on your behalf) consent to receive communications regarding your protest (and any related protests) at the e-mail address from which you sent your protest.

**9.6 SOLICITATION INFORMATION FROM SOURCES OTHER THAN OFFICIAL SOURCE**

South Carolina Business Opportunities (SCBO) is the official state government publication for State of South Carolina solicitations. Any information on State agency solicitations obtained from any other source is unofficial and any reliance placed on such information is at the bidder's sole risk and is without recourse under the South Carolina Consolidated Procurement Code.

**9.7 BUILDER'S RISK INSURANCE**

Bidder's are directed to Article 11.3 of the South Carolina Modified AIA Document A201, 2007 Edition, which, unless provided otherwise in the bid documents, requires the contractor to provide builder's risk insurance on the project.

**OSE FORM 00201****STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS**

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**9.8 TAX CREDIT FOR SUBCONTRACTING WITH MINORITY FIRMS**

Pursuant to Section 12-6-3350, taxpayers, who utilize certified minority subcontractors, may take a tax credit equal to 4% of the payments they make to said subcontractors. The payments claimed must be based on work performed directly for a South Carolina state contract. The credit is limited to a maximum of fifty thousand dollars annually. The taxpayer is eligible to claim the credit for 10 consecutive taxable years beginning with the taxable year in which the first payment is made to the subcontractor that qualifies for the credit. After the above ten consecutive taxable years, the taxpayer is no longer eligible for the credit. The credit may be claimed on Form TC-2, "Minority Business Credit." A copy of the subcontractor's certificate from the Governor's Office of Small and Minority Business (OSMBA) is to be attached to the contractor's income tax return. Taxpayers must maintain evidence of work performed for a State contract by the minority subcontractor. Questions regarding the tax credit and how to file are to be referred to: SC Department of Revenue, Research and Review, Phone: (803) 898-5786, Fax: (803) 898-5888. The subcontractor must be certified as to the criteria of a "Minority Firm" by the Governor's Office of Small and Minority Business Assistance (OSMBA). Certificates are issued to subcontractors upon successful completion of the certification process. Questions regarding subcontractor certification are to be referred to: Governor's Office of Small and Minority Business Assistance, Phone: (803) 734-0657, Fax: (803) 734-2498. Reference: SC §11-35-5010 – Definition for Minority Subcontractor & SC §11-35-5230 (B) – Regulations for Negotiating with State Minority Firms.

**§ 9.9 OTHER SPECIAL CONDITIONS OF THE WORK**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**END OF DOCUMENT**

AIA- A310 (2010)  
Bid Bond

Original AIA Document on file at the office of

Jumper Carter Sease Architects  
412 Meeting Street  
West Columbia, SC 29169  
(803) 791-1020



# SE-330 – LUMP SUM BID BID FORM

2011 Edition  
Rev. 9/21/2011

*Bidders shall submit bids on only Bid Form SE-330.*

**BID SUBMITTED BY:** \_\_\_\_\_

*(Bidder's Name)*

**BID SUBMITTED TO:** University of South Carolina

*(Owner's Name)*

**FOR PROJECT: PROJECT NAME** 1600 Hampton Annex - Deferred Maintenance

**PROJECT NUMBER** H27-6107

## **OFFER**

§ 1. In response to the Invitation for Construction Bids and in compliance with the Instructions to Bidders for the above-named Project, the undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Contract with the Owner on the terms included in the Bidding Documents, and to perform all Work as specified or indicated in the Bidding Documents, for the prices and within the time frames indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

§ 2. Pursuant to Section 11-32-3030(1) of the SC Code of Laws, as amended, Bidder has submitted Bid Security as follows in the amount and form required by the Bidding Documents:

☐ Bid Bond with Power of Attorney    ☐ Electronic Bid Bond    ☐ Cashier's Check

*(Bidder check one)*

§ 3. Bidder acknowledges the receipt of the following Addenda to the Bidding Documents and has incorporated the effects of said Addenda into this Bid:

**ADDENDUM No:** \_\_\_\_\_

§ 4. Bidder accepts all terms and conditions of the Invitation for Bids, including, without limitation, those dealing with the disposition of Bid Security. Bidder agrees that this Bid, including all Bid Alternates, if any, may not be revoked or withdrawn after the opening of bids, and shall remain open for acceptance for a period of 60 Days following the Bid Date, or for such longer period of time that Bidder may agree to in writing upon request of the Owner.

§ 5. Bidder herewith offers to provide all labor, materials, equipment, tools of trades and labor, accessories, appliances, warranties and guarantees, and to pay all royalties, fees, permits, licenses and applicable taxes necessary to complete the following items of construction work:

**§ 6.1 BASE BID WORK** *(as indicated in the Bidding Documents and generally described as follows):* Demolition and installation of new systems including architectural, plumbing, mechanical, electrical, and fire alarm. Asbestos abatement by Owner. Small and minority business participation is encouraged.,

\_\_\_\_\_, which sum is hereafter called the Base Bid.

*(Bidder - insert Base Bid Amount on line above)*

# SE-330 – LUMP SUM BID BID FORM

2011 Edition  
Rev. 9/21/2011

§ 6.2 BID ALTERNATES - as indicated in the Bidding Documents and generally described as follows:

**ALTERNATE # 1** (Brief Description): Include the amount to be added to the Base Bid to remove existing plumbing lift station and replace with new as indicated in the plumbing drawings.

☐ ADD TO or ☐ DEDUCT FROM BASE BID: \_\_\_\_\_

(Bidder to Mark appropriate box to clearly indicate the price adjustment offered for each alternate)

**ALTERNATE # 2** (Brief Description): N/A

☐ ADD TO or ☐ DEDUCT FROM BASE BID: \_\_\_\_\_

(Bidder to Mark appropriate box to clearly indicate the price adjustment offered for each alternate)

**ALTERNATE # 3** (Brief Description): N/A

☐ ADD TO or ☐ DEDUCT FROM BASE BID: \_\_\_\_\_

(Bidder to Mark appropriate box to clearly indicate the price adjustment offered for each alternate)



**SE-330 – LUMP SUM BID****BID FORM**

**§ 7. LISTING OF PROPOSED SUBCONTRACTORS PURSUANT TO SECTION 3020(b)(i), CHAPTER 35, TITLE 11 OF THE SOUTH CAROLINA CODE OF LAWS, AS AMENDED – (See Instructions on the following page BF-2A)**

Bidder shall use the below-listed Subcontractors in the performance of the Subcontractor Specialty work listed:

<b>SUBCONTRACTOR SPECIALTY By License Classification and/or Subclassification (Completed by Owner)</b>	<b>SUBCONTRACTOR'S PRIME CONTRACTOR'S NAME (Must be completed by Bidder) BASE BID</b>	<b>SUBCONTRACTOR'S PRIME CONTRACTOR'S SC LICENSE NUMBER</b>
<b>ALTERNATE 1</b>		
<b>ALTERNATE 2</b>		
<b>ALTERNATE 3</b>		

If a Bid Alternate is accepted, Subcontractors listed for the Bid Alternate shall be used for the work of both the Alternate and the Base Bid work.

## **INSTRUCTIONS FOR SUBCONTRACTOR LISTING**

1. Section 7 of the Bid Form sets forth a list of subcontractor specialties for which bidder is required to identify by name the subcontractor(s) Bidder will use to perform the work of each listed specialty. Bidder must identify only the subcontractor(s) who will perform the work and no others.
2. For purposes of subcontractor listing, a Subcontractor is an entity who will perform work or render service to the prime contractor to or about the construction site. Material suppliers, manufacturers, and fabricators that will not perform physical work at the site of the project but will only supply materials or equipment to the bidder or proposed subcontractor(s) are not subcontractors and Bidder should not insert their names in the spaces provided on the bid form. Likewise, Bidder should not insert the names of sub-subcontractors in the spaces provided on the bid form but only the names of those entities with which bidder will contract directly.
3. Bidder must only insert the names of subcontractors who are qualified to perform the work of the listed specialties as specified in the Bidding Documents and South Carolina Licensing Laws.
4. If under the terms of the Bidding Documents, Bidder is qualified to perform the work of a specialty listed and Bidder does not intend to subcontract such work but to use Bidder's own employees to perform such work, the Bidder must insert its own name in the space provided for that specialty.
5. If Bidder intends to use multiple subcontractors to perform the work of a single specialty listing, Bidder must insert the name of each subcontractor Bidder will use, preferably separating the name of each by the word **"and"**. If Bidder intends to use both his own employees to perform a part of the work of a single specialty listing and to use one or more subcontractors to perform the remaining work for that specialty listing, bidder must insert his own name and the name of each subcontractor, preferably separating the name of each with the word **"and"**.
6. Bidder may not list subcontractors in the alternative nor in a form that may be reasonably construed at the time of bid opening as a listing in the alternative. A listing that requires subsequent explanation to determine whether or not it is a listing in the alternative is non-responsive. If bidder intends to use multiple entities to perform the work for a single specialty listing, bidder must clearly set forth on the bid form such intent. Bidder may accomplish this by simply inserting the word **"and"** between the name of each entity listed for that specialty. Owner will reject as non-responsive a listing that contains the names of multiple subcontractors separated by a blank space, the word "or", a virgule (that is a /), or any separator that the Owner may reasonably interpret as a listing in the alternative.
7. If Bidder is awarded the contract, bidder must, except with the approval of the owner for good cause shown, use the listed entities to perform the work for which they are listed.
8. If bidder is awarded the contract, bidder will not be allowed to substitute another entity as subcontractor in place of a subcontractor listed in Section 7 of the Bid except for one or more of the reasons allowed by the SC Code of Laws.
9. Bidder's failure to insert a name for each listed specialty subcontractor will render the Bid non-responsive.

## **SE-330 – LUMP SUM BID BID FORM**

**§ 8. LIST OF MANUFACTURERS, MATERIAL SUPPLIERS, AND SUBCONTRACTORS OTHER THAN SUBCONTRACTORS LISTED IN SECTION 7 ABOVE (FOR INFORMATION ONLY):** Pursuant to instructions in the Invitation for Bids, if any, Bidder will provide to Owner upon the Owner's request and within 24 hours of such request, a listing of manufacturers, material suppliers, and subcontractors, other than those listed in Section 7 above, that Bidder intends to use on the project. Bidder acknowledges and agrees that this list is provided for purposes of determining responsibility and not pursuant to the subcontractor listing requirements of SC Code Ann § 11-35-3020(b)(i).

### **§ 9. TIME OF CONTRACT PERFORMANCE AND LIQUIDATED DAMAGES**

a. **CONTRACT TIME:** Bidder agrees that the Date of Commencement of the Work shall be established in a Notice to Proceed to be issued by the Owner. Bidder agrees to substantially complete the Work within **84** calendar days from the Date of Commencement, subject to adjustments as provided in the Contract Documents.

b. **LIQUIDATED DAMAGES:** Bidder further agrees that from the compensation to be paid, the Owner shall retain as Liquidated Damages the sum of \$250.00 for each calendar day the actual construction time required to achieve Substantial Completion exceeds the specified or adjusted time for Substantial Completion as provided in the Contract Documents. This sum is intended by the parties as the predetermined measure of compensation for actual damages, not as a penalty for nonperformance.

### **§ 10. AGREEMENTS**

- a. Bidder agrees that this bid is subject to the requirements of the law of the State of South Carolina.
- b. Bidder agrees that at any time prior to the issuance of the Notice to Proceed for this Project, this Project may be canceled for the convenience of, and without cost to, the State.
- c. Bidder agrees that neither the State of South Carolina nor any of its agencies, employees or agents shall be responsible for any bid preparation costs, or any costs or charges of any type, should all bids be rejected or the Project canceled for any reason prior to the issuance of the Notice to Proceed.

### **§ 11. ELECTRONIC BID BOND**

By signing below, the Principal is affirming that the identified electronic bid bond has been executed and that the Principal and Surety are firmly bound unto the State of South Carolina under the terms and conditions of the AIA Document A310, Bid Bond, included in the Bidding Documents.

**Electronic Bid Bond Number:** \_\_\_\_\_

**Signature and Title:** \_\_\_\_\_

**SE-330 – LUMP SUM BID  
BID FORM**

**2011 Edition**  
Rev. 9/21/2011

**BIDDER'S TAXPAYER IDENTIFICATION**

FEDERAL EMPLOYER'S IDENTIFICATION NUMBER: \_\_\_\_\_

*OR*

SOCIAL SECURITY NUMBER: \_\_\_\_\_

**CONTRACTOR'S CLASSIFICATIONS AND SUBCLASSIFICATIONS WITH LIMITATIONS**

*Classification(s) & Limits:* \_\_\_\_\_

*Subclassification(s) & Limits:* \_\_\_\_\_

*SC Contractor's License Number(s):* \_\_\_\_\_

BY SIGNING THIS BID, THE PERSON SIGNING REAFFIRMS ALL REPRESENTATIONS AND CERTIFICATIONS MADE BY BOTH THE PERSON SIGNING AND THE BIDDER, INCLUDING WITHOUT LIMITATION, THOSE APPEARING IN ARTICLE 2 OF THE INSTRUCTIONS TO BIDDER. THE INVITATION FOR BIDS, AS DEFINED IN THE INSTRUCTIONS TO BIDDERS, IS EXPRESSLY INCORPORATE BY REFERENCE.

**SIGNATURE**

**BIDDER'S LEGAL NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_  
\_\_\_\_\_

**BY:** \_\_\_\_\_  
(Signature)

**DATE:** \_\_\_\_\_

**TITLE:** \_\_\_\_\_

**TELEPHONE:** \_\_\_\_\_

**EMAIL:** \_\_\_\_\_

**AIA- A101 (2007)**  
Standard Form of Agreement Between  
Owner and Contractor

Original AIA Document on file at the office of

Jumper Carter Sease Architects  
412 Meeting Street  
West Columbia, SC 29169  
(803) 791-1020



**2011 Edition**  
Rev. 12/02/2013

**OSE FORM 00501**  
**STANDARD MODIFICATIONS TO AGREEMENT BETWEEN**  
**OWNER AND CONTRACTOR**

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**OWNER:** University of South Carolina

**PROJECT NUMBER:** H27-6107

**PROJECT NAME:** 1600 Hampton Annex - Deferred Maintenance

**1. STANDARD MODIFICATIONS TO AIA A101-2007**

**1.1.** These Standard Modifications amend or supplement the *Standard Form of Agreement Between Owner and Contractor* (AIA Document A101-2007) and other provisions of Bidding and Contract Documents as indicated below.

**1.2.** All provisions of A101-2007, which are not so amended or supplemented, remain in full force and effect.

**2. MODIFICATIONS TO A101**

**2.1.** *Insert the following at the end of Article 1:*

Any reference in this document to the Agreement between the Owner and Contractor, AIA Document A101, or some abbreviated reference thereof, shall mean the AIA A101, 2007 Edition as modified by OSE Form 00501 – Standard Modification to Agreement Between Owner and Contractor. Any reference in this document to the General Conditions of the Contract for Construction, AIA Document A201, or some abbreviated reference thereof, shall mean the AIA A201, 2007 Edition as modified by OSE Form 00811 – Standard Supplementary Conditions.

**2.2.** *Delete Section 3.1 and substitute the following:*

**3.1** The Date of Commencement of the Work shall be the date fixed in a Notice to Proceed issued by the Owner. The Owner shall issue the Notice to Proceed to the Contractor in writing, no less than seven days prior to the Date of Commencement. Unless otherwise provided elsewhere in the contract documents, and provided the contractor has secured all required insurance and surety bonds, the contractor may commence work immediately after receipt of the Notice to Proceed.

**2.3.** *Delete Section 3.3 and substitute the following:*

**3.3** The Contract Time shall be measured from the Date of Commencement as provided in Section 9(a) of the Bid Form (SE-330) for this Project. Contractor agrees that if the Contractor fails to achieve Substantial Completion of the Work within the Contract Time, the Owner shall be entitled to withhold or recover from the Contractor liquidated damages in the amounts set forth in Section 9(b) of the Bid Form (SE-330), subject to adjustments of this Contract Time as provided in the Contract Documents.

**2.4.** *In Section 5.1.1, insert the words “and Owner” after the phrase “Payment submitted to the Architect.”*

**2.5.** *Delete Section 5.1.3 and substitute the following:*

**5.1.3** The Owner shall make payment of the certified amount to the Contractor not later than 21 days after receipt of the Application for Payment.

**2.6.** *In Section 5.1.6, Insert the following after the phrase “Subject to other provisions of the Contract Documents”:*

and subject to Title 12, Chapter 8, Section 550 of the South Carolina Code of Laws, as amended  
(Withholding Requirements for Payments to Non-Residents)

*In the spaces provided in Sub-Sections 1 and 2 for inserting the retainage amount, insert “three and one-half percent (3.5%).”*

**OSE FORM 00501****STANDARD MODIFICATIONS TO AGREEMENT BETWEEN  
OWNER AND CONTRACTOR**

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**2.7.** *In Section 5.1.8, delete the word “follows” and the colon and substitute the following:*

set forth in S.C. Code Ann. § 11-35-3030(4).

**2.8.** *In Section 5.1.9, delete the words “Except with the Owner’s prior approval, the” before the word “Contractor.”*

**2.9.** *In Section 5.2.2, delete the number 30 and substitute the number 21, delete everything following the words “Certificate for Payment” and place a period at the end of the resulting sentence.*

**2.10.** *Delete the language of Sections 6.1 and 6.2 and substitute the word “Reserved” for the deleted language of each Section .*

**2.11.** *Delete the language of Section 8.2 and substitute the word “Reserved.”*

**2.12.** *In Section 8.3, make the word “Representative” in the title plural, delete everything following the title, and substitute the following:*

**8.3.1** Owner designates the individual listed below as its Senior Representative (“Owner's Senior Representative”), which individual has the responsibility for and, subject to Section 7.2.1 of the General Conditions, the authority to resolve disputes under Section 15.6 of the General Conditions:

**Name:** Tom Opal

**Title:** Sr. Project Manager

**Address:** 743 Greene Street, Columbia, SC 29208

**Telephone:** (803) 777-7076 **FAX:** (803) 777-8739

**Email:** tnopal@fmc.sc.edu

**8.3.2** Owner designates the individual listed below as its Owner's Representative, which individual has the authority and responsibility set forth in Section 2.1.1 of the General Conditions:

**Name:** Christian Mergner

**Title:** Project Manager

**Address:** 743 Greene Street, Columbia, SC 29208

**Telephone:** (803) 777-4569 **FAX:** (803) 777-8729

**Email:** CMERGNER@fmc.sc.edu

**2.13.** *In Section 8.4, make the word “Representative” in the title plural, delete everything following the title, and substitute the following:*

**8.4.1** Contractor designates the individual listed below as its Senior Representative (“Contractor's Senior Representative”), which individual has the responsibility for and authority to resolve disputes under Section 15.6 of the General Conditions:

**Name:** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Telephone:** \_\_\_\_\_ **FAX:** \_\_\_\_\_

**Email:** \_\_\_\_\_



**STANDARD MODIFICATIONS TO AGREEMENT BETWEEN  
OWNER AND CONTRACTOR**

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**8.4.2** Contractor designates the individual listed below as its Contractor's Representative, which individual has the authority and responsibility set forth in Section 3.1.1 of the General Conditions:

**Name:** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Telephone:** \_\_\_\_\_ **FAX:** \_\_\_\_\_

**Email:** \_\_\_\_\_

- 2.14.** *Add the following Section 8.6.1:*

**8.6.1** The Architect's representative:

**Name:** Darryn Bouknight, AIA, LEED <sup>AP</sup>, Jumper Carter Sease/Architects, P.A.

**Title:** Architect

**Address:** 412 Meeting Street, West Columbia, SC 29169

**Telephone:** (803) 791-1020 **FAX:** (803) 791-1022

**Email:** [dbouknight@jcsarchitects.com](mailto:dbouknight@jcsarchitects.com)

- 2.15.** *In Section 9.1.7, Sub-Section 2, list the following documents in the space provided for listing documents:*

Invitation for Construction Bids (SE-310)

Instructions to Bidders (AIA Document A701-1997)

Standard Supplemental Instructions to Bidders (OSE Form 00201)

Contractor's Bid (Completed SE-330)

Notice of Intent to Award (Completed SE-370)

Certificate of procurement authority issued by the SC Budget & Control Board

- 2.16.** *In Article 10, delete everything after the first sentence.*

**END OF DOCUMENT**



**AIA- A201 (2007)**  
General Conditions of the Contract  
for Construction

Original AIA Document on file at the office of

Jumper Carter Sease Architects  
412 Meeting Street  
West Columbia, SC 29169  
(803) 791-1020



**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**OWNER:** University of South Carolina**PROJECT NUMBER:** H27-6107**PROJECT NAME:** 1600 Hampton Annex - Deferred Maintenance**1 GENERAL CONDITIONS**

The *General Conditions of the Contract for Construction*, AIA Document A201, 2007 Edition, Articles 1 through 15 inclusive, is a part of this Contract and is incorporated as fully as if herein set forth. For brevity, AIA Document A201 is also referred to in the Contract Documents collectively as the "General Conditions."

**2 STANDARD SUPPLEMENTARY CONDITIONS**

**2.1** The following supplements modify, delete and/or add to the General Conditions. Where any portion of the General Conditions is modified or any paragraph, Section or clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of the General Conditions shall remain in effect.

**2.2** Unless otherwise stated, the terms used in these Standard Supplementary Conditions which are defined in the General Conditions have the meanings assigned to them in the General Conditions.

**3 MODIFICATIONS TO A201-2007**

**3.1** *Insert the following at the end of Section 1.1.1:*

Any reference in this document to the Agreement between the Owner and Contractor, AIA Document A101, or some abbreviated reference thereof, shall mean the AIA A101, 2007 Edition as modified by OSE Form 00501 – Standard Modification to Agreement Between Owner and Contractor. Any reference in this document to the General Conditions of the Contract for Construction, AIA Document A201, or some abbreviated reference thereof, shall mean the AIA A201, 2007 Edition as modified by OSE Form 00811 – Standard Supplementary Conditions.

**3.2** *Delete the language of Section 1.1.8 and substitute the word "Reserved."*

**3.3** *Add the following Section 1.1.9:*

**1.1.9 NOTICE TO PROCEED**

Notice to Proceed is a document issued by the Owner to the Contractor, with a copy to the Architect, directing the Contractor to begin prosecution of the Work in accordance with the requirements of the Contract Documents. The Notice to Proceed shall fix the date on which the Contract Time will commence.

**3.4** *Insert the following at the end of Section 1.2.1:*

In the event of patent ambiguities within or between parts of the Contract Documents, the contractor shall 1) provide the better quality or greater quantity of Work, or 2) comply with the more stringent requirement, either or both in accordance with the Architect's interpretation.

**3.5** *Delete Section 1.5.1 and substitute the following:*

**1.5.1** The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as a violation of the Architect's or Architect's consultants' reserved rights.

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**3.6** *Delete Section 2.1.1 and substitute the following:*

**2.1.1** The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization, except as provided in Section 7.1.2. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's Representative. [Reference § 8.2 of the Agreement.]

**3.7** *Delete Section 2.1.2 and substitute the following:*

**2.1.2** The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to post Notice of Project Commencement pursuant to Title 29, Chapter 5, Section 23 of the South Carolina Code of Laws, as amended..

**3.8** *Delete Section 2.2.3 and substitute the following:*

**2.2.3** The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. Subject to the Contractor's obligations, including those in Section 3.2, the Contractor shall be entitled to rely on the accuracy of information furnished by the Owner pursuant to this Section but shall exercise proper precautions relating to the safe performance of the Work.

**3.9** *Replace the period at the end of the last sentence of Section 2.2.4 with a semicolon and insert the following after the inserted semicolon:*

"however, the Owner does not warrant the accuracy of any such information requested by the Contractor that is not otherwise required of the Owner by the Contract Documents. Neither the Owner nor the Architect shall be required to conduct investigations or to furnish the Contractor with any information concerning subsurface characteristics or other conditions of the area where the Work is to be performed beyond that which is provide in the Contract Documents."

**3.10** *Delete Section 2.2.5 and substitute the following:*

**2.2.5** Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor with ten copies of the Contract Documents. The Contractor may make reproductions of the Contract Documents pursuant to Section 1.5.2. All copies of the drawings and specifications, except the Contractor's record set, shall be returned or suitably accounted for to the Owner, on request, upon completion of the Work.

**3.11** *Add the following Sections 2.2.6 and 2.2.7:*

**2.2.6** The Owner assumes no responsibility for any conclusions or interpretation made by the Contractor based on information made available by the Owner.

**2.2.7** The Owner shall obtain, at its own cost, general building and specialty inspection services as required by the Contract Documents. The Contractor shall be responsible for payment of any charges imposed for reinspections.

**3.12** *Delete Section 2.4 and substitute the following:*

**2.4** If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect, including but not limited to providing necessary resources, with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Directive shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**3.13** *Insert the following at the end of Section 3.2.1:*

The Contractor acknowledges that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Owner, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Owner.

**3.14** *In the third sentence of Section 3.2.4, insert the word “latent” before the word “errors.”***3.15** *In the last sentence of Section 3.3.1, insert the words “by the Owner in writing” after the word “instructed.”***3.16** *Delete the third sentence of Section 3.5 and substitute the following sentences:*

Work, materials, or equipment not conforming to these requirements shall be considered defective. Unless caused by the Contractor or a subcontractor at any tier, the Contractor’s warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage.

**3.17** *Insert the following at the end of Section 3.6:*

The Contractor shall comply with the requirements of Title 12, Chapter 9 of the South Carolina Code of Laws, as amended, regarding withholding tax for nonresidents, employees, contractors and subcontractors.

**3.18** *In Section 3.7.1, delete the words “the building permit as well as for other” and insert the following sentence at the end of this section:*

Pursuant to Title 10, Chapter 1, Section 180 of the South Carolina Code of Laws, as amended, no local general or specialty building permits are required for state buildings.

**3.19** *Delete the last sentence of Section 3.7.5 and substitute the following:*

Adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 7.3.3.

**3.20** *Delete the last sentence of Section 3.8.2.3 and substitute the following:*

The amount of the Change Order shall reflect the difference between actual costs, as documented by invoices, and the allowances under Section 3.8.2.1.

**3.21** *In Section 3.9.1, insert a comma after the word “superintendent” in the first sentence and insert the following after the inserted comma:*

acceptable to the Owner,

**3.22** *Delete Section 3.9.2 and substitute the following:*

**3.9.2** The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner the name and qualifications of a proposed superintendent. The Owner may reply within 14 days to the Contractor in writing stating (1) whether the Owner has reasonable objection to the proposed superintendent or (2) that the

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

Owner requires additional time to review. Failure of the Owner to reply within the 14-day period shall constitute notice of no reasonable objection.

**3.23** *After the first sentence in Section 3.9.3, insert the following sentence:*

The Contractor shall notify the Owner, in writing, of any proposed change in the superintendent, including the reason therefore, prior to making such change.

**3.24** *Delete Section 3.10.3 and substitute the following:*

**3.10.3** Additional requirements, if any, for the constructions schedule are as follows:  
(Check box if applicable to this Contract))

☐ The construction schedule shall be in a detailed precedence-style critical path management (CPM) or primavera-type format satisfactory to the Owner and the Architect that shall also (1) provide a graphic representation of all activities and events that will occur during performance of the work; (2) identify each phase of construction and occupancy; and (3) set forth dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents (hereinafter referred to as "Milestone Dates"). Upon review and acceptance by the Owner and the Architect of the Milestone Dates, the construction schedule shall be deemed part of the Contract Documents and attached to the Agreement as Exhibit "A." If not accepted, the construction schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Owner and the Architect and resubmitted for acceptance. The Contractor shall monitor the progress of the Work for conformance with the requirements of the construction schedule and shall promptly advise the Owner of any delays or potential delays. Whenever the approved construction schedule no longer reflects actual conditions and progress of the work or the Contract Time is modified in accordance with the terms of the Contract Documents, the Contractor shall update the accepted construction schedule to reflect such conditions. In the event any progress report indicates any delays, the Contractor shall propose an affirmative plan to correct the delay, including overtime and/or additional labor, if necessary. In no event shall any progress report constitute an adjustment in the Contract Time, any Milestone Date, or the Contract Sum unless any such adjustment is agreed to by the Owner and authorized pursuant to Change Order.

**3.25** *Add the following Section 3.10.4:*

**3.10.4** Owner's review and acceptance of Contractor's schedule is not conducted for the purpose of either determining its accuracy and completeness or approving the construction means, methods, techniques, sequences or procedures. The Owner's approval shall not relieve the Contractor of any obligations. Unless expressly addressed in a Modification, the Owner's approval of a schedule shall not change the Contract Time.

**3.26** *Add the following Section 3.12.5.1:*

**3.12.5.1** The fire sprinkler shop drawings shall be prepared by a licensed fire sprinkler contractor and shall accurately reflect actual conditions affecting the required layout of the fire sprinkler system. The fire sprinkler contractor shall certify the accuracy of his shop drawings prior to submitting them for review and approval. The fire sprinkler shop drawings shall be reviewed and approved by the Architect's engineer of record who, upon approving the sprinkler shop drawings will submit them to the State Fire Marshal or other authorities having jurisdiction for review and approval. The Architect's engineer of record will submit a copy of the State Fire Marshal's approval letter to the Contractor, Architect, and OSE. Unless authorized in writing by OSE, neither the Contractor nor subcontractor at any tier shall submit the fire sprinkler shop drawings directly to the State Fire Marshal or other authorities having jurisdiction for approval.

**3.27** *In the fourth sentence of Section 3.12.10, after the comma following the words "licensed design professional," insert the following:*

who shall comply with reasonable requirements of the Owner regarding qualifications and insurance and

**3.28** *In Section 3.13, insert the section number "3.13.1" before the opening words "The Contractors shall."*



**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**3.29** Add the following Sections 3.13.2 and 3.13.3:

**3.13.2** Protection of construction materials and equipment stored at the Project site from weather, theft, vandalism, damage, and all other adversity is solely the responsibility of the Contractor. The Contractor shall perform the work in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of the Work shall be free from all debris, building materials, and equipment likely to cause hazardous conditions.

**3.13.3** The Contractor and any entity for whom the Contractor is responsible shall not erect any sign on the Project site without the prior written consent of the Owner.

**3.30** *In the first sentence of Section 3.18.1, after the parenthetical “...(other than the Work itself),...” and before the word “...but...”, insert the following:*

including loss of use resulting therefrom,

**3.31** *Delete Section 4.1.1 and substitute the following:*

**4.1.1** The Architect is that person or entity identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

**3.32** *Insert the following at the end of Section 4.2.1:*

Any reference in the Contract Documents to the Architect taking action or rendering a decision with a “reasonable time” is understood to mean no more than fourteen days, unless otherwise specified in the Contract Documents or otherwise agreed to by the parties.

**3.33** *Delete the first sentence of Section 4.2.2 and substitute the following:*

The Architect will visit the site as necessary to fulfill its obligation to the Owner for inspection services, if any, and, at a minimum, to assure conformance with the Architect’s design as shown in the Contract Documents and to observe the progress and quality of the various components of the Contractor’s Work, and to determine if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents.

**3.34** *Delete the first sentence of Section 4.2.3 and substitute the following:*

On the basis of the site visits, the Architect will keep the Owner informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work.

**3.35** *In Section 4.2.5, after the words “evaluations of the” and before the word “Contractor’s,” insert the following:*

Work completed and correlated with the

**3.36** *Delete the first sentence of Section 4.2.11 and substitute the following:*

**4.2.11** The Architect will, in the first instance, interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. Upon receipt of such request, the Architect will promptly provide the non-requesting party with a copy of the request.

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**3.37** *Insert the following at the end of Section 4.2.12:*

If either party disputes the Architects interpretation or decision, that party may proceed as provided in Article 15. The Architect's interpretations and decisions may be, but need not be, accorded any deference in any review conducted pursuant to law or the Contract Documents.

**3.38** *Delete Section 4.2.14 and substitute the following:*

The Architect will review and respond to requests for information about the Contract Documents so as to avoid delay to the construction of the Project. The Architect's response to such requests will be made in writing with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information. Any response to a request for information must be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. Unless issued pursuant to a Modification, supplemental Drawings or Specifications will not involve an adjustment to the Contract Sum or Contract Time.

**3.39** *Delete Section 5.2.1 and substitute the following:*

**5.2.1** Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, within fourteen days after posting of the Notice of Intent to Award the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (excluding Listed Subcontractors but including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Owner may reply within 14 days to the Contractor in writing stating (1) whether the Owner has reasonable objection to any such proposed person or entity. Failure of the Owner to reply within the 14 day period shall constitute notice of no reasonable objection.

**3.40** *Delete Section 5.2.2 and substitute the following:*

**5.2.2** The Contractor shall not contract with a proposed person or entity to whom the Owner has made reasonable and timely objection. The Owner shall not direct the Contractor to contract with any specific individual or entity for supplies or services unless such supplies and services are necessary for completion of the Work and the specified individual or entity is the only source of such supply or services.

**3.41** *In the first sentence of Section 5.2.3, delete the words "...or Architect..." in the two places they appear.***3.42** *Delete the words "...or Architect..." in the in the first sentence of Section 5.2.4 and insert the following sentence at the end of Section 5.2.4:*

The Contractor's request for substitution must be made to the Owner in writing accompanied by supporting information.

**3.43** *Add the following Section 5.2.5:*

**5.2.5** A Subcontractor identified in the Contractor's Bid in response the specialty subcontractor listing requirements of Section 7 of the Bid Form (SE-330) may only be substituted in accordance with and as permitted by the provisions of Title 11, Chapter 35, Section 3021 of the South Carolina Code of Laws, as amended. A proposed substitute for a Listed Subcontractor shall be subject to the Owner's approval as set forth in Section 5.2.3.

**3.44** *In Section 5.3, delete everything following the heading "SUBCONTRACTUAL RELATIONS" and insert the following Sections 5.3.1, 5.3.2, 5.3.3, and 5.3.4:*

**5.3.1** By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise herein or in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.3.2 Without limitation on the generality of Section 5.3.1, each Subcontract agreement and each Sub-subcontract agreement shall include, and shall be deemed to include, the following Sections of these General Conditions: 3.2, 3.5, 3.18, 5.3, 5.4, 6.2.2, 7.3.3, 7.5, 7.6, 13.1, 13.12, 14.3, 14.4, and 15.1.6.

§ 5.3.3 Each Subcontract Agreement and each Sub-subcontract agreement shall exclude, and shall be deemed to exclude, Sections 13.2.1 and 13.6 and all of Article 15, except Section 15.1.6, of these General Conditions. In the place of these excluded sections of the General Conditions, each Subcontract Agreement and each Sub-subcontract may include Sections 13.2.1 and 13.6 and all of Article 15, except Section 15.1.6, of AIA Document A201-2007, Conditions of the Contract, as originally issued by the American Institute of Architects.

§ 5.3.4 The Contractor shall assure the Owner that all agreements between the Contractor and its Subcontractor incorporate the provisions of Subparagraph 5.3.1 as necessary to preserve and protect the rights of the Owner and the Architect under the Contract Documents with respect to the work to be performed by Subcontractors so that the subcontracting thereof will not prejudice such rights. The Contractor's assurance shall be in the form of an affidavit or in such other form as the Owner may approve. Upon request, the Contractor shall provide the Owner or Architect with copies of any or all subcontracts or purchase orders.

**3.45** *Delete the last sentence of Section 5.4.1.*

**3.46** *Add the following Sections 5.4.4, 5.4.5 and 5.4.6:*

§ 5.4.4 Each subcontract shall specifically provide that the Owner shall only be responsible to the subcontractor for those obligations of the Contractor that accrue subsequent to the Owner's exercise of any rights under this conditional assignment.

§ 5.4.5 Each subcontract shall specifically provide that the Subcontractor agrees to perform portions of the Work assigned to the Owner in accordance with the Contract Documents.

§ 5.4.6 Nothing in this Section 5.4 shall act to reduce or discharge the Contractor's payment bond surety's obligations to claimants for claims arising prior to the Owner's exercise of any rights under this conditional assignment.

**3.47** *Delete the language of Section 6.1.4 and substitute the word "Reserved."*

**3.48** *Insert the following at the end of Section 7.1.2:*

If the amount of a Modification exceeds the limits of the Owner's Construction Change Order Certification (reference Section 9.1.7.2 of the Agreement), then the Owner's agreement is not effective, and Work may not proceed, until approved in writing by the Office of State Engineer.

**3.49** *Delete Section 7.2.1 and substitute the following:*

**7.2.1** A Change Order is a written instrument prepared by the Architect (using State Form SE-480 "Construction Change Order") and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

- .1** The change in the Work;

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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- .2** The amount of the adjustment, if any, in the Contract Sum; and
- .3** The extent of the adjustment, if any, in the Contract Time.

**3.50** *Add the following Sections 7.2.2, 7.2.3, 7.2.4, and 7.2.5:*

**7.2.2** If a Change Order provides for an adjustment to the Contract Sum, the adjustment must be calculated in accordance with Section 7.3.3.

**7.2.3** At the Owner's request, the Contractor shall prepare a proposal to perform the work of a proposed Change Order setting forth the amount of the proposed adjustment, if any, in the Contract Sum; and the extent of the proposed adjustment, if any, in the Contract Time. Any proposed adjustment in the Contract sum shall be prepared in accordance with Section 7.2.2. The Owner's request shall include any revisions to the Drawings or Specifications necessary to define any changes in the Work. Within fifteen days of receiving the request, the Contractor shall submit the proposal to the Owner and Architect along with all documentation required by Section 7.6.

**7.2.4** If the Contractor requests a Change Order, the request shall set forth the proposed change in the Work and shall be prepared in accordance with Section 7.2.3. If the Contractor requests a change to the Work that involves a revision to either the Drawings or Specifications, the Contractor shall reimburse the Owner for any expenditures associated with the Architects' review of the proposed revisions, except to the extent the revisions are accepted by execution of a Change Order.

**7.2.5** Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, any adjustments to the Contract Sum or the Contract Time.

**3.51** *Delete 7.3.3 and substitute the following:***7.3.3 PRICE ADJUSTMENTS**

**§ 7.3.3.1** If any Modification, including a Construction Change Directive, provides for an adjustment to the Contract Sum, the adjustment shall be based on whichever of the following methods is the most valid approximation of the actual cost to the contractor, with overhead and profit as allowed by Section 7.5:

- .1** Mutual acceptance of a lump sum;
- .2** Unit prices stated in the Contract Documents, except as provided in Section 7.3.4, or subsequently agreed upon;
- .3** Cost attributable to the events or situations under applicable clauses with adjustment of profits or fee, all as specified in the contract, or subsequently agreed upon by the parties, or by some other method as the parties may agree; or
- .4** As provided in Section 7.3.7.

**§ 7.3.3.2** Consistent with Section 7.6, costs must be properly itemized and supported by substantiating data sufficient to permit evaluation before commencement of the pertinent performance or as soon after that as practicable. All costs incurred by the Contractor must be justifiably compared with prevailing industry standards. Except as provided in Section 7.5, all adjustments to the Contract Price shall be limited to job specific costs and shall not include indirect costs, overhead, home office overhead, or profit.

**3.52** *Delete Section 7.3.7 and substitute the following:*

**7.3.7** If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall make an initial determination, consistent with Section 7.3.3, of the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in Section 7.5. In such case, and also under Section 7.3.3.1.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

- .1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- .2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others; and
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work.

**3.53** *Delete Section 7.3.8 and substitute the following:*

**7.3.8** Using the percentages stated in Section 7.5, any adjustment to the Contract Sum for deleted work shall include any overhead and profit attributable to the cost for the deleted Work.

**3.54** *Add the following Sections 7.5 and 7.6:***7.5 AGREED OVERHEAD AND PROFIT RATES**

**7.5.1** For any adjustment to the Contract Sum for which overhead and profit may be recovered, other than those made pursuant to Unit Prices stated in the Contract Documents, the Contractor agrees to charge and accept, as full payment for overhead and profit, the following percentages of costs attributable to the change in the Work. The percentages cited below shall be considered to include all indirect costs including, but not limited to: field and office managers, supervisors and assistants, incidental job burdens, small tools, and general overhead allocations. The allowable percentages for overhead and profit are as follows:

- .1 To the Contractor for work performed by the Contractor's own forces, 17% of the Contractor's actual costs.
- .2 To each Subcontractor for work performed by the Subcontractor's own forces, 17% of the subcontractor's actual costs.
- .3 To the Contractor for work performed by a subcontractor, 10% of the subcontractor's actual costs (not including the subcontractor's overhead and profit).

**7.6 PRICING DATA AND AUDIT****§ 7.6.1 Cost or Pricing Data.**

Upon request of the Owner or Architect, Contractor shall submit cost or pricing data prior to execution of a Modification which exceeds \$500,000. Contractor shall certify that, to the best of its knowledge and belief, the cost or pricing data submitted is accurate, complete, and current as of a mutually determined specified date prior to the date of pricing the Modification. Contractor's price, including profit, shall be adjusted to exclude any significant sums by which such price was increased because Contractor furnished cost or pricing data that was inaccurate, incomplete, or not current as of the date specified by the parties. Notwithstanding Subparagraph 9.10.4, such adjustments may be made after final payment to the Contractor.

**§ 7.6.2** Cost or pricing data means all facts that, as of the date specified by the parties, prudent buyers and sellers would reasonably expect to affect price negotiations significantly. Cost or pricing data are factual, not judgmental; and are verifiable. While they do not indicate the accuracy of the prospective contractor's judgment about estimated future costs or projections, they do include the data forming the basis for that judgment. Cost or pricing data are more than historical accounting data; they are all the facts that can be reasonably expected to contribute to the soundness of estimates of future costs and to the validity of determinations of costs already incurred.

**§ 7.6.3 Records Retention.**

As used in Section 7.6, the term "records" means any books or records that relate to cost or pricing data that Contractor is required to submit pursuant to Section 7.6.1. Contractor shall maintain records for three years from the date of final payment, or longer if requested by the chief procurement officer. The Owner may audit Contractor's records at reasonable times and places.

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**3.55** Delete Section 8.2.2 and substitute the following:

**8.2.2** The Contractor shall not knowingly commence operations on the site or elsewhere prior to the effective date of surety bonds and insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such surety bonds or insurance.

**3.56** Delete Section 8.3.1 and substitute the following:

**8.3.1** If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the control of the Contractor and any subcontractor at any tier; or by delay authorized by the Owner pending dispute resolution; or by other causes that the Architect determines may justify delay, then to the extent such delay will prevent the Contractor from achieving Substantial Completion within the Contract Time and provided the delay (1) is not caused by the fault or negligence of the Contractor or a subcontractor at any tier and (2) is not due to unusual delay in the delivery of supplies, machinery, equipment, or services when such supplies, machinery, equipment, or services were obtainable from other sources in sufficient time for the Contractor to meet the required delivery, the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

**3.57** Insert the following at the end of Section 9.1:

All changes to the Contract Sum shall be adjusted in accordance with Section 7.3.3.

**3.58** Delete Section 9.2 and substitute the following:**9.2 SCHEDULE OF VALUES**

**9.2.1** The Contractor shall submit to the Architect, within ten days of full execution of the Agreement, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. As requested by the Architect, the Contractor and each Subcontractor shall prepare a trade payment breakdown for the Work for which each is responsible, such breakdown being submitted on a uniform standardized format approved by the Architect and Owner. The breakdown shall be divided in detail, using convenient units, sufficient to accurately determine the value of completed Work during the course of the Project. The Contractor shall update the schedule of values as required by either the Architect or Owner as necessary to reflect:

- .1** the description of Work (listing labor and material separately);
- .2** the total value;
- .3** the percent and value of the Work completed to date;
- .4** the percent and value of previous amounts billed; and
- .5** the current percent completed and amount billed.

**9.2.2** Any schedule of values or trade breakdown that fails to include sufficient detail, is unbalanced, or exhibits "front-loading" of the value of the Work shall be rejected. If a schedule of values or trade breakdown is used as the basis for payment and later determined to be inaccurate, sufficient funds shall be withheld from future Applications for Payment to ensure an adequate reserve (exclusive of normal retainage) to complete the Work.

**3.59** Delete Section 9.3.1 and substitute the following:

Monthly, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2., for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require (such as copies of requisitions from Subcontractors and material suppliers) and shall reflect retainage and any other adjustments provided in Section 5 of the Agreement. If required by the Owner or Architect, the Application for Payment shall be accompanied by a current construction schedule.

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**3.60** In Section 9.3.2, add the following words to the end of the second sentence:

provided such materials or equipment will be subsequently incorporated in the Work

*Insert the following at the end of Section 9.3.2:*

The Contractor shall 1) protect such materials from diversion, vandalism, theft, destruction, and damage, 2) mark such materials specifically for use on the Project, and 3) segregate such materials from other materials at the storage facility. The Architect and the Owner shall have the right to make inspections of the storage areas at any time.

**3.61** *In Section 9.4.2, in the first sentence, after the words “Work has progressed to the point indicated,” insert the following:*

in both the Application for Payment and, if required to be submitted by the Contractor, the accompanying current construction schedule

*In the last sentence, delete the third item starting with “(3) reviewed copies” and ending with “Contractor’s right to payment,”*

**3.62** *In Section 9.5.1, in the first sentence, delete the word “may” after the opening words “The Architect” and substitute the word “shall.”*

*In Section 9.5.1, insert the following sentence after the first sentence:*

The Architect shall withhold a Certificate of Payment if the Application for Payment is not accompanied by the current construction schedule required by Section 3.10.1.

**3.63** *In Section 9.6.2, delete the word “The...” at the beginning of the first sentence and substitute the following:*

Pursuant to Chapter 6 of Title 29 of the South Carolina Code of Laws, as amended, the

**3.64** *Delete Section 9.7 and substitute following:*

**9.7 FAILURE OF PAYMENT**

If the Architect does not issue a Certificate for Payment to the Owner, through no fault of the Contractor, within seven days after receipt of the Contractor’s Application for Payment, or if the Owner does not pay the Contractor within seven days after the time established in the Contract Documents the amount certified by the Architect or awarded by a final dispute resolution order, then the Contractor may, upon seven additional days’ written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased, in accordance with the provisions of Section 7.3.3, by the amount of the Contractor’s reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

**3.65** *Insert the following words at the end of the sentence in Section 9.8.1:*

and when all required occupancy permits, if any, have been issued and copies of same have been delivered to the Owner.

**3.66** *In Section 9.8.2, insert the word “written” after the word “comprehensive” and before the word “list.”*

**3.67** *Delete Section 9.8.3 and substitute the following:*

**9.8.3.1** Upon receipt of the Contractor’s list, the Architect, with the Owner and any other person the Architect or the Owner choose, will make an inspection on a date and at a time mutually agreeable to the Architect, Owner, and Contractor, to determine whether the Work or designated portion thereof is substantially complete. The Contractor shall furnish access for the inspection and testing as provided in this Contract. The inspection shall include a

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

demonstration by the Contractor that all equipment, systems and operable components of the Work function properly and in accordance with the Contract Documents. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion. If more than one Substantial Completion inspection is required, the Contractor shall reimburse the Owner for all costs of reinspections or, at the Owner's option, the costs may be deducted from payments due to the Contractor.

**9.8.3.2** If the Architect and Owner concur in the Contractor's assessment that the Work or a portion of the Work is safe to occupy, the Owner and Contractor may arrange for a Certificate of Occupancy Inspection by OSE. The Owner, Architect, and Contractor shall be present at OSE's inspection. Upon verifying that the Work or a portion of the Work is substantially complete and safe to occupy, OSE will issue, as appropriate, a Full or Partial Certificate of Occupancy.

**3.68** *In the second sentence of Section 9.8.5, delete the words "and consent of surety, if any."*

**3.69** *In the first sentence of Section 9.9.1, delete the words "Section 11.3.1.5" and substitute the words "Section 11.3.1.3."*

**3.70** *Delete Section 9.10.1 and substitute the following:*

**9.10.1** Unless the parties agree otherwise in the Certificate of Substantial Completion, the Contractor shall achieve Final Completion no later than thirty days after Substantial Completion. Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect, with the Owner and any other person the Architect or the Owner choose, will make an inspection on a date and at a time mutually agreeable to the Architect, Owner, and Contractor, and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. If more than one Final Completion inspection is required, the Contractor shall reimburse the Owner for all costs of reinspections or, at the Owner's option, the costs may be deducted from payments due to the Contractor. If the Contractor does not achieve final completion within thirty days after Substantial Completion or the timeframe agreed to by the parties in the Certificate of Substantial Completion, whichever is greater, the Contractor shall be responsible for any additional Architectural fees resulting from the delay.

**3.71** *Delete the first sentence of Section 9.10.2 and substitute the following:*

Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner, (6) required Training Manuals, (7) equipment Operations and Maintenance Manuals, (8) any certificates of testing, inspection or approval required by the Contract Documents and not previously provided (9) all warranties and guarantees required under or pursuant to the Contract Documents, and (10) one copy of the Documents required by Section 3.11.



**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**3.72** Delete the first sentence of Section 9.10.3 and substitute the following:

If, after Substantial Completion of the Work, final completion thereof is delayed 60 days through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted.

**3.73** Delete Section 9.10.5 and substitute the following:

**§9.10.5** Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those specific claims in stated amounts that have been previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

**3.74** Add the following Section 9.10.6:

**9.10.6** If OSE has not previously issued a Certificate of Occupancy for the entire Project, the Parties shall arrange for a representative of OSE to participate in the Final Completion Inspection. Representatives of the State Fire Marshal's Office and other authorities having jurisdiction may be present at the Final Completion Inspection or otherwise inspect the completed Work and advise the Owner whether the Work meets their respective requirements for the Project.

**3.75** Delete Section 10.3.1 and substitute the following:

**10.3.1** If the Contractor encounters a hazardous material or substance which was not discoverable as provided in Section 3.2.1 and not required by the Contract Documents, and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons or serious loss to real or personal property resulting from such material or substance encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing. Hazardous materials or substances are those hazardous, toxic, or radioactive materials or substances subject to regulations by applicable governmental authorities having jurisdiction, such as, but not limited to, the S.C. Department of Health and Environmental Control, the U.S. Environmental Protection Agency, and the U.S. Nuclear Regulatory Commission.

**3.76** Insert the following at the end of Section 10.3.2:

In the absence of agreement, the Architect will make an interim determination regarding any delay or impact on the Contractor's additional costs. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15. Any adjustment in the Contract Sum shall be determined in accordance with Section 7.3.3.

**3.77** Delete Section 10.3.3 and substitute the following:

**10.3.3** The Work in the affected area shall be resumed immediately following the occurrence of any one of the following events: (a) the Owner causes remedial work to be performed that results in the absence of hazardous materials or substances; (b) the Owner and the Contractor, by written agreement, decide to resume performance of the Work; or (c) the Work may safely and lawfully proceed, as determined by an appropriate governmental authority or as evidenced by a written report to both the Owner and the Contractor, which is prepared by an environmental engineer reasonably satisfactory to both the Owner and the Contractor.

**3.78** In Section 10.3.5, delete the word "The" at the beginning of the sentence and substitute the following:

In addition to its obligations under Section 3.18, the

**3.79** Delete the language of Section 10.3.6 and substitute the word "Reserved."

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS****3.80** *Insert the following at the end of Section 10.4:*

The Contractor shall immediately give the Architect notice of the emergency. This initial notice may be oral followed within five days by a written notice setting forth the nature and scope of the emergency. Within fourteen days of the start of the emergency, the Contractor shall give the Architect a written estimate of the cost and probable effect of delay on the progress of the Work.

**3.81** *Delete 11.1.2 and substitute the following:*

**11.1.2** The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified below or required by law, whichever coverage is greater. Coverages shall be written on an occurrence basis and shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

**(1) COMMERCIAL GENERAL LIABILITY:**

(a) General Aggregate (per project) .....	<u>\$1,000,000</u>
(b) Products/Completed Operations .....	<u>\$1,000,000</u>
(c) Personal and Advertising Injury .....	<u>\$1,000,000</u>
(d) Each Occurrence .....	<u>\$1,000,000</u>
(e) Fire Damage (Any one fire) .....	<u>\$50,000</u>
(f) Medical Expense (Any one person) .....	<u>\$5,000</u>

**(2) BUSINESS AUTO LIABILITY (including All Owned, Non-owned, and Hired Vehicles):**

(a) Combined Single Limit .....	<u>\$1,000,000</u>
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**(3) WORKER'S COMPENSATION:**

(a) State Statutory	
(b) Employers Liability .....	<u>\$100,000</u> Per Acc.
	<u>\$500,000</u> Disease, Policy Limit
	<u>\$100,000</u> Disease, Each Employee

In lieu of separate insurance policies for Commercial General Liability, Business Auto Liability, and Employers Liability, the Contractor may provide an umbrella policy meeting or exceeding all coverage requirements set forth in this Section 11.1.2. The umbrella policy limits shall not be less than \$3,000,000.

**3.82** *Delete Section 11.1.3 and substitute the following:*

**11.1.3** Prior to commencement of the Work, and thereafter upon replacement of each required policy of insurance, Contractor shall provide to the Owner a written endorsement to the Contractor's general liability insurance policy that:

- (i) names the Owner as an additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations;
- (ii) provides that no material alteration, cancellation, non-renewal, or expiration of the coverage contained in such policy shall have effect unless all additional insureds have been given at least ten (10) days prior written notice of cancellation for non-payment of premiums and thirty (30) days prior written notice of cancellation for any other reason; and
- (iii) provides that the Contractor's liability insurance policy shall be primary, with any liability insurance of the Owner as secondary and noncontributory.

Prior to commencement of the Work, and thereafter upon renewal or replacement of each required policy of insurance, Contractor shall provide to the Owner a signed, original certificate of liability insurance (ACORD 25). Consistent with this Section 11.1, the certificate shall identify the types of insurance, state the limits of liability for each type of coverage, name the Owner a Consultants as Certificate Holder, provide that the general aggregate limit applies per project, and provide that coverage is written on an occurrence basis. Both the certificates and the

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

endorsements must be received directly from either the Contractor's insurance agent or the insurance company. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, naming the Owner as an additional insured for claims made under the Contractor's completed operations, and otherwise meeting the above requirements, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

**3.83** *Delete Section 11.1.4 and substitute the following:*

**11.1.4** A failure by the Owner either (i) to demand a certificate of insurance or written endorsement required by Section 11.1, or (ii) to reject a certificate or endorsement on the grounds that it fails to comply with Section 11.1 shall not be considered a waiver of Contractor's obligations to obtain the required insurance.

**3.84** *In Section 11.3.1, delete the first sentence and substitute the following:*

Unless otherwise provided in the Contract Documents, the Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis.

**3.85** *Delete the language of Section 11.3.1.2 and substitute the word "Reserved."***3.86** *Delete the language of Section 11.3.1.3 and substitute the word "Reserved."***3.87** *Delete Section 11.3.2 and substitute the following:***11.3.2 BOILER AND MACHINERY INSURANCE**

The Contractor shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall both be named insureds.

**3.88** *Delete Section 11.3.3 and substitute the following:***11.3.3 LOSS OF USE INSURANCE**

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. To the extent any losses are covered and paid for by such insurance, the Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

**3.89** *Delete Section 11.3.4 and substitute the following:*

**11.3.4** If the Owner requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Contractor shall, if possible, include such insurance, and the cost thereof shall be charged to the Owner by appropriate Change Order.

**3.90** *Delete the language of Section 11.3.5 and substitute the word "Reserved."***3.91** *Delete Section 11.3.6 and substitute the following:*

**11.3.6** Before an exposure to loss may occur, the Contractor shall file with the Owner a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Owner.

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**3.92** Delete the first sentence of Section 11.3.7 and substitute the following:

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent the property insurance provided by the Contractor pursuant to this Section 11.3 covers and pays for the damage, except such rights as they have to proceeds of such insurance held by the Contractor as fiduciary.

**3.93** Delete the first sentence of Section 11.3.8 and substitute the following:

A loss insured under the Contractor's property insurance shall be adjusted by the Contractor as fiduciary and made payable to the Contractor as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10.

**3.94** Delete Section 11.3.9 and substitute the following:

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

**3.95** Delete Section 11.3.10 and substitute the following:

**11.3.10** The Contractor as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Contractor's exercise of this power; if such objection is made, the dispute shall be resolved in the manner provided in the contract between the parties in dispute as the method of binding dispute resolution. The Contractor as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with a final order or determination issued by the appropriate authority having jurisdiction over the dispute..

**3.96** Delete Section 11.4.1 and substitute the following:

**11.4.1** Before commencing any services hereunder, the Contractor shall provide the Owner with Performance and Payment Bonds, each in an amount not less than the Contract Price set forth in Article 4 of the Agreement. The Surety shall have, at a minimum, a "Best Rating" of "A" as stated in the most current publication of "Best's Key Rating Guide, Property-Casualty". In addition, the Surety shall have a minimum "Best Financial Strength Category" of "Class V", and in no case less than five (5) times the contract amount. The Performance Bond shall be written on Form SE-355, "Performance Bond" and the Payment Bond shall be written on Form SE-357, "Labor and Material Payment Bond", and both shall be made payable to the Owner.

**3.97** Delete Section 11.4.2 and substitute the following:

**11.4.2** The Performance and Labor and Material Payment Bonds shall:

- .1** be issued by a surety company licensed to do business in South Carolina;
- .2** be accompanied by a current power of attorney and certified by the attorney-in-fact who executes the bond on the behalf of the surety company; and
- .3** remain in effect for a period not less than one (1) year following the date of Substantial Completion or the time required to resolve any items of incomplete Work and the payment of any disputed amounts, whichever time period is longer.

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**3.98** *Add the following Sections 11.4.3 and 11.4.4:*

**11.4.3** Any bonds required by this Contract shall meet the requirements of the South Carolina Code of Laws and Regulations, as amended.

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

**3.99** *Delete Section 12.1.1 and substitute the following:*

**12.1.1** If a portion of the Work is covered contrary to the requirements specifically expressed in the Contract Documents, including inspections of work-in-progress required by all authorities having jurisdiction over the Project, it must, upon demand of the Architect or authority having jurisdiction, be uncovered for observation and be replaced at the Contractor's expense without change in the Contract Time.

**3.100** *In Section 12.2.2.1, delete the words "and to make a claim for breach of warranty" at the end of the third sentence.***3.101** *In Section 12.2.2.3, add the following to the end of the sentence:*

unless otherwise provided in the Contract Documents.

**3.102** *Insert the following at the end of Section 12.2.4:*

If, prior to the date of Substantial Completion, the Contractor, a Subcontractor, or anyone for whom either is responsible, uses or damages any portion of the Work, including, without limitation, mechanical, electrical, plumbing, and other building systems, machinery, equipment, or other mechanical device, the Contractor shall cause such item to be restored to "like new" condition at no expense to the Owner.

**3.103** *Delete Section 13.1 and substitute the following:***13.1 GOVERNING LAW**

The Contract, any dispute, claim, or controversy relating to the Contract, and all the rights and obligations of the parties shall, in all respects, be interpreted, construed, enforced and governed by and under the laws of the State of South Carolina, except its choice of law rules.

**3.104** *Delete Section 13.2, including its Sub-Sections 13.2.1 and 13.2.2, and substitute the following:***13.2 SUCCESSORS AND ASSIGNS**

The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole, or in part, without written consent of the other and then only in accordance with and as permitted by Regulation 19-445.2180 of the South Carolina Code of Regulations, as amended. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

**3.105** *Delete Section 13.3 and substitute the following:***13.3 WRITTEN NOTICE**

Unless otherwise permitted herein, all notices contemplated by the Contract Documents shall be in writing and shall be deemed given:

- .1** upon actual delivery, if delivery is by hand;
- .2** upon receipt by the transmitting party of confirmation or reply, if delivery is by electronic mail, facsimile, telex or telegram;
- .3** upon receipt, if delivery is by the United States mail.

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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Notice to Contractor shall be to the address provided in Section 8.3.2 of the Agreement. Notice to Owner shall be to the address provided in Section 8.2.2 of the Agreement. Either party may designate a different address for notice by giving notice in accordance with this paragraph.

**3.106** *In Section 13.4.1, insert the following at the beginning of the sentence:*

Unless expressly provided otherwise,

**3.107** *Add the following Section 13.4.3:*

**13.4.3** Notwithstanding Section 9.10.4, the rights and obligations which, by their nature, would continue beyond the termination, cancellation, rejection, or expiration of this contract shall survive such termination, cancellation, rejection, or expiration, including, but not limited to, the rights and obligations created by the following clauses:

**1.5** Ownership and Use of Drawings, Specifications and Other Instruments of Service;

**3.5** Warranty

**3.17** Royalties, Patents and Copyrights

**3.18** Indemnification

**7.6** Cost or Pricing Data

**11.1** Contractor's Liability Insurance

**11.4** Performance and Payment Bond

**15.1.6** Claims for Listed Damages

**15.1.7** Waiver of Claims Against the Architect

**15.6** Dispute Resolution

**15.4** Service of Process

**3.108** *Delete Section 13.6 and substitute the following:*

**13.6 INTEREST**

Payments due to the Contractor and unpaid under the Contract Documents shall bear interest only if and to the extent allowed by Title 29, Chapter 6, Article 1 of the South Carolina Code of Laws. Amounts due to the Owner shall bear interest at the rate of one percent a month or a pro rata fraction thereof on the unpaid balance as may be due.

**3.109** *Delete the language of Section 13.7 and substitute the word "Reserved."*

**3.110** *Add the following Sections 13.8 through 13.16:*

**13.8 PROCUREMENT OF MATERIALS BY OWNER**

The Contractor accepts assignment of all purchase orders and other agreements for procurement of materials and equipment by the Owner that are identified as part of the Contract Documents. The Contractor shall, upon delivery, be responsible for the storage, protection, proper installation, and preservation of such Owner purchased items, if any, as if the Contractor were the original purchaser. The Contract Sum includes, without limitation, all costs and expenses in connection with delivery, storage, insurance, installation, and testing of items covered in any assigned purchase orders or agreements. Unless the Contract Documents specifically provide otherwise, all Contractor warranty of workmanship and correction of the Work obligations under the Contract Documents shall apply to the Contractor's installation of and modifications to any Owner purchased items,.

**13.9 INTERPRETATION OF BUILDING CODES**

As required by Title 10, Chapter 1, Section 180 of the South Carolina Code of Laws, as amended, OSE shall determine the enforcement and interpretation of all building codes and referenced standards on state buildings. The Contractor shall refer any questions, comments, or directives from local officials to the Owner and OSE for resolution.

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**13.10 MINORITY BUSINESS ENTERPRISES**

Contractor shall notify Owner of each Minority Business Enterprise (MBE) providing labor, materials, equipment, or supplies to the Project under a contract with the Contractor. Contractor's notification shall be via the first monthly status report submitted to the Owner after execution of the contract with the MBE. For each such MBE, the Contractor shall provide the MBE's name, address, and telephone number, the nature of the work to be performed or materials or equipment to be supplied by the MBE, whether the MBE is certified by the South Carolina Office of Small and Minority Business Assistance, and the value of the contract.

**13.11 SEVERABILITY**

If any provision or any part of a provision of the Contract Documents shall be finally determined to be superseded, invalid, illegal, or otherwise unenforceable pursuant to any applicable Legal Requirements, such determination shall not impair or otherwise affect the validity, legality, or enforceability of the remaining provision or parts of the provision of the Contract Documents, which shall remain in full force and effect as if the unenforceable provision or part were deleted.

**13.12 ILLEGAL IMMIGRATION**

Contractor certifies and agrees that it will comply with the applicable requirements of Title 8, Chapter 14 of the South Carolina Code of Laws and agrees to provide to the State upon request any documentation required to establish either: (a) that Title 8, Chapter 14 is inapplicable both to Contractor and its subcontractors or sub-subcontractors; or (b) that Contractor and its subcontractors or sub-subcontractors are in compliance with Title 8, Chapter 14. Pursuant to Section 8-14-60, "A person who knowingly makes or files any false, fictitious, or fraudulent document, statement, or report pursuant to this chapter is guilty of a felony, and, upon conviction, must be fined within the discretion of the court or imprisoned for not more than five years, or both." Contractor agrees to include in any contracts with its subcontractors language requiring its subcontractors to (a) comply with the applicable requirements of Title 8, Chapter 14, and (b) include in their contracts with the sub-subcontractors language requiring the sub-subcontractors to comply with the applicable requirements of Title 8, Chapter 14. (An overview is available at [www.procurement.sc.gov](http://www.procurement.sc.gov))

**13.13 SETOFF**

The Owner shall have all of its common law, equitable, and statutory rights of set-off.

**13.14 DRUG-FREE WORKPLACE**

The Contractor certifies to the Owner that Contractor will provide a Drug-Free Workplace, as required by Title 44, Chapter 107 of the South Carolina Code of Laws, as amended.

**13.15 FALSE CLAIMS**

According to the S.C. Code of Laws § 16-13-240, "a person who by false pretense or representation obtains the signature of a person to a written instrument or obtains from another person any chattel, money, valuable security, or other property, real or personal, with intent to cheat and defraud a person of that property is guilty" of a crime.

**13.16 NON-INDEMNIFICATION:**

Any term or condition is void to the extent it requires the State to indemnify anyone. It is unlawful for a person charged with disbursements of state funds appropriated by the General Assembly to exceed the amounts and purposes stated in the appropriations. (§ 11-9-20) It is unlawful for an authorized public officer to enter into a contract for a purpose in which the sum is in excess of the amount appropriated for that purpose. It is unlawful for an authorized public officer to divert or appropriate the funds arising from any tax levied and collected for any one fiscal year to the payment of an indebtedness contracted or incurred for a previous year. (§ 11-1-40)

**3.111** *Delete Section 14.1.1 and substitute the following:*

**14.1.1** The Contractor may terminate the Contract if the Work is stopped for a period of 45 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1** Issuance of an order of a court or other public authority having jurisdiction that requires substantially all Work to be stopped; or

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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- .2** An act of government, such as a declaration of national emergency that requires substantially all Work to be stopped.
- .3** Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents and the Contractor has stopped work in accordance with Section 9.7

**3.112** *Insert the following at the end of Section 14.1.3:*

Any adjustment to the Contract Sum pursuant to this Section shall be made in accordance with the requirements of Article 7.

**3.113** *In Section 14.1.4, replace the word “repeatedly” with the word “persistently.”***3.114** *Delete Section 14.2.1 and substitute the following:*

**14.2.1** The Owner may terminate the Contract if the Contractor

- .1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials, or otherwise fails to prosecute the Work, or any separable part of the Work, with the diligence, resources and skill that will ensure its completion within the time specified in the Contract Documents, including any authorized adjustments;
- .2** fails to make payment to Subcontractors for materials or labor in accordance with the Contract Documents and the respective agreements between the Contractor and the Subcontractors;
- .3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4** otherwise is guilty of substantial breach of a provision of the Contract Documents.

**3.115** *In Section 14.2.2, delete the parenthetical statement “, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action,” immediately following the word “Owner” in the first line.***3.116** *In Section 14.2.4, replace the words “Initial Decision Maker” with the word “Architect”***3.117** *Add the following Section 14.2.5:*

**14.2.5** If, after termination for cause, it is determined that the Owner lacked justification to terminate under Section 14.2.1, or that the Contractor’s default was excusable, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the Owner under Section 14.4.

**3.118** *Delete the second sentence of Section 14.3.2 and substitute the following:*

Any adjustment to the Contract Sum made pursuant to this section shall be made in accordance with the requirements of Article 7.3.3.

**3.119** *Delete Section 14.4.1 and substitute the following:*

**14.4.1** The Owner may, at any time, terminate the Contract, in whole or in part for the Owner’s convenience and without cause. The Owner shall give written notice of the termination to the Contractor specifying the part of the Contract terminated and when termination becomes effective.

**3.120** *Delete Section 14.4.2 and substitute the following:*

**14.4.2** Upon receipt of written notice from the Owner of such termination for the Owner’s convenience, the Contractor shall

- .1** cease operations as directed by the Owner in the notice;
- .2** take actions necessary, or that the Owner may direct, for the protection and preservation of the Work;



**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders; and
- .4 complete the performance of the Work not terminated, if any.

**3.121** *Delete Section 14.4.3 and substitute the following:*

**14.4.3** In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, costs incurred by reason of such termination, and any other adjustments otherwise allowed by the Contract. Any adjustment to the Contract Sum made pursuant to this Section 14.4 shall be made in accordance with the requirements of Article 7.3.3.

**3.122** *Add the following Sections 14.4.4, 14.4.5, and 14.5:*

**14.4.4** Contractor's failure to include an appropriate termination for convenience clause in any subcontract shall not (i) affect the Owner's right to require the termination of a subcontract, or (ii) increase the obligation of the Owner beyond what it would have been if the subcontract had contained an appropriate clause.

**14.4.5** Upon written consent of the Contractor, the Owner may reinstate the terminated portion of this Contract in whole or in part by amending the notice of termination if it has been determined that:

- .1 the termination was due to withdrawal of funding by the General Assembly, Governor, or Budget and Control Board or the need to divert project funds to respond to an emergency as defined by Regulation 19-445.2110(B) of the South Carolina Code of Regulations, as amended;
- .2 funding for the reinstated portion of the work has been restored;
- .3 circumstances clearly indicate a requirement for the terminated work; and
- .4 reinstatement of the terminated work is advantageous to the Owner.

**14.5 CANCELLATION AFTER AWARD BUT PRIOR TO PERFORMANCE**

Pursuant to Title 11, Chapter 35 and Regulation 19-445.2085 of the South Carolina Code of Laws and Regulations, as amended, this contract may be canceled after award but prior to performance.

**3.123** *Insert the following sentence after the second sentence of Section 15.1.1:*

A voucher, invoice, payment application or other routine request for payment that is not in dispute when submitted is not a Claim under this definition.

**3.124** *Delete Section 15.1.2 and substitute the following:***15.1.2 NOTICE OF CLAIMS**

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Architect. Such notice shall include sufficient information to advise the Architect and other party of the circumstances giving rise to the claim, the specific contractual adjustment or relief requested and the basis of such request. Claims by either party arising prior to the date final payment is due must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later except as stated for adverse weather days in Section 15.1.5.2. By failing to give written notice of a Claim within the time required by this Section, a party expressly waives its claim.

**3.125** *Delete Section 15.1.3 and substitute the following:***15.1.3 CONTINUING CONTRACT PERFORMANCE**

Pending final resolution of a Claim, including any administrative review allowed under Section 15.6, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will issue Certificates for Payment in accordance with the initial decisions and determinations of the Architect.

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**3.126** *Insert the following at the end of Section 15.1.5.1:*

Claims for an increase in the Contract Time shall be based on one additional calendar day for each full calendar day that the Contractor is prevented from working.

**3.127** *Insert the following Sub-Sections at the end of Section 15.1.5.2:*

- .1** Claims for adverse weather shall be based on actual weather conditions at the job site or other place of performance of the Work, as documented in the Contractor's job site log.
- .2** For the purpose of this Contract, a total of five (5) calendar days per calendar month (non-cumulative) shall be anticipated as "adverse weather" at the job site, and such time will not be considered justification for an extension of time. If, in any month, adverse weather develops beyond the five (5) days, the Contractor shall be allowed to claim additional days to compensate for the excess weather delays only to the extent of the impact on the approved construction schedule. The remedy for this condition is for an extension of time only and is exclusive of all other rights and remedies available under the Contract Documents or imposed or available by law.
- .3** The Contractor shall submit monthly with their pay application all claims for adverse weather conditions that occurred during the previous month. The Architect shall review each monthly submittal in accordance with Section 15.5 and inform the Contractor and the Owner promptly of its evaluation. Approved days shall be included in the next Change Order issued by the Architect. Adverse weather conditions not claimed within the time limits of this Subparagraph shall be considered to be waived by the Contractor. Claims will not be allowed for adverse weather days that occur after the scheduled (original or adjusted) date of Substantial Completion.

**3.128** *Delete Section 15.1.6 and substitute the following:***15.1.6 CLAIMS FOR LISTED DAMAGES**

Notwithstanding any other provision of the Contract Documents, including Section 1.2.1, but subject to a duty of good faith and fair dealing, the Contractor and Owner waive Claims against each other for listed damages arising out of or relating to this Contract.

**15.1.6.1** For the Owner, listed damages are (i) lost revenue and profit, (ii) losses resulting from injury to business or reputation, (iii) additional or escalated overhead and administration expenses, (iv) additional financing costs, (v) costs suffered by a third party unable to commence work, (vi) attorney's fees, (vii) any interest, except to the extent allowed by Section 13.6 (Interest), (viii) lost revenue and profit for lost use of the property, (ix) costs resulting from lost productivity or efficiency.

**15.1.6.2** For the Contractor, listed damages are (i) lost revenue and profit, (ii) losses resulting from injury to business or reputation, (iii) additional or escalated overhead and administration expenses, (iv) additional financing costs, (v) attorney's fees, (vi) any interest, except to the extent allowed by Section 13.6 (Interest); (vii) unamortized equipment costs; and, (viii) losses incurred by subcontractors for the types of damages the Contractor has waived as against the Owner. Without limitation, this mutual waiver is applicable to all damages due to either party's termination in accordance with Article 14. Nothing contained in this Section shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents. This mutual waiver is not applicable to amounts due or obligations under Section 3.18 (Indemnification).

**3.129** *Add the following Section 15.1.7:***15.1.7 WAIVER OF CLAIMS AGAINST THE ARCHITECT**

Notwithstanding any other provision of the Contract Documents, including Section 1.2.1, but subject to a duty of good faith and fair dealing, the Contractor waives all claims against the Architect and any other design professionals who provide design and/or project management services to the Owner, either directly or as independent contractors or subcontractors to the Architect, for listed damages arising out of or relating to this Contract. The listed damages are (i) lost revenue and profit, (ii) losses resulting from injury to business or reputation, (iii) additional or escalated overhead and administration expenses, (iv) additional financing costs, (v)

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

attorney's fees, (vi) any interest; (vii) unamortized equipment costs; and, (viii) losses incurred by subcontractors for the types of damages the Contractor has waived as against the Owner. This mutual waiver is not applicable to amounts due or obligations under Section 3.18 (Indemnification).

**3.130** *Delete the language of Sections 15.2, 15.3, and 15.4, including all Sub-Sections, and substitute the word "Reserved" for the deleted language of each Section and Sub-Section.*

**3.131** *Add the following Sections 15.5 and 15.6 with their sub-sections:*

**15.5 CLAIM AND DISPUTES - DUTY OF COOPERATION, NOTICE, AND ARCHITECTS****INITIAL DECISION**

**15.5.1** Contractor and Owner are fully committed to working with each other throughout the Project to avoid or minimize claims. To further this goal, Contractor and Owner agree to communicate regularly with each other and the Architect at all times notifying one another as soon as reasonably possible of any issue that if not addressed may cause loss, delay, and/or disruption of the Work. If claims do arise, Contractor and Owner each commit to resolving such claims in an amicable, professional, and expeditious manner to avoid unnecessary losses, delays, and disruptions to the Work.

**15.5.2** Claims shall first be referred to the Architect for initial decision. An initial decision shall be required as a condition precedent to resolution pursuant to Section 15.6 of any Claim arising prior to the date of final payment, unless 30 days have passed after the Claim has been referred to the Architect with no decision having been rendered, or after all the Architect's requests for additional supporting data have been answered, whichever is later. The Architect will not address claims between the Contractor and persons or entities other than the Owner.

**15.5.3** The Architect will review Claims and within ten days of the receipt of a Claim (1) request additional supporting data from the claimant or a response with supporting data from the other party or (2) render an initial decision in accordance with Section 15.5.5.

**15.5.4** If the Architect requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Architect when the response or supporting data will be furnished or (3) advise the Architect that all supporting data has already been provided. Upon receipt of the response or supporting data, the Architect will render an initial decision in accordance with Section 15.5.5.

**15.5.5** The Architect will render an initial decision in writing; (1) stating the reasons therefor; and (2) notifying the parties of any change in the Contract Sum or Contract Time or both. The Architect will deliver the initial decision to the parties within two weeks of receipt of any response or supporting data requested pursuant to Section 16.4, or within such longer period as may be mutually agreeable to the parties. If the parties accept the initial decision, the Architect shall prepare a Change Order with appropriate supporting documentation for the review and approval of the parties and the Office of State Engineer. If either the Contractor, Owner, or both, disagree with the initial decision, the Contractor and Owner shall proceed with dispute resolution in accordance with the provisions of Section 15.6.

**15.5.6** In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

**15.6 DISPUTE RESOLUTION**

**15.6.1** If a claim is not resolved pursuant to Section 15.5 to the satisfaction of either party, both parties shall attempt to resolve the dispute at the field level through discussions between Contractor's Representative and Owner's Representative. If a dispute cannot be resolved through Contractor's Representative and Owner's Representative, then the Contractor's Senior Representative and the Owner's Senior Representative, upon the request of either party, shall meet as soon as conveniently possible, but in no case later than twenty-one days after such a request is made, to attempt to resolve such dispute. Prior to any meetings between the Senior Representatives, the parties will exchange relevant information that will assist the parties in resolving their dispute. The meetings required by this Section are a condition precedent to resolution pursuant to Section 15.6.2.

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

**15.6.2** If after meeting in accordance with the provisions of Section 15.6.1, the Senior Representatives determine that the dispute cannot be resolved on terms satisfactory to both the Contractor and the Owner, then either party may submit the dispute by written request to South Carolina's Chief Procurement Officer for Construction (CPOC). Except as otherwise provided in Article 15, all claims, claims, or controversies relating to the Contract shall be resolved exclusively by the appropriate Chief Procurement Officer in accordance with Title 11, Chapter 35, Article 17 of the South Carolina Code of Laws, or in the absence of jurisdiction, only in the Court of Common Pleas for, or in the absence of jurisdiction a federal court located in, Richland County, State of South Carolina. Contractor agrees that any act by the State regarding the Contract is not a waiver of either the State's sovereign immunity or the State's immunity under the Eleventh Amendment of the United State's Constitution.

**15.6.3** If any party seeks resolution to a dispute pursuant to Section 15.6.2, the parties shall participate in non-binding mediation to resolve the claim. If the claim is governed by Title 11, Chapter 35, Article 17 of the South Carolina Code of Laws as amended and the amount in controversy is \$100,000.00 or less, the CPOC shall appoint a mediator, otherwise, the mediation shall be conducted by an impartial mediator selected by mutual agreement of the parties, or if the parties cannot so agree, a mediator designated by the American Arbitration Association ("AAA") pursuant to its Construction Industry Mediation Rules. The mediation will be governed by and conducted pursuant to a mediation agreement negotiated by the parties or, if the parties cannot so agree, by procedures established by the mediator.

**15.6.4** Without relieving any party from the other requirements of Sections 15.5 and 15.6, either party may initiate proceedings in the appropriate forum prior to initiating or completing the procedures required by Sections 15.5 and 15.6 if such action is necessary to preserve a claim by avoiding the application of any applicable statutory period of limitation or repose.

**15.6.5 SERVICE OF PROCESS**

Contractor consents that any papers, notices, or process necessary or proper for the initiation or continuation of any claims, claims, or controversies relating to the Contract; for any court action in connection therewith; or for the entry of judgment on any award made, may be served on Contractor by certified mail (return receipt requested) addressed to Contractor at the address provided for the Contractor's Senior Representative or by personal service or by any other manner that is permitted by law, in or outside South Carolina. Notice by certified mail is deemed duly given upon deposit in the United States mail.

**3.132 Add the following Article 16:****ARTICLE 16 PROJECT-SPECIFIC REQUIREMENTS AND INFORMATION****16.1. Inspection Requirements:** *(Indicate the inspection services required by the Contract)*

- ☐ Special Inspections are required and are not part of the Contract Sum. *(see section 01400)*
- ☐ Building Inspections are required and are not part of the Contract Sum. *(see section 01400)*
- ☐ Building Inspections are required and are part of the Contract Sum.

The inspections required for this Work are :

*(Indicate which services are required and the provider)*

- ☐ Civil: \_\_\_\_\_
- ☐ Structural: \_\_\_\_\_
- ☐ Mechanical: \_\_\_\_\_
- ☐ Plumbing: \_\_\_\_\_
- ☐ Electrical: \_\_\_\_\_
- ☐ Gas: \_\_\_\_\_
- ☐ Other (list): \_\_\_\_\_

Remarks: \_\_\_\_\_

**OSE FORM 00811****STANDARD SUPPLEMENTARY CONDITIONS**

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**16.1.1** Contractor shall schedule and request inspections in an orderly and efficient manner and shall notify the Owner whenever the Contractor schedules an inspection in accordance with the requirements of Section 16.1. Contractor shall be responsible for the cost of inspections scheduled and conducted without the Owner's knowledge and for any increase in the cost of inspections resulting from the inefficient scheduling of inspections.

**16.2** List Cash Allowances, if any. *(Refer to attachments as needed. If none, enter NONE)*

None

**16.3.** Requirements for Record Drawings, if any. *(Refer to attachments as needed. If none, enter NONE)*

None

**16.4.** Requirements for Shop Drawings and other submittals, if any, including number, procedure for submission, list of materials to be submitted, etc. *(Refer to attachments as needed. If none, enter NONE)*

None

**16.5.** Requirements for signage, on-site office or trailer, utilities, restrooms, etc., in addition to the Contract, if any. *(Refer to attachments as needed. If none, enter NONE)*

None

**16.6.** Requirements for Project Cleanup in addition to the Contract, if any. *(Refer to attachments as needed. If none, enter NONE)*

None

**16.7.** List all attachments that modify these General Conditions. *(If none, enter NONE)*

None



USC SUPPLEMENTAL GENERAL CONDITIONS  
FOR CONSTRUCTION PROJECTS

1. Contractor's employees shall take all reasonable means not to interrupt the flow of student traffic in building corridors, lobbies and stairs. All necessary and reasonable safety precautions shall be taken to prevent injury to building occupants while transporting materials and equipment through the building to the work area. Providing safe, accessible, plywood pedestrian ways around construction may be required if a suitable alternative route is not found.
2. Fraternalization between Contractor's employees and USC students, faculty or staff is strictly prohibited-zero tolerance!
3. 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.
4. Contractor's employees must adhere to the University's policy of maintaining a drug-free and smoke-free/tobacco-free workplace.
5. 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.
6. A welding permit must be issued by the University Fire Marshall before any welding can begin inside a building. Project Manager will coordinate.
7. Contractor must notify the University immediately upon the discovery of suspect materials such as those potentially containing asbestos or other such hazardous materials. These materials must not be disturbed until approved by the USC Project Manager.
8. 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. No personal vehicles will be allowed in this area, or in any areas surrounding the construction site that are not regular or authorized parking lots. Personal vehicles must be parked in the perimeter parking lots. Parking permits can be obtained at the USC Parking Office located in the Pendleton Street parking garage. The lay down area will be clearly identified to the contractor by the PM, with a sketch or drawing provided to Parking. In turn, the contractor will mark off this area with a sign containing the project name, PM name and contact number, and end date. Where this area is subject to foot traffic, protective barriers will be provided as specified by the PM. The area will be maintained in a neat and orderly fashion. Vehicles parked in the lay down area (or designated parking areas) will be clearly marked or display a CPC furnished placard for identification.
9. Contractor will be responsible for providing its own temporary toilet facilities, unless prior arrangements are made with the USC Project Manager.
10. Use of USC communications facilities (telephones, computers, etc.) by the Contractor is prohibited, unless prior arrangements are made with the USC Project Manager.

11. For all projects over \$100,000, including IDC's, an SE-395, Contractor Performance Evaluation, will be completed by the USC Project Manager and 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 and a Construction Performance rating will be established.
12. Contractor is responsible for removal of all debris from the site, and is required to provide the necessary dumpsters which will be emptied at least two (2) times per week. 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 JOBSITES REGULARLY AND WILL FINE ANY CONTRACTOR FOUND TO BE IN VIOLATION OF THIS REQUIREMENT AN AMOUNT OF UP TO \$1,000 PER VIOLATION.
13. 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.
14. Tree protection fencing is required to protect existing trees and other landscape features to be preserved within a construction area. The limits of this fence will be evaluated for each situation with the consultant, USC Arborist and USC Project Manager. The tree protection fence shall be 5' high chain link fence unless otherwise approved by USC Project Manager. No entry 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.
15. Where it is necessary to cross walks, tree root zones (i.e. under canopy) or lawns the following measures shall be taken: For single loads up to 9,000 lbs., a 3/4" minimum plywood base shall be placed over areas impacted. For single loads over 9,000 lbs., two layers of 3/4" plywood is required.
16. For projects requiring heavy loads to cross walks tree root ones or lawns. 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.
17. Any damage to existing landscaping (including lawn areas) will be remediated before final payment is made.

(USC Arborist, Kevin Curtis, may be contacted at 777-0033, cell 315-0319)



**SE-355**  
**Performance Bond**

**2011 Edition**  
**Rev.10-29-12**

**KNOW ALL MEN BY THESE PRESENTS**, that *(Insert full name or legal title and address of Contractor)*

Name: \_\_\_\_\_

Address: \_\_\_\_\_

hereinafter referred to as "Contractor", and *(Insert full name and address of principal place of business of Surety)*

Name: \_\_\_\_\_

Address: \_\_\_\_\_

hereinafter called the "surety", are jointly and severally held and firmly bound unto *(Insert full name and address of Agency)*

Name: University of South Carolina

Address: 743 Greene Street  
Columbia, SC 29208

hereinafter referred to as "Agency", or its successors or assigns, the sum of \_\_\_\_\_ (\$ \_\_\_\_\_), being the sum of the Bond to which payment to be well and truly made, the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

**WHEREAS**, Contractor has by written agreement dated \_\_\_\_\_ entered into a contract with Agency to construct

State Project Name: 1600 Hampton Annex

State Project Number: H27-6107

Brief Description of Awarded Work, as found on the SE-330, Bid Form: Demolition and installation of new systems including architectural, plumbing, mechanical, electrical, and fire alarm. Asbestos abatement by Owner. Small and minority business participation is encouraged.

in accordance with Drawings and Specifications prepared by *(Insert full name and address of A/E)*

Name: Jumper Carter Sease/Architects, P.A.

Address: 412 Meeting Street  
West Columbia, SC 29169

which agreement is by reference made a part hereof, and is hereinafter referred to as the Contract.

**IN WITNESS WHEREOF**, Surety and Contractor, intending to be legally bound hereby, subject to the terms stated herein, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

DATED this \_\_\_\_\_ day of \_\_\_\_\_, 2\_\_\_\_\_, BOND NUMBER \_\_\_\_\_  
*(shall be no earlier than Date of Contract)*

CONTRACTOR

SURETY

By: \_\_\_\_\_  
(Seal)

By: \_\_\_\_\_  
(Seal)

Print Name: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Title: \_\_\_\_\_

Print Title: \_\_\_\_\_  
(Attach Power of Attorney)

Witness: \_\_\_\_\_

Witness: \_\_\_\_\_

*(Additional Signatures, if any, appear on attached page)*

**Performance Bond****Performance Bond****NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT:**

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Agency for the full and faithful performance of the contract, which is incorporated herein by reference

2. If the Contractor performs the contract, the Surety and the Contractor have no obligation under this Bond, except to participate in conferences as provided in paragraph 3.1.

3. The Surety's obligation under this Bond shall arise after:

3.1 The Agency has notified the Contractor and the Surety at the address described in paragraph 10 below, that the Agency is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If the Agency, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive the Agency's right, if any, subsequently to declare a Contractor Default; or

3.2 The Agency has declared a Contractor Default and formally terminated the Contractor's right to complete the Contract.

4. The Surety shall, within 15 days after receipt of notice of the Agency's declaration of a Contractor Default, and at the Surety's sole expense, take one of the following actions:

4.1 Arrange for the Contractor, with consent of the Agency, to perform and complete the Contract; or

4.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or

4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Agency for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the Agency and the contractor selected with the Agency's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract, and pay to the Agency the amount of damages as described in paragraph 7 in excess of the Balance of the Contract Sum incurred by the Agency resulting from the Contractor Default; or

4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and:

4.4.1 After investigation, determine the amount for which it may be liable to the Agency and, within 60 days of waiving its rights under this paragraph, tender payment thereof to the Agency; or

4.4.2 Deny liability in whole or in part and notify the Agency, citing the reasons therefore.

5. Provided Surety has proceeded under paragraphs 4.1, 4.2, or 4.3, the Agency shall pay the Balance of the Contract Sum to either:

5.1 Surety in accordance with the terms of the Contract; or

5.2 Another contractor selected pursuant to paragraph 4.3 to perform the Contract.

5.3 The balance of the Contract Sum due either the Surety or another contractor shall be reduced by the amount of damages as described in paragraph 7.

6. If the Surety does not proceed as provided in paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond 15 days after receipt of written notice from the Agency to the Surety demanding that the Surety perform its obligations under this Bond, and the Agency shall be entitled to enforce any remedy available to the Agency.

6.1 If the Surety proceeds as provided in paragraph 4.4, and the Agency refuses the payment tendered or the Surety has denied liability, in whole or in part, then without further notice the Agency shall be entitled to enforce any remedy available to the Agency.

6.2 Any dispute, suit, action or proceeding arising out of or relating to this Bond shall be governed by the Dispute Resolution process defined in the Contract Documents and the laws of the State of South Carolina.

7. After the Agency has terminated the Contractor's right to complete the Contract, and if the Surety elects to act under paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Agency shall be those of the Contractor under the Contract, and the responsibilities of the Agency to the Surety shall those of the Agency under the Contract. To a limit of the amount of this Bond, but subject to commitment by the Agency of the Balance of the Contract Sum to mitigation of costs and damages on the Contract, the Surety is obligated to the Agency without duplication for:

7.1 The responsibilities of the Contractor for correction of defective Work and completion of the Contract; and

7.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under paragraph 4; and

7.3 Damages awarded pursuant to the Dispute Resolution Provisions of the Contract. Surety may join in any Dispute Resolution proceeding brought under the Contract and shall be bound by the results thereof; and

7.4 Liquidated Damages, or if no Liquidated Damages are specified in the Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. The Surety shall not be liable to the Agency or others for obligations of the Contractor that are unrelated to the Contract, and the Balance of the Contract Sum shall not be reduced or set-off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Agency or its heirs, executors, administrators, or successors.

9. The Surety hereby waives notice of any change, including changes of time, to the contract or to related subcontracts, purchase orders and other obligations.

10. Notice to the Surety, the Agency or the Contractor shall be mailed or delivered to the address shown on the signature page.

11. Definitions

11.1 Balance of the Contract Sum: The total amount payable by the Agency to the Contractor under the Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts to be received by the Agency in settlement of insurance or other Claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Contract.

11.2 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform the Contract or otherwise to comply with the terms of the Contract.

# SE-357

## Labor and Material Payment Bond

**KNOW ALL MEN BY THESE PRESENTS**, that *(Insert full name or legal title and address of Contractor)*

Name: \_\_\_\_\_

Address: \_\_\_\_\_

hereinafter referred to as "Contractor", and *(Insert full name and address of principal place of business of Surety)*

Name: \_\_\_\_\_

Address: \_\_\_\_\_

hereinafter called the "surety", are jointly and severally held and firmly bound unto *(Insert full name and address of Agency)*

Name: University of South Carolina

Address: 743 Greene Street  
Columbia, SC 29208

hereinafter referred to as "Agency", or its successors or assigns, the sum of \_\_\_\_\_ (\$ \_\_\_\_\_), being the sum of the Bond to which payment to be well and truly made, the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

**WHEREAS**, Contractor has by written agreement dated \_\_\_\_\_ entered into a contract with Agency to construct

Project Name: 1600 Hampton Annex

Project Number: H27-6107

Brief Description of Awarded Work, as found on the SE-330, Bid Form: Demolition and installation of new systems including architectural, plumbing, mechanical, electrical, and fire alarm. Asbestos abatement by Owner. Small and minority business participation is encouraged.

in accordance with Drawings and Specifications prepared by *(Insert full name and address of A/E)*

Name: Jumper Carter Sease /Architects, P.A.

Address: 412 Meeting Street  
West Columbia, SC 29169

which agreement is by reference made a part hereof, and is hereinafter referred to as the Contract.

**IN WITNESS WHEREOF**, Surety and Contractor, intending to be legally bound hereby, subject to the terms stated herein, do each cause this Labor and Material Payment Bond to be duly executed on its behalf by its authorized officer, agent or representative.

DATED this \_\_\_\_\_ day of \_\_\_\_\_, 2\_\_\_\_\_, \_\_\_\_\_ BOND NUMBER \_\_\_\_\_  
*(shall be no earlier than Date of Contract)*

CONTRACTOR

SURETY

By: \_\_\_\_\_  
(Seal)

By: \_\_\_\_\_  
(Seal)

Print Name: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Title: \_\_\_\_\_

Print Title: \_\_\_\_\_  
(Attach Power of Attorney)

Witness: \_\_\_\_\_

Witness: \_\_\_\_\_

*(Additional Signatures, if any, appear on attached page)*

**SE-357****Labor and Material Payment Bond****NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT:**

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Agency to pay for all labor, materials and equipment required for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to the Agency, this obligation shall be null and void if the Contractor:
  - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants; and
  - 2.2 Defends, indemnifies and holds harmless the Agency from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Contract.
3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.
4. With respect to Claimants, and subject to the provisions of Title 29, Chapter 5 and the provisions of §11-35-3030(2)(c) of the SC Code of Laws, as amended, the Surety's obligation under this Bond shall arise as follows:
  - 4.1 Every person who has furnished labor, material or rental equipment to the Contractor or its subcontractors for the work specified in the Contract, and who has not been paid in full therefore before the expiration of a period of ninety (90) days after the date on which the last of the labor was done or performed by him or material or rental equipment was furnished or supplied by him for which such claim is made, shall have the right to sue on the payment bond for the amount, or the balance thereof, unpaid at the time of institution of such suit and to prosecute such action for the sum or sums justly due him.
  - 4.2 A remote claimant shall have a right of action on the payment bond upon giving written notice by certified or registered mail to the Contractor within ninety (90) days from the date on which such person did or performed the last of the labor or furnished or supplied the last of the material or rental equipment upon which such claim is made.
  - 4.3 Every suit instituted upon a payment bond shall be brought in a court of competent jurisdiction for the county or circuit in which the construction contract was to be performed, but no such suit shall be commenced after the expiration of one year after the day on which the last of the labor was performed or material or rental equipment was supplied by the person bringing suit.
5. When the Claimant has satisfied the conditions of paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:
  - 5.1 Send an answer to the Claimant, with a copy to the Agency, within sixty (60) days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
  - 5.2 Pay or arrange for payment of any undisputed amounts.
  - 5.3 The Surety's failure to discharge its obligations under this paragraph 5 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a claim. However, if the Surety fails to discharge its obligations under this paragraph 5, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs to recover any sums found to be due and owing to the Claimant.
6. Amounts owed by the Agency to the Contractor under the

Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any Performance Bond. By the Contractor furnishing and the Agency accepting this Bond, they agree that all funds earned by the contractor in the performance of the Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Agency's prior right to use the funds for the completion of the Work.

7. The Surety shall not be liable to the Agency, Claimants or others for obligations of the Contractor that are unrelated to the Contract. The Agency shall not be liable for payment of any costs or expenses of any claimant under this bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

8. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related Subcontracts, purchase orders and other obligations.

9. Notice to the Surety, the Agency or the Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, the Agency or the contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

10. By the Contractor furnishing and the Agency accepting this Bond, they agree that this Bond has been furnished to comply with the statutory requirements of the South Carolina Code of Laws, as amended, and further, that any provision in this Bond conflicting with said statutory requirements shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

11. Upon request of any person or entity appearing to be a potential beneficiary of this bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

12. Any dispute, suit, action or proceeding arising out of or relating to this Bond shall be governed by the laws of the State of South Carolina.

**13. DEFINITIONS**

**13.1 Claimant:** An individual or entity having a direct contract with the Contractor or with a Subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of the Contractor and the Contractor's Subcontractors, and all other items for which a mechanic's lien might otherwise be asserted.

**13.2 Remote Claimant:** A person having a direct contractual relationship with a subcontractor of the Contractor or subcontractor, but no contractual relationship expressed or implied with the Contractor.

**13.3 Contract:** The agreement between the Agency and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

**CONSTRUCTION CHANGE ORDER****Change Order No.:****Agency:** University of South Carolina**Project Number:** H27-6107**Project Name:** 1600 Hampton Annex - Deferred Maintenance**Contractor:****Contract Dated:****For:****This Contract is changed as follows:** *(Insert description of change in space provided below)***Adjustments in the Contract Sum:**

- |   |  |        |
|---|--|--------|
| 1. Original Contract Sum: -----                                       |  |        |
| 2. Change in Contract Sum by previously approved Change Orders: ----- |  |        |
| 3. Contract Sum prior to this Change Order: -----                     |  | \$0.00 |
| 4. Amount of this Change Order: -----                                 |  |        |
| 5. New Contract Sum, including this Change Order: -----               |  | \$0.00 |

**Adjustments in Contract Time:**

- |  |      |
|--|------|
| 1. Original Substantial Completion Date: -----               |      |
| 2. Sum of previously approved increases and decreases: ----- | Days |
| 3. Changes in Days for this Change Order: -----              | Days |
| 4. New Substantial Completion Date: -----                    |      |

**Contractor Acceptance:****BY:** \_\_\_\_\_ **Date:** \_\_\_\_\_*(Signature of Representative)***Print Name:** \_\_\_\_\_**Architect Recommendation for Acceptance:****BY:** \_\_\_\_\_ **Date:** \_\_\_\_\_*(Signature of Representative)***Print Name:** \_\_\_\_\_**Agency Acceptance and Certification****BY:** \_\_\_\_\_ **Date:** \_\_\_\_\_*(Signature of Representative)***Print Name:** \_\_\_\_\_☐ Change is within Agency Construction Procurement Certification amount of \_\_\_\_\_☐ Change is not within Agency Construction Procurement Certification amount**Office of the State Engineer Authorization for change not within Agency Construction Procurement Certification:****Signature of OSE Project Manager:** \_\_\_\_\_**Date:** \_\_\_\_\_



Project Name: USC 1600 Hampton Annex - Deferred Maintenance  
Project Number: H27-6107  
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 the period of one (1) year from the 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 therefrom, at no cost to the Owner, provided however, that the following are excluded from this guarantee:

Defects or failures resulting from abuse by the 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 officer  
of the Contracting Firm.

SWORN TO before me this  
\_\_\_\_\_ day of \_\_\_\_\_ 19 \_\_\_\_\_ (SEAL)  
\_\_\_\_\_ (STATE)

My commission expires \_\_\_\_\_

ONE YEAR GUARANTEE FORM





### CAMPUS VEHICLE EXPECTATIONS

1. All motorized vehicles on the University campus are expected to travel and park on roadways and/or in parking stalls.
2. All motorized vehicle traffic on USC walkways must first receive the Landscape Manager's authorization. Violators may be subject to fines and penalties.
3. All motorized vehicles that leak or drip liquids are prohibited from traveling or parking on walks or landscaped areas.
4. Contractors, vendors, and delivery personnel are required to obtain prior to parking authorization before parking in a designated space. Violators may be subject to fines and/or penalties. See Item 10 below.
5. Drivers of equipment or motor vehicles that damage university hardscape or landscape will be held personally responsible for damages and restoration expense.
6. Vehicle drivers who park on landscape or drives must be able to produce written evidence of need or emergency requiring parking on same.
7. 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.
8. All drivers of equipment and vehicles will be respectful of University landscape, equipment, structures, fixtures and signage.
9. All incidents of property damage will be reported to Parking Services or the Work Management Center.
10. Parking on campus is restricted to spaces designated by Parking Services at the beginning of the project. Once the project manager and contractor agree on how many spaces are needed, the project manager will obtain a placard for each vehicle. This placard must be hung from the mirror of the vehicle, otherwise a ticket will be issued and these tickets cannot be "fixed." Parking spaces are restricted to work vehicles only; no personal vehicles.



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section includes the following:
1. Work covered by the Contract Documents.
  2. Use of premises.
  3. Owner's occupancy requirements.
  4. Specification formats and conventions.

### 1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: **1600 HAMPTON ANNEX - DEFERRED MAINTENANCE**
- B. Project Location: **COLUMBIA, SOUTH CAROLINA**
- C. Owner: **UNIVERSITY OF SOUTH CAROLINA**
1. Owner's Representative: **CHRISTIAN MERGNER, PROJECT MANAGER,  
FACILITIES PLANNING AND CONSTRUCTION, UNIVERSITY OF SOUTH  
CAROLINA**
- D. The Work consists of **1600 HAMPTON ANNEX - DEFERRED MAINTENANCE** per the contract documents.
- E. The project will be constructed under a single prime contract.

### 1.3 WORK UNDER OTHER CONTRACTS

- A. Concurrent Work: Owner may elect to award separate contract(s) for other construction operations at Project site. Those operations may be conducted simultaneously with work under this Contract.

### 1.4 USE OF PREMISES

- A. Use of Site: Limit use of premises to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Owner Occupancy: Allow for Owner occupancy of Project site.
  2. Driveways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

### 1.5 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 48-division format and CSI/CSC's "MasterFormat" 2011 Version numbering system.
1. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.

- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
  2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
    - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

1.0 GENERAL

1.1 SCOPE: This section lists known special conditions that exist or pertain to the Contract Documents. If asbestos abatement needed, the Owner will contract outside of this scope.

1.2 SPECIAL CONDITIONS:

**A. ASBESTOS: It is the intent of the plans and specifications to specify only non-asbestos containing materials.** Asbestos is defined as follows:

**ASBESTOS** - The asbestiform varieties of serpentine (chrysotile), rie bekite (crocidolite), cummingtonite grunerite (amosite), anthrophyllite, actinolite, and tremolite.

**Materials containing any form of asbestos in any percentages shall not be used.**

PRODUCTS SHALL BE ASBESTOS FREE. Suppliers supplying materials containing asbestos in any form or percentages shall be responsible for the removal of these materials if delivered or installed and any cleanup required, in addition to the installation of asbestos free materials.

**B. HEAVY METALS:** It is the intent of these plans and specifications to specify materials containing NO HEAVY METALS BY DESIGN. Heavy metals are defined as mercury, lead and other metals known to cause bodily harm. Lead products may be used in roofing applications. Lead soldering for any water or waste water is not allowed. Products containing heavy metals may be used only with the written permission of the architect. Cleanup for products, containing heavy metals, installed without written permission shall be at the contractors expense. Installation of new non-heavy metal products shall be at no cost to the owner.

**C. The Contractor, His Subcontractors and/or Personnel Employed by either shall:**

1. Remain in the designated work areas.
2. Maintain a safe work site at all times.
3. Schedule all work with the Owner.
4. Remain fully clothed at all times on or around job site.
5. Have no verbal contact with students or staff.
6. Sunday work will be allowed.
7. In accordance with State Law, this facility is a No Smoking Facility. An exterior smoking area will be established by the Owner and any smoking shall occur at that area.
8. During rainy weather the general contractor shall maintain adequate forces on the job to keep water out of spaces at tie-ins and other similar areas where construction activities have compromised existing walls and roof systems. Also provide "dams", diversions, etc. as required to keep occupied spaces dry.

3.0 NOT USED

END OF SECTION 01 10 10A



1.0 GENERAL

- 1.1 Time for Completion: Attention is directed to the fact that a clean site is urgently needed by the Owner and that time is of the essence; for this reason, it shall be agreed that the Contractor shall begin work and complete work as listed in the following schedule:

Building Area	Ordering of Materials	Start Date	Substantial Completion
ALL	Upon Notice to Proceed	Upon Notice To Proceed	84 calendar days

1.2 SUBSTANTIAL COMPLETION

- A. The Contractor shall inspect the entire project with his subcontractors. A list of incorrect/incomplete items will be forwarded to the Architect. The Contractor shall immediately start correcting this list and date the items as they are completed. THE ARCHITECT NOR THE ENGINEERS WILL START THEIR PUNCH LIST PRIOR TO RECEIVING THE CONTRACTOR'S COMPLETED LIST.
- B. The final inspection shall be made by the Architect and his consultants after the contractors list with dated corrections is received by the Architect. A list of these incorrect/incomplete items will be forwarded to the contractor.
- C. Contractor shall have 15 calendar days after substantial completion date to correct all items on the architect's punch list, and at that time shall certify in writing that all items are correct and complete. Monies will be withheld from the contract until all Punch List items are acceptable by the Architect. The architect, alone, will determine amounts to be withheld and multiply this number by a factor of three (3). A minimum of 3.5% of the total project cost will be held until the punch list is 100% complete. Punch list shall be corrected at the owner's convenience.

1.3 LIQUIDATED DAMAGES:

Should the Contractor fail to substantially complete the work under this Contract within the time specified herein before, or such later date as may result from an authorized extension of time, he shall pay to the Owner, as liquidated damages, the sum of Two Hundred Fifty Dollars (\$250.00) per calendar day past the completion date. No liquidated damages will be charged if the delay is due to the availability of materials.

END OF SECTION 01 20 00





- 1.0 GENERAL
- 1.1 RELATED DOCUMENTS:
  - A. Drawings and general provisions of Contract including General & Supplementary Conditions and other Division-1 specification sections, apply to work of this section.
- 1.2 SCOPE: This section describes the allowances that are to be included in the contractor's bid and entered on the Form of Proposal
- 1.3 ALLOWANCE: The following allowances to be used as directed by Architect. Any unused portion of these allowances shall be credited to the Owner at the completion of the work. These allowances shall be considered actual costs and the contractor's profit, insurance, taxes, shipping, installation cost, and protection of installed products, will be figured in the bids, except as otherwise noted.
- 1.4 NONE

END OF SECTION 01 21 00



**PART 1 - GENERAL**

**1.01 DESCRIPTION**

- A. Work Includes: Provide alternative bid proposals as described in this Section.
- B. Related Documents:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, AIA Documents A132 and A232, as amended, General Conditions, Supplementary Conditions, and all applicable Sections in Division 1 of these Specifications.
- C. Procedures:
  - 1. Provide alternative bids to be added to or deducted from the amount of the Base Bid if the corresponding change in scope is accepted by the Owner.
  - 2. Include within the alternative bid prices all costs, including materials, submittals, installation, and fees to provide a complete, operable and finished system.
  - 3. Show the proposed alternative amounts opposite their proper description of the Bid Form.
  - 4. See Plans and Subparagraph 1.01.D of this specification for a description of alternates.
- D. Alternative bid pricing is requested for the following:
- E. **Alternate No 1:**  
Include the amount to be added to the Base Bid to remove existing plumbing lift station and replace with new as indicated in the plumbing drawings.

END OF SECTION



PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing contract modifications. These projects will utilize the AIA Documents listed.

1.2 MINOR CHANGES IN THE WORK

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

1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  - 2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.
    - d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Architect.
  - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  - 4. Include costs of labor and supervision directly attributable to the change.

5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
  6. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.
- C. Proposal Request Form: Use AIA Document G709 for Proposal Requests.
- 1.4 CHANGE ORDER PROCEDURES
- A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on form SE-480 Construction Change Order (2011).
- 1.5 CONSTRUCTION CHANGE DIRECTIVE
- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 24 00

## PART 1 - GENERAL

### 1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment. Contractor shall coordinate with owner.

### 1.2 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Application for Payment forms with Continuation Sheets.
  2. Submit the Schedule of Values to Owner at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
  3. Sub-schedules: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the Schedule of Values:
    - a. Project name and location.
    - b. Name of Architect.
    - c. Architect's project number.
    - d. Contractor's name and address.
    - e. Date of submittal.
  2. Submit draft of AIA Document G703 Continuation Sheets.
  3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
  4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
  5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
  6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
  7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

- a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

### 1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Progress payments shall be submitted to Architect by the 25th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
- D. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Owner will return incomplete applications without action.
  1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
  2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- F. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Owner by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
  1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
  1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
  2. When an application shows completion of an item, submit final or full waivers.
  3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
  4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.



- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  - 1. List of subcontractors.
  - 2. Schedule of Values.
  - 3. Contractor's Construction Schedule (preliminary if not final).
  - 4. List of Contractor's staff assignments.
  - 5. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  - 6. Initial progress report.
  - 7. Report of preconstruction conference.
  - 8. Certificates of insurance and insurance policies.
- I. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
  - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  - 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
  - 1. Evidence of completion of Project closeout requirements.
  - 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  - 3. Updated final statement, accounting for final changes to the Contract Sum.
  - 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  - 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  - 6. AIA Document G707, "Consent of Surety to Final Payment."
  - 7. Evidence that claims have been settled.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00



## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative provisions for coordinating demolition operations on Project including, but not limited to, the following:
  - 1. Requests for Information (RFIs).
  - 2. Project meetings.
- B. Related Sections:
  - 1. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
  - 2. Division 23 Section "HVAC, Ductwork" for general installation, coordination drawings and efforts required with other trades adjacent to ductwork.

### 1.2 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information from each other during demolition.

### 1.3 COORDINATION

- A. Coordination: Coordinate demolition operations to ensure efficient and orderly removal of each part of the Work. Coordinate demolition operations that depend on each other for proper removal and disconnection.
  - 1. Schedule demolition operations in sequence required to obtain the best results where removal of one part of the Work depends on removal of other components, before or after its own removal.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other demolition activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's demolition schedule.
  - 2. Preparation of the schedule of values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Progress meetings.
  - 5. Project closeout activities.

### 1.4 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
  2. Project number.
  3. Date.
  4. Name of Contractor.
  5. Name of Architect.
  6. RFI number, numbered sequentially.
  7. RFI subject.
  8. Specification Section number and title and related paragraphs, as appropriate.
  9. Drawing number and detail references, as appropriate.
  10. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  11. Contractor's signature.
  12. Attachments: Include sketches, descriptions, measurements, photos, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: AIA Document G716 or Contractor's software-generated form with substantially the same content as indicated above, acceptable to Architect. Form type will be determined at the Pre-construction Conference.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
    - a. Requests for coordination information already indicated in the Contract Documents.
    - b. Requests for adjustments in the Contract Time or the Contract Sum.
    - c. Incomplete RFIs or inaccurately prepared RFIs.
  2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
  3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Maintain the log on a daily basis and make available for view to the Architect at any time requested. Submit log monthly. Include the following:
1. Project name.
  2. Name and address of Contractor.
  3. Name and address of Architect.
  4. RFI number including RFIs that were dropped and not submitted.
  5. RFI description.
  6. Date the RFI was submitted.
  7. Date Architect's response was received.
  8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
  9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

#### 1.5 PROJECT MEETINGS

- A. General: Contractor will schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Contractor will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
1. Attendees: Authorized representatives of Owner, the Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for RFIs.
    - g. Procedures for testing and inspecting.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. Sustainable design requirements.
    - l. Use of the premises.
    - m. Work restrictions.
    - n. Working hours.

- o. Responsibility for temporary facilities and controls.
      - p. Construction waste management and recycling.
      - q. Parking availability.
      - r. Office, work, and storage areas.
      - s. Equipment deliveries and priorities.
      - t. First aid.
      - u. Security.
      - v. Progress cleaning.
  - 3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Progress Meetings: Contractor will conduct progress meetings at weekly intervals.
- 1. Attendees: In addition to representatives of Owner, the Commissioning Authority, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of abatement operations.
      - 4) Access.
      - 5) Site utilization.
      - 6) Temporary facilities and controls.
      - 7) Progress cleaning.
      - 8) Quality and work standards.
      - 9) Status of correction of deficient items.
      - 10) Field observations.
      - 11) Status of RFIs.
      - 12) Status of proposal requests.
      - 13) Status of Change Orders.
      - 14) Documentation of information for payment requests.
  - 3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
    - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00





## PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of demolition during performance of the Work, including the following:
  - 1. Contractor's demolition schedule.
  - 2. Daily demolition reports.
  - 3. Field condition reports.

### 1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the demolition project. Activities included in a demolition schedule consume time and resources.
  - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
  - 2. Predecessor Activity: An activity that precedes another activity in the network.
  - 3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a demolition project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of the Project.
- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Float: The measure of leeway in starting and completing an activity.
  - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
  - 1. PDF electronic file.
  - 2. Paper copies – 3 copies or greater as determined by the Architect.
- B. Contractor's Demolition Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
  - 1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.

- C. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
  - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
  - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
- D. Daily Construction Reports: Submit at weekly intervals or as directed by the Architect.
- E. Field Condition Reports: Submit at time of discovery of differing conditions.

#### 1.4 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of demolition activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's demolition schedule with the schedule of values, list of subcontracts, progress reports, payment requests, and other required schedules and reports.
  - 1. Secure time commitments for performing critical elements of the Work from entities involved.
  - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

### PART 2 - PRODUCTS

#### 2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice of Award to date of final completion.
  - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
  - 1. Activity Duration: Define activities so no activity is longer than 10 days, unless specifically allowed by Architect.
  - 2. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
  - 3. Punch List and Final Completion: Include not more than 15 days for punch list prior to final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
  2. Work under More Than One Contract: Include a separate activity for each contract.
  3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
  4. Work Restrictions: Show the effect of the following items on the schedule:
    - a. Coordination with existing construction.
    - b. Limitations of continued occupancies.
    - c. Uninterruptible services.
    - d. Use of premises restrictions.
    - e. Provisions for future construction.
    - f. Seasonal variations.
    - g. Environmental control.
  5. Work Stages: Indicate important stages of construction for each major portion of the Work.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final completion, and the following interim milestones:
1. Completion date if different from the Final Completion date.
- E. Recovery Schedule: When periodic update indicates the Work is 10 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule.
- F. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.
1. Utilize Primavera, Prolog, or other operating system acceptable to the architect and owner.

## 2.2 CONTRACTOR'S DEMOLITION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Start-up Network Diagram: Submit diagram within 14 days of date established for the Notice of Award. Outline significant demolition activities for the first 30 days of the project. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's demolition schedule using a time-scaled CPM network analysis diagram for the Work.
1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 14 days after date established for the Notice of Award.
    - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
  2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.

3. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to correlate with Contract Time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the start-up network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
    - a. Mobilization and demobilization.
    - b. Delivery.
    - c. Utility interruptions.
    - d. Installation.
    - e. Work by Owner that may affect or be affected by Contractor's activities.
    - f. Punch list and final completion.
    - g. Activities occurring following final completion.
  2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
  3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list. Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
  2. Description of activity.
  3. Principal events of activity.
  4. Immediate preceding and succeeding activities.
  5. Early and late start dates.
  6. Early and late finish dates.
  7. Activity duration in workdays.
  8. Average size of workforce.
- G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
  2. Changes in early and late start dates.
  3. Changes in early and late finish dates.
  4. Changes in activity durations in workdays.
  5. Changes in the critical path.
  6. Changes in the Contract Time.

## 2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
  2. List of separate contractors at Project site.
  3. Approximate count of personnel at Project site.
  4. Equipment at Project site.
  5. Material deliveries.
  6. High and low temperatures and general weather conditions, including presence of rain or snow.
  7. Accidents.
  8. Meetings and significant decisions.
  9. Unusual events.
  10. Stoppages, delays, shortages, and losses.
  11. Meter readings and similar recordings.
  12. Emergency procedures.
  13. Orders and requests of authorities having jurisdiction.
  14. Change Orders received and implemented.
  15. Construction Change Directives received and implemented.
  16. Services connected and disconnected.
  17. Equipment or system tests and startups.
  18. Partial completions and occupancies.
  19. Substantial Completions authorized.
- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S DEMOLITION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
  2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect, Construction Manager, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
  2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their

assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 32 00

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Reviewed": When used to convey Architect's action on Contractor's submittals, applications, and requests, "reviewed" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

### 1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated. For standards and publications referenced in Chapter 35 of IBC 2003, and other codes referenced therein, the effective date shall be the date of the standard referenced in that code unless a more current publication is specified in the individual sections of this Project Manual.

- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

- D. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from Access Board <a href="http://www.access-board.gov">www.access-board.gov</a>	(800) 872-2253 (202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office <a href="http://www.gpoaccess.gov/cfr/index.html">www.gpoaccess.gov/cfr/index.html</a>	(888) 293-6498 (202) 512-1530
CRD		
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point <a href="http://www.dodssp.daps.mil">www.dodssp.daps.mil</a>	(215) 697-6257
DSCC	Defense Supply Center Columbus (See FS) Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Ave, NW Washington DC 20460 <a href="http://www.epa.gov">www.epa.gov</a>	(202) 272-0167
FED-STD	Federal Standard (See FS)	
FS	Federal Specification Available from Department of Defense Single Stock Point <a href="http://www.dodssp.daps.mil">www.dodssp.daps.mil</a>  Available from General Services Administration <a href="http://www.fss.gsa.gov">www.fss.gsa.gov</a>  Available from National Institute of Building Sciences <a href="http://www.nibs.org">www.nibs.org</a>	(215) 697-6257 (202) 501-1021 (202) 289-7800
FTMS	Federal Test Method Standard (See FS)	
ICC-ES ICC	Evaluation Service, Inc. <a href="http://www.icc-es.org">www.icc-es.org</a> (562) 699-0543	(800) 423-6587



MIL	(See MILSPEC)	
MIL-STD	(See MILSPEC)	
MILSPEC	Military Specification and Standards Available from Department of Defense Single Stock Point <a href="http://www.dodssp.daps.mil">www.dodssp.daps.mil</a>	(215) 697-6257
NES	(Formerly: National Evaluation Service) (See ICC-ES)	
OSHA		
UFAS	Uniform Federal Accessibility Standards Available from Access Board <a href="http://www.access-board.gov">www.access-board.gov</a>	(800) 872-2253 (202) 272-0080

#### 1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association, Inc. (The) <a href="http://www.aluminum.org">www.aluminum.org</a>	(202) 862-5100
AAADM	American Association of Automatic Door Manufacturers <a href="http://www.aaadm.com">www.aaadm.com</a>	(216) 241-7333
AGC	Associated General Contractors of America (The) <a href="http://www.agc.org">www.agc.org</a>	(703) 548-3118
AIA	American Institute of Architects (The) <a href="http://www.aia.org">www.aia.org</a>	(800) 242-3837 (202) 626-7300
ANSI	American National Standards Institute <a href="http://www.ansi.org">www.ansi.org</a>	(202) 293-8020
BHMA	Builders Hardware Manufacturers Association <a href="http://www.buildershardware.com">www.buildershardware.com</a>	(212) 297-2122
CSI	Construction Specifications Institute (The) <a href="http://www.csinet.org">www.csinet.org</a>	(800) 689-2900 (703) 684-0300
DHI	Door and Hardware Institute <a href="http://www.dhi.org">www.dhi.org</a>	(703) 222-2010
GANA	Glass Association of North America	(785) 271-0208

	www.glasswebsite.com	
GRI	(Now GSI)	
GS	Green Seal (202) 872-6400 www.greenseal.org	
NGA	National Glass Association www.glass.org	(703) 442-4890
PDCA	Painting & Decorating Contractors of America www.pdca.com (314) 514-7322	(800) 332-7322
UL	Underwriters Laboratories Inc. www.ul.com (847) 272-8800	(800) 285-4476
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(800) 223-2301 (847) 299-5200
C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.		
BOCA	BOCA International, Inc. (See ICC)	
CABO	Council of American Building Officials (See ICC)	
IAPMO	International Association of Plumbing and Mechanical Officials www.iapmo.org	(909) 472-4100
ICBO	International Conference of Building Officials (See ICC)	
ICBO ES	ICBO Evaluation Service, Inc. (See ICC-ES)	
ICC	International Code Council (Formerly: CABO - Council of American Building Officials) www.iccsafe.org	(703) 931-4533
ICC-ES	ICC Evaluation Service, Inc. www.icc-es.org (562) 699-0543	(800) 423-6587
NES	National Evaluation Service (See ICC-ES)	
SBCCI	Southern Building Code Congress International, Inc. (See ICC)	

- D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CPSC	Consumer Product Safety Commission www.cpsc.gov (301) 504-6816	(800) 638-2772
DOC	Department of Commerce www.commerce.gov	(202) 482-2000
DOD	Department of Defense www.dodssp.daps.mil	(215) 697-6257
DOE	Department of Energy www.eren.doe.gov	(202) 586-9220
NIST	National Institute of Standards and Technology www.nist.gov	(301) 975-6478
OSHA	Occupational Safety & Health Administration <a href="http://www.osha.gov">www.osha.gov</a>	(800) 321-6742 (202) 693-1999
PHS	Office of Public Health and Science <a href="http://phs.os.dhhs.gov">http://phs.os.dhhs.gov</a>	(202) 690-7694
SD	State Department www.state.gov	(202) 647-4000
USDA	Department of Agriculture www.usda.gov	(202) 720-2791

- E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CBHF	State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation www.dca.ca.gov/bhfti	(800) 952-5210 (916) 574-2041
CPUC	California Public Utilities Commission www.cpuc.ca.gov	(415) 703-2782

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00



PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Section:
  - 1. Division 01 Section "Summary" for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.
- B. Temporary Electricity:
  - 1. Cost: By Contractor.
- C. Temporary Heating:
  - 1. Cost of Energy: By Contractor.
- D. Temporary Cooling:
  - 1. Cost of Energy: By Contractor
- E. Temporary Water Service:
  - 1. Cost of Water Used: By Contractor

1.3 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in and ICC/ANSI A117.1.

1.4 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS (As needed to secure demolition area)

- A. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts.
- B. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete or galvanized steel bases for supporting posts.

2.2 TEMPORARY FACILITIES

- A. Toilet Facilities

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

1. Provide and maintain suitable quality water service for construction operations at time of project mobilization.
  2. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.
- B. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
1. Provide power service required from utility source.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. Traffic Controls: Comply with requirements of authorities having jurisdiction.
1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  2. Maintain access for fire-fighting equipment and access to fire hydrants.
- B. Parking: Provide temporary parking areas for construction personnel.
- C. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
- D. Waste Disposal Facilities: Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."
- E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Temporary Erosion and Sedimentation Control: Comply with requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- C. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- D. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- E. Site Enclosure Fence: Before demolition operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
  2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

- F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- G. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- H. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
  - 1. Prohibit smoking in construction areas.
  - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

### 3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

END OF SECTION 01 50 00



PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
  - 1. Disposing of nonhazardous demolition and construction waste.

1.3 DEFINITIONS

- A. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- B. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 2 - PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 IMPLEMENTATION

- A. General: Implement waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

3.2 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
  - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Burning: Burning of waste materials is not permitted on Owner's property,
- D. Disposal: Transport waste materials off Owner's property and legally dispose of them.

- E. Refer to Specification Section 02 41 16 Building Demolition for recycling requirements.

END OF SECTION 01 52 40

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Demolition and removal of selected portions of a building or structure.
  - 2. Demolition and removal of selected site elements.
  - 3. Repair procedures for selective demolition operations.
- B. Related Sections include the following:
  - 1. Division 1 Section "Summary" for use of the premises and phasing requirements.
  - 2. Division 1 Section "Work Restrictions" for restrictions on use of the premises due to Owner or tenant occupancy.
  - 3. Division 1 Section "Construction Progress Documentation" for preconstruction photographs taken before selective demolition.
  - 4. Division 1 Section "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for selective demolition operations.

### 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: Detach items from existing construction and deliver them to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

### 1.4 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.
- B. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain Owner's

property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.

1. Coordinate with Owner's historical adviser, who will establish special procedures for removal and salvage.

#### 1.5 SUBMITTALS

- A. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- B. Proposed Dust-Control and Noise-Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.
- C. 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 school faculty and students on-site operations are uninterrupted.
  2. Interruption of utility services.
  3. Coordination for shutoff, capping, and continuation of utility services.
  4. Use of elevator and stairs.
  5. Locations of temporary partitions and means of egress.
  6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- D. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.
- E. Pre-demolition Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.
- F. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

#### 1.6 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Professional Engineer Qualifications: Comply with Division 1 Section "Quality Requirements."
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.

1.7 PROJECT CONDITIONS

- A. Owner will occupy adjacent buildings on site. Conduct selective demolition so Owner's operations will not be disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
- B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
  - 1. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.
- C. Owner assumes no responsibility for condition of areas to be selectively demolished.
  - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- D. Hazardous Materials: Hazardous materials are present in building to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
  - 1. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
  - 2. If materials suspected of containing hazardous materials are encountered, other than those outlined in the report, do not disturb; immediately notify Architect and Owner.
- E. Storage or sale of removed items or materials on-site will not be permitted.
- 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.

1.8 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.
  - 1. If possible, retain original Installer or fabricator to patch the exposed Work listed below that is damaged during selective demolition. If it is impossible to engage original Installer or fabricator, engage another recognized experienced and specialized firm.
    - a. Processed concrete finishes.
    - b. Stonework and stone masonry.
    - c. Matched-veneer woodwork.
    - d. Preformed metal panels.
    - e. Firestopping.
    - f. Window wall system.
    - g. Fluid-applied flooring.
    - h. Aggregate wall coating.
    - i. HVAC enclosures, cabinets, or covers.

## PART 2 - PRODUCTS

### 2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
  - 1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  - 2. Use materials whose installed performance equals or surpasses that of existing materials.
- B. Comply with material and installation requirements specified in individual Specification Sections.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- 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. Engage a professional engineer to survey 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 demolition operations.
- F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

### 3.2 UTILITY SERVICES

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
- B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
  - 1. Provide at least 72 hours' notice to Owner if shutdown of service is required during changeover.

- C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
  - 1. Owner will arrange to shut off indicated utilities when requested by Contractor.
  - 2. Arrange to shut off indicated utilities with utility companies.
  - 3. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.
  - 4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
- D. Utility Requirements: Refer to Sections 22 through 26 for shutting off, disconnecting, removing, and sealing or capping utilities. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

### 3.3 PREPARATION

- A. Dangerous Materials: Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.
- B. 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.
  - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
  - 2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
  - 3. Protect existing site improvements, appurtenances, and landscaping to remain.
  - 4. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
- C. 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. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
- D. Temporary Enclosures: Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
- E. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.
- F. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  1. Strengthen or add new supports when required during progress of selective demolition.

### 3.4 POLLUTION CONTROLS

- A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
  1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
  2. Wet mop floors to eliminate trackable dirt and wipe down walls and doors of demolition enclosure. Vacuum carpeted areas.
- B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- C. Cleaning: 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.

### 3.5 SELECTIVE DEMOLITION

- 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. Proceed with selective demolition systematically, from lowest to highest level.
  2. 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.
  3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  4. 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 fire watch and portable fire-suppression devices during flame-cutting operations.
  - 5. Maintain adequate ventilation when using cutting torches.
  - 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  - 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  - 8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  - 9. Dispose of demolished items and materials promptly.
  - 10. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.
- B. Existing Facilities: Comply with building manager's requirements for using and protecting elevators, stairs, walkways, loading docks, building entries, and other building facilities during selective demolition operations.
- C. Removed and Salvaged Items: Comply with the following:
- 1. Clean salvaged items.
  - 2. Pack or crate items after cleaning. Identify contents of containers.
  - 3. Store items in a secure area until delivery to Owner.
  - 4. Transport items to Owner's storage area designated by Owner.
  - 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items: Comply with the following:
- 1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
  - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  - 3. Protect items from damage during transport and storage.
  - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect 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 and cleaned and reinstalled in their original locations after selective demolition operations are complete.
- F. Concrete: Demolish in small sections. Cut concrete to a depth of at least 3/4 inch at junctures with construction to remain, using power-driven saw. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete indicated for selective demolition. Neatly trim openings to dimensions indicated.
- G. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.
- H. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- I. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

- J. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI-WP and its Addendum. Refer to the Limited Asbestos Containing Materials Investigation Report, prepared by F & ME Consultants, included in the project manual for locations of asbestos containing mastic. Removal shall be performed by a licensed asbestos abatement contractor using established EPA-compliant procedures.
- K. Roofing: Remove no more existing roofing than can be covered in one day by new roofing. Refer to applicable Division 7 Section for new roofing requirements.
- L. Air-Conditioning Equipment: Remove equipment without releasing refrigerants.

### 3.6 PATCHING AND REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.
- B. Patching: Comply with Division 1 Section "Cutting and Patching."
- C. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
  - 1. Completely fill holes and depressions in existing masonry walls that are to remain with an approved masonry patching material applied according to manufacturer's written recommendations.
- D. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.
- E. Floors and Walls: Where walls or partitions that are demolished extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  - 1. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
  - 2. Where patching occurs in a painted surface, apply primer and intermediate paint coats over patch and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until patch blends with adjacent surfaces.
  - 3. Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
- F. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

### 3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Burning: Do not burn demolished materials.

- C. Burning: Burning of demolished materials will be permitted only at designated areas on Owner's property, providing required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.
- D. Disposal: Transport demolished materials and dispose of at designated spoil areas on Owner's property.
- E. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

END OF SECTION 01 73 20



## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Inspection procedures.
  - 2. Warranties.
  - 3. Final cleaning.
- B. Related Sections include the following:
  - 1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.

### 1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
  - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. Complete final cleaning requirements.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Owner, that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
  - 2. Results of completed inspection will form the basis of requirements for Final Completion.

### 1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
  - 1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
  - 2. Submit certified copy of Owner's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Owner. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled

requirements. Owner will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

#### 1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Include the following information at the top of each page:

- a. Project name.
- b. Date.
- c. Name of Architect.
- d. Name of Contractor.
- e. Page number.

#### 1.6 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Owner for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

### PART 3 - EXECUTION

#### 3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
  - a. Remove tools, construction equipment, machinery, and surplus material from Project site.
  - b. Provide final grading, seeding and mulching.
  - c. Leave Project site clean and ready for Owner.

- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01 77 00





LIST OF DRAWINGS:

<u>DRAWING</u>	<u>DESCRIPTION</u>
T101	TITLE, INDEX & ABBREVIATIONS
D100	DEMOLITION PLAN BASEMENT
D101	DEMOLITION PLAN 1ST FLOOR
D102	DEMOLITION PLAN 2ND & 3RD FLOOR
P001	PLUMBING DETAILS & SCHEDULES
P002	PLUMBING BASEMENT FLOOR PLANS
M001	HVAC NOTES, SYMBOLS, & SCHEDULES
M002	HVAC DETAILS
M101	BASEMENT HVAC DEMOLITION FLOOR PLAN
M102	1ST FLOOR HVAC DEMOLITION FLOOR PLAN
M103	2ND & 3RD FLOOR HVAC DEMOLITION FLOOR PLANS
M104	ROOF HVAC DEMOLITION FLOOR PLAN
M201	BASEMENT HVAC RENOVATION FLOOR PLAN
M202	1ST FLOOR HVAC RENOVATION FLOOR PLAN
M203	2ND & 3RD FLOOR HVAC RENOVATION FLOOR PLANS
M204	ROOF HVAC RENOVATION FLOOR PLAN
E001	ELECTRICAL SYMBOLS & NOTES
E002	ELECTRICAL DEMOLITION PLANS
E301	HVAC POWER PLAN - BASEMENT
E302	HVAC POWER PLAN - 1ST FLOOR
E303	HVAC POWER PLAN - 2ND & 3RD FLOORS
E304	HVAC POWER PLAN - ROOF
E501	FIRE ALARM PLAN - BASEMENT
E502	FIRE ALARM PLAN - 1ST FLOOR
E503	FIRE ALARM PLAN - 2ND & 3RD FLOORS
E601	EXISTING POWER RISER DIAGRAM
E602	FIRE ALARM DETAILS

END OF SECTION 01 80 00



## **SECTION 22 05 00 - MECHANICAL, PLUMBING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Section 23 00 00 MECHANICAL, GENERAL applies to this section of the specifications. Refer to Plumbing drawings (*Shts P1 and P2*) for work and materials for this section of the specifications.
  - 1. Furnish products, materials and equipment as specified herein. Manufacturers and products or materials which are not indicated on drawings or specified will not be accepted.
  - 2. *Refer to 10 day prior approval requirements for substitutions of plumbing equipment, materials, fixtures, fittings, valves, etc. as specified below.*
  - 3. Private label products such as distributed by ProFlo, Brigade, Mainline, etc. will not be accepted as substitution for specified manufacturers for this project.
  - 4. Failure to comply with specifications regarding Prior Approval will require replacement of all materials and products which are not listed in these specifications.
  - 5. Contractor shall order all accepted products and materials immediately after receipt of Engineer shop drawing review comments to insure timely delivery without construction delays. See specifications 3.7 Submittals para. B.3 as applicable.

#### **1.2 GENERAL**

- A. Before construction of project starts, check locations and inverts of existing and proposed pipes, sewers, mains and points of connection to existing utilities. Report to Architect before start of construction any unsatisfactory condition or conflict between plumbing and any other trades. No extra charge will be approved after start of construction from failure to follow these instructions.
- B. All work and materials shall comply with the IPC International Plumbing Code, IFGC International Fuel Gas Code, IBC International Building Code, 2012 editions and all applicable local codes and ordinances.
  - 1. Water heaters and all insulation products and installations shall comply with ASHRAE 90.1, latest edition.
- C. Installation of Plumbing equipment and systems shall be in accordance with the requirements for Seismic of the IBC International Building Code.
- D. Protect fixtures, materials and equipment from theft or against damage. Seal pipe and drain openings by test plugs or rubber "Gem" caps secured with stainless steel bands to prevent debris from being introduced into the drainage system.
  - 1. Duct tape or PVC caps will not be permitted to seal soil, waste, drain or vent pipe openings.
- E. All electrical wiring for plumbing equipment shall be provided under Division 26 of these specifications. Coordinate electrical requirements of all equipment with Division 26 prior to ordering equipment.

- F. Contractor shall verify and coordinate the exact locations and inverts of the underground sewer, water and roof drain lines and the connections to the utilities serving this site prior to start of construction. *It is extremely important that these locations and inverts are verified at the start of this project to prevent any conflicts during construction.*
- G. Fees for construction permits shall be included.

### 1.3 SCOPE

- A. Provide all related equipment, labor, materials, and operations and accessories required for the installation of complete and quietly operating plumbing systems as indicated in accordance with the plans and specifications. This shall include the following:
- Soil, Waste, Drain and Vent Piping
  - Condensate Drain Piping
  - Domestic Hot and Cold Water Piping
  - Pipe Insulation
  - Pipe Caulking Materials
  - Pipe Hangers and Supports including Seismic Shop Drgs
  - Pipe Sleeves
  - Valves and Identification
  - Floor Drain
  - Electric Water Heater
  - Thermostatic Mixing Valve
  - Thermometers
  - Aquastat
  - Expansion Tank
  - Lift Station
  - Sump Pump
  - Tests
  - Sterilization of Domestic Water Piping and Certificates
  - Plumbing Submittal Data
  - Project Record Drawings
  - Plumbing Maintenance Manuals

### 1.4 ALTERNATES

- A. Refer to the Architectural drawings, specifications and addenda for descriptions of all Alternates by the Architect as they apply to Division 22 Mechanical, Plumbing.
- B. It shall be the responsibility of the contractor to coordinate all Plumbing work under Alternates and to notify the Engineer prior to bid date if any discrepancies occur concerning the Alternates or if any clarification of work under Alternates is required. No extra charge will be approved after start of construction from failure to follow these instructions.

### 1.5 CONSTRUCTION PHASING

- A. Coordinate all construction with the Architect, Owner and General Contractor prior to starting any work. Phasing of work relating to Plumbing shall be closely coordinated to prevent problems. Notify Engineer/Architect prior to starting work if any problems exist concerning phasing of work.

## PART 2 - PRODUCTS

### 2.1 SOIL, WASTE, DRAIN AND VENT PIPE

- A. Coordinate with existing conditions including Plumbing and Architectural drawings prior to start of demolition or construction.
- B. Below Slab/Grade: Soil, waste, drain and vent piping shall be cast iron pipe with bell and spigot fittings. Pipe and fittings shall be in accordance with ASTM A-74 and WW-P-401d.
  - 1. Cast iron pipe and fittings shall be as manufactured by Charlotte Pipe and Foundry or Tyler Pipe and shall bear the collective trademark of the Cast Iron Soil Pipe Institute and listed by NSF International.
- C. Above Slab: Piping located above finished floor slab shall be cast iron, hubless pipe with No-Hub fittings. Pipe and fittings shall be in accordance with ASTM A-74 and WW-P-401d.
- D. Drain piping where indicated on drawings shall be hard drawn Type L copper pipe with drainage pattern fittings.
- E. Joints and Connections:
  - 1. Joints for bell and spigot piping shall be caulked with lead and oakum. Each joint shall be firmly packed with oakum or hemp and filled with molten lead not less than 1" deep and extending not more than 1/8" below rim of hub. Contractor may use compression gasket system in lieu of lead caulk specified above. Gasket joints shall be installed in strict accordance with manufacturer's recommendations.
  - 2. Joints for No-hub piping shall be made with No-Hub fittings furnished with neoprene sleeves and band couplings. Standard No-Hub couplings will not be permitted. Couplings shall be medium duty as follows:

Clamp-All Corporation: Clamp-All Hi-Torq 80 coupling  
Anaheim Foundry: Husky "White" SD-2000 coupling  
Mission: Heavyweight "Blue" coupling

Note: Contractor shall use caution in layout and installation of piping systems as required to avoid installation of mechanical couplings partially in walls. This is to avoid problems with installation of thru-wall pipe penetration materials at rated assemblies and to maintain integrity of UL/FM fire safing thruout the project.
  - 3. Joints for copper drain pipe shall be sweat with lead-free hard solder and flux (95-5) for all joints.
  - 4. Failure to comply with specifications will require removal and replacement of all unaccepted joint materials.

### 2.2 CONDENSATE DRAIN PIPING

- A. Run roof and condensate drain piping and provide connections to existing lines approximately where shown on drawings. Coordinate with existing conditions, Plumbing and Architectural

drawings prior to start of construction.

- B. Below Slab/Grade: Drain piping shall be cast iron pipe with bell and spigot fittings. Pipe and fittings shall be in accordance with ASTM A-74 and WW-P-401d.
1. Cast iron pipe and fittings shall be as manufactured by Charlotte Pipe and Foundry or Tyler Pipe and shall bear the collective trademark of the Cast Iron Soil Pipe Institute and listed by NSF International.
- D. Above Slab: Drain piping located above finished floor slab shall be cast iron, hubless pipe with No-Hub fittings. Pipe and fittings shall be in accordance with ASTM A-74 and WW-P-401d.
1. Provide long sweep bends for all vent and drain fittings in lieu of short sweep bends during installation of piping to avoid installing couplings partially imbedded in walls.
- E. Joints and Connections:
1. Joints for No-hub piping shall be made with No-Hub fittings furnished with neoprene sleeves and band couplings. Standard No-Hub couplings will not be permitted. Couplings shall be heavy duty type as follows:  
  
Clamp-All Corporation: Clamp-All Hi-Torq 125 coupling  
Anaheim Foundry: Husky "Orange" SD-4000 coupling  
  
*Note: Contractor shall use caution in layout and installation of piping systems as required to avoid installation of mechanical couplings partially in walls. This is to avoid problems with installation of thru-wall pipe penetration materials at rated assemblies and to maintain integrity of UL/FM fire safing thruout the project.*
  2. Failure to comply with specifications will require removal and replacement of all unaccepted joint materials.

## 2.3 HOT AND COLD WATER PIPING

- A. Run cold water piping and provide connection to exist water piping approximately where shown on drawings. Coordinate with existing conditions, Plumbing and Architectural drawings prior to start of construction.
1. Provide all necessary adaptors and products as required to make final connections to existing water piping.
- B. Above Slab: Water piping located above floor slab shall be hard drawn Type L copper. Use lead-free hard solder (95/5) for all joints located above slab. Use soldering nipples or couplings between screwed and soldered pipe and fittings.
1. Provide galvanized steel pipe nipples with heat traps for electric water heater and install in accordance with manufacturer recommendations. Provide dielectric unions at point of connection to water piping system.
- C. Final connections to equipment shall be by unions. Provide unions at intervals for convenient disassembly of pipe systems. Unions to match material of adjacent pipe.

1. Provide dielectric insulating unions where pipes of dissimilar materials meet and where indicated on drawings.

## 2.4 PIPE INSULATION

- A. All insulation material shall have a fire hazard classification not to exceed flame spread of 25 and smoke developed rating of 50, as listed by Underwriters Laboratories and acceptable under NFPA Standards. This is to apply to the complete system and to the composite insulation with jacket or facings, vapor barrier, joint sealing tapes or coverings, mastic and fittings.
- B. Pipe insulation shall be applied by an insulation contractor whose sole source of income is from the installation of commercial pipe insulating systems. Insulation shall be installed in strict accordance with manufacturer's recommendations.
  1. *Furnish letter from Insulation Contractor with product submittal data at start of project.*
- C. Above ground hot and cold water piping including hot water recirculation piping shall be insulated with 1" thick one piece fiberglass insulation with ASJ embossed vapor barrier laminated jacket.
  1. Provide insulation as specified above for waste/drain piping serving condensate occurring above finished floor slab and where indicated or noted on drawings.
- D. Above ground horizontal roof drain piping shall be insulated with 1" thick one piece fiberglass insulation with ASJ embossed vapor barrier laminated jacket.
  1. Coordinate installation of pipe insulation with galvanized sheet metal insulation shields at clevis hangers to protect insulation from damage. Do not use galvanized shields on insulation exposed to view. Insulation shall conceal hangers at all locations where exposed.
- E. Pipe fittings shall be insulated with same material and thickness as pipe. Insulation shall conform to HH-1-558B, Form D, Type III, Class 12; NFPA 90A and MIL-1-223. Butt and seal all joints using coatings and adhesives as recommended by the insulation manufacturer.
- F. Water and vertical roof and condensate drain piping located in chases and or interior wall spaces may be insulated with 1/2" thick fiberglass, Polymer Foam (EPFI) or flexible unicellular insulation in lieu of the 1" fiberglass specified above. *Flexible unicellular insulation will not be permitted for pipe insulation located in areas above ceilings, in equipment rooms or where exposed.*
  1. Butt and seal all joints using coatings and adhesives as recommended by the insulation manufacturer.
  2. Maintain insulation complete for pipe penetrations through walls and for all drops in walls where concealed and/or located above ceilings.
- G. Insulation exposed in equipment rooms, at domestic water heaters, including areas exposed to view shall be covered with a U.L. labeled, 8 ounce cotton canvas and two coats of Childers CP-52 lagging adhesive. Adhesive shall completely seal cloth ready for painting.
  1. Install PVC jacket for all pipe insulation fittings after completion of insulation.
  2. Remove all excess mastic and materials from valves, products and equipment after installation

to maintain a neat and professional installation.

## 2.5 PIPE SUPPORTS

- A. Perforated strap hangers, chain or wire will not be permitted on the job. All pipe hangers and supports shall be as required to meet Seismic requirements of the IBC International Building Code.
1. *Note: Installation of "Uni-strut" or pipe support channel systems will not be permitted for installation of pipe systems.*
  2. Installation of hangers for all piping shall be suspended from building structures or supplementary steel as specified. Piping secured in corridors to walls with stand-off brackets is not permitted.
- B. Support horizontal piping above ground with hangers, threaded rods and turnbuckles as manufactured by M-CO Michigan Hanger, Anvil, PHD Hangers, Holdrite or accepted equal.
1. ERICO hammer-on rod clips and Z purlin rod clips for 3/8" diameter rods will be accepted for suspended pipe sizes up to 2" in accordance with manufacturer instructions.
- C. Support copper pipe with copper or copper plated teardrop hangers, spaced not over 6 feet apart for pipes smaller than 1-1/2" and 8 feet apart for pipes 1-1/2" and larger.
- D. Support cast iron pipe with steel clevis hangers, spaced not over 5 feet apart for 5 foot sections of pipe and 10 feet apart for 10 foot sections. Locate hangers as near as possible to hubs or band connections.
1. Provide galvanized sheet metal insulation shields at clevis hangers to protect insulation from damage.
- E. Provide concrete inserts for hanging pipe from concrete structures. Inserts shall permit adjustment, removal and use of different size hanger rods.
- F. Provide supplementary steel required for proper support of suspended piping and installation of pipe hangers. All supplementary steel support bracing shall meet seismic design constraints.
1. Seismic systems as manufactured by Amber/Booth or Mason Industries will be accepted.
  2. Provide acceptance letter from the manufacturer's agent prior to project closeout indicating manufacturer review of installed seismic piping restraint systems throughout project.
  3. Provide approved safety restraining devices and products for water heater. Attach products and devices to the adjoining structures in accordance with specific manufacturer installation instructions.

Shop Drawings: Design of supports will require installation shop drawings furnished by the manufacturer which shall include installation methods, sizes and materials signed and sealed by a registered professional engineer in the State of South Carolina. Contractor shall furnish shop drawings for Engineer review at start of project.

## 2.6 PIPE SLEEVES



- A. Core holes where all pipes pass through block wall construction, sized to allow clearance entirely around the passing pipe in accordance with seismic requirements of the International Building Code.
1. Sleeves in bearing walls and floors shall be made of Sch 40 steel or service weight cast iron pipe. Extend vertical sleeves a minimum of 1" above finished floor. Install all pipe sleeves in a waterproof manner.
  2. Sleeves in other walls shall be made of 20 gauge galvanized steel.
- B. See Architectural drawings for locations of fire rated assemblies. Provide pipe sleeves where pipes pass through fire-rated walls or floors. The space between the pipe and the pipe sleeve shall be filled with a UL rated through wall penetration system fire proofing material. Install in accordance with the manufacturer's specific instructions. Installation of fire stopping and sealing of all penetrations is included in this section of these specifications.
1. Failure to comply will require the removal of caulking materials and replacement with UL fire rated materials and sleeves as specified. Submit data sheets for caulking materials for Engineer review. See Architectural drawings for wall ratings and locations.
  2. See detail on drawings for applicable UL penetration assemblies.
  3. Sleeves in bearing walls and floors shall be made of Sch 40 steel or service weight cast iron pipe. *Sleeves may be omitted provided that penetration is completed in accordance with specific manufacturer requirements and installation details for a thru-wall penetration assembly.*
  4. Openings shall not be excessively large and/or irregular for efficient fire stopping details. All firestopping throughout the building shall utilize the same manufacturer's products to ensure compatibility and consistency of penetration seals. Coordinate with the general Contractor and other trades prior to beginning firestopping work.

## 2.7 VALVES

- A. Provide valves of type where indicated. Valves shall be sized according to line sizes.
- B. Gate and check valves shall be Class 125 designed for a minimum of 125 psi steam working pressure. The manufacturer name and the working pressure to be cast on valve body.
- C. Install valves with stems upright within 15 degrees of the vertical plane.
- D. Valve handles shall be malleable iron. Die-cast aluminum handwheels will not be accepted.
- E. Valves to be the product of one of the manufacturers and model numbers shown in the following table:

<u>Gate Valves</u> 3" and smaller (Bronze, Sweat)	<u>MSS Spec.</u> MSS-SP-80	<u>Hammond</u> IB635	<u>Nibco</u> S-111	<u>Milwaukee</u> I49	<u>Stockham</u> B108	<u>Kitz</u> 44
<u>Check Valves</u>	<u>MSS Spec.</u>	<u>Hammond</u>	<u>Nibco</u>	<u>Milwaukee</u>	<u>Stockham</u>	<u>Kitz</u>

2" and smaller (Bronze, Sweat)	MSS-SP-80	IB912	S-413-B	1509	B309Y	23
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F. Provide valves by one manufacturer as specified above.

1. **Imported/economy valves of any type will not be accepted.** Provide valves as specified above and as directed.
2. *Failure to comply will require replacement of any and all valves that are not Engineer reviewed.*

2.8 **IDENTIFICATION OF PLUMBING SYSTEMS**

- A. Provide standard 1-1/4" bronze identification tags as manufactured by Brady Corporation for each valve at electric water heater installation to identify type of service as applicable. Bronze tags shall be attached to the valve by the use of brass s-hooks. Tag identification shall be by service and each valve shall be numbered. Services shall be as follows:

Domestic Cold Water:	CW-1
Domestic Hot Water:	HW-1
Domestic hot Water Recirc:	HW-1

- B. Bronze tags shall be attached to the valve by the use of brass chains and s-hooks.

2. Copper wire or wire ties will not be accepted.
2. Numbering system shall be continuous with numbers clearly identified on identification tags.
3. Failure to comply will require replacement of installed products that do not meet this specification.

- C. Provide valve chart mounted on wall at equipment room to identify valve location and function and locate approximately where indicated on drawings. Valve chart shall be mounted in frame and shall be furnished with clear plexiglass covers. Charts shall be of size as required to clearly identify each valve location and valve function for respective areas of building where located. Example as follows:

<u>Location</u>	<u>Service</u>	<u>Number</u>
Eqpt 139	Cold Water	CW-1
	Hot Water	HW-1

- D. Provide 1/16" thick engraved black plastic nameplates with minimum 1/4" high white letters at each valve location above ceiling. Nameplates shall be secured with chrome plated screws with wall anchors on finished wall below valve location, 2" below suspended ceiling. Nameplates shall be as manufactured by Brady Corporation. Identification on nameplates shall be as follows: "**VALVE**".
- E. Provide identification tape and markers for Domestic Hot and Cold Water Piping including Domestic Hot water recirculation piping at electric water heater. Pipe identification products shall meet ANSI A13.1-1988. Pipe identification products shall be B-689 High Performance pre-coiled pipe markers with self-adhesive ends and flow arrows as manufactured by Brady Corporation.

1. Identification shall be as follows:

**Dom CW**

**Dom HW**

**Dom HWR**

## 2.9 FLOOR DRAIN

- A. Drains shall be as specified below. Install top of recessed strainer flush with finished floor.
  1. PVC plastic drains will not be permitted.
- B. Drain shall be as manufactured by Zurn. Equal drains as manufactured by J.R. Smith, Watts or Josam will be accepted.
- C. Provide deep seal p-traps for floor drain in accordance with IPC 1002.4.
- D. Recessed (FD2): ZN-415-7I-VP with 7" diameter nickel bronze extended rim strainer, 3" outlet. Install drain with top of strainer flush with finished floor. (Verify outlet size with existing conditions prior to ordering drain to prevent conflicts.)
  1. PVC plastic cleanouts will not be permitted inside building.
  2. Contractor shall lubricate/grease all cleanout plugs prior to installation.
- E. Cleanouts:  
Unfinished Areas (CO): Z-1440-BP.

## 2.10 ELECTRIC WATER HEATER

- A. Provide energy-efficient glass lined water heater, ASME construction as manufactured by AO Smith or equal by State Industries. Heater shall be insulated with R-16 foam insulation and have optional 3-year commercial warranty. Provide ASME temperature and pressure relief valve and pipe drain as indicated.  
EWB: DSE-40-6-ASME, Custom Xi Series, 40 gallon storage, 6.0 KW input, triple element.
- B. Water heater shall be furnished with state of the art advanced electronic control. Electronic control feature shall include large LCD display and easy-to-navigate menu with detailed heater status information, temperature setting, diagnostics and economy mode option.
- C. Coordinate electrical characteristics with existing conditions and Electrical Contractor on the job to verify voltage prior to ordering heater. Failure to comply will require replacement of heater furnished with incorrect voltages.
- D. Electric water heater manufacturers shall submit for Prior Approval of equipment 10 days prior to bid date in accordance with specifications.
- E. Provide 3" deep galvanized sheet metal or aluminum drain pan and pipe drain to recessed floor drain as indicated or noted on drawings.

## 2.11 THERMOSTATIC MIXING VALVE

- A. Provide thermostatic mixing valves as indicated on drawings and in accordance with manufacturer's instructions.
  - 1. Provide reducing fittings for final connections to mixing valves as required.
  - 2. See balancing by-pass line required for hot water recirculation system where applicable and install as indicated.
- B. Refer to drawings for locations of mixing valves as follows:

Symmons 7-200A thermostatic mixing valve complete with 3" dial temperature gauge, bronze construction, with swivel action check stops for hot and cold water supply inlets. Locate unit on wall adjacent to water heater as indicated on drawings.

- C. Equal mixing valves as manufactured by Powers, Rada, Lawler or Leonard will be accepted.

Note:

Contractor shall refer to specific manufacture instructions and requirements for the installation of balancing by-pass line for recirculation system installations if specified manufacture is not installed prior to piping up mixing valves and to install piping accordingly. Failure to comply with this requirement for substituted manufacturer from specified product will require repiping in the field as directed.

## 2.12 THERMOMETERS

- A. Thermometers shall be 9" scale, adjustable angle, red reading mercury provided with clear nonbreakable front. Case material shall be nonferrous cast aluminum construction and shall be provided with a brass well.
- B. Range for domestic hot water applications shall be from 30 - 240 degrees F.
- C. Thermometers shall be as manufactured by Trerice, Palmer, Weksler or approved equal.

## 2.13 RECIRCULATION PUMP

- A. Existing recirculation pump shall be reused. Contractor shall use extreme caution in the demolition and modification of the existing water piping to maintain pump and reinstall as shown on drawings.
  - 1. Provide bronze coated stand-off brackets and install on suction and discharge piping at recirculation pump as directed by the engineer.
  - 2. Provide minimum 2"x6" wood blocking in the exiting sheet rock wall for support of the recirc pump, piping, mixing valve and hangers prior to installation of any piping or components at the electric water heater. Coordinate demolition of the existing sheet rock wall with the general contractor.
- B. Provide Honeywell L4006A direct immersion aquastat for pump operation and install where indicated.
- C. Provide Hammond 2002, 3/4" diameter, wheel handle operator, bronze body hosebibb with 3/4" hose thread end and Watts 8A vacuum breaker and locate downstream of recirc pump as detailed

on drawings. Equal hosebibb by Prier, Nibco or Milwaukee will be accepted.

#### 2.14 **EXPANSION TANK**

- A. Provide expansion tank for water heater and install as indicated on drawings.
- B. Expansion tank for electric water heater shall be as manufactured by Amtrol. Equal expansion tank by Wessels, Bell & Gossett or Taco will be accepted.

EWB: Amtrol ST-5, pre-charged at 55 PSI, 2.0 gallon total volume.

#### 2.15 **TRAP GUARD**

- A. Provide ProSet Trap Guard trap primer alternative and locate at floor drain for electric water heater. Guard shall be installed below strainers as directed to minimize potential for dry traps and sewer gas emissions.
- B. Equal trap seals as manufactured by JR Smith or Sure-Seal will be accepted.

#### 2.16 **SUMP PUMP**

- A. Sump pump shall be Weil 1409B as manufactured by. Equal pump manufactured by Zoeller, Goulds or Barnes/Crane pumps will be accepted.
- B. Pump shall be rated at 1/3HP, 1750 RPM, 30 GPM at 20 ft. TDH, 120V, 1 phase.
- C. Furnish pump complete with bronze impeller, ss shaft, strainer and hardware, 8224 level control switch with float on/off switch and green power light, 15 ft. electrical cord with plug.

#### 2.17 **LIFT STATION**

- A. Lift Station shall each be a duplex packaged system as manufactured by Barnes/ Crane Pumps. Pump system shall be selected with manufacturer recommendations and shall be a complete packaged pump station to include the following:
  - Submersible Grinder Pumps
  - Sump Basin
  - Sump Cover
  - Inlet Pipe Connection
  - Sump Level Control Switches
  - Control Panel
- B. Each pump shall be rated at 2 HP, model SGVSP50, 3450 RPM, 30 GPM at 20 ft. TDH, 240 V, 3 phase.
- C. Sump shall be 36" diameter x 48" deep fiber-reinforced polyester basin with ci hub inlet, compression flanged discharge, ballast support flange.
  - 1. Sump basin shall have aluminum 1/4" tread plate cover with fasteners. Sump cover shall include all couplings for electrical and vent conduits including 2" vent cap.

- D. Sump level control switches shall be provided for pump on, pump off and high level alarm.
1. Mercury switch shall be encapsulated in polyurethane foam for corrosion and shock resistance. Level switches shall be weighted to hold position in the basin.
  2. Float switches shall be connected to a stainless steel float bracket and terminate in a NEMA 4X junction box.
- E. Control panel shall be Duplex NEMA 3R, UL listed to include the following:
- Lockable Cover
  - Main disconnect with thru the door operator
  - FVNR starter with circuit breaker
  - Three position selector (HOA)
  - Pump run light
  - Control transformer (fused primary and secondary)
  - Power and control terminals
  - Alarm Bell and Light with Silencing switch
  - Dry Contacts for Alarm Function
  - Automatic Pump Alternator
- F. Lift station manufacturer shall provide factory start-up with written test and balance report to establish all operating conditions and parameters prior to substantial completion.
- G. Equal package pump systems as manufactured by Zoeller, Goulds, Weil or Ebara will be accepted.

### **PART 3 - EXECUTION**

#### **3.1 SEISMIC RESTRAINT**

- A. Provide all necessary materials for installation of seismic restrain system for electric water heater. System components, methods of installation and materials shall be furnished by the seismic system manufacturer and shall be installed in strict accordance with seismic engineer details and instructions.
- B. Seismic supplier shall provide review and certification for installation of seismic components during construction and furnish written report after installation of seismic components are complete. Review and certification letter shall be certified by registered professional engineer and shall be furnished on manufacturer letterhead.

#### **3.2 SOIL, WASTE AND VENT AND CONDENSATE DRAIN PIPE**

- A. Run horizontal pipe, graded uniformly, not less than 1/4" per foot for pipes 3" and smaller and 1/8" per foot for larger pipes. Offset to pass obstructions.
- B. Change size by reducing fittings. Change directions by using 45 degree wyes and long-sweep bends. No pipe to be drilled, tapped or welded. Saddle hubs, tapped tees, and crosses will not be permitted.
- C. Each section of sanitary waste, roof or condensate drain pipe shall be laid to the specified line and grade, working in the upstream direction with the bell end laid upgrade.

### 3.3 STERILIZATION OF HOT AND COLD WATER SYSTEMS

- A. Sterilize with a solution containing not less than (50) parts per million of available chlorine. Use sodium hypochlorite solution conforming to Federal Specifications OB-441-A, Grade D. Solution to remain in system for (24) hours, opening and closing all valves several times. After sterilization, flush with clean water until chlorine is not greater than 0.2 parts per million.
- B. Have samples collected from throughout the systems on (2) consecutive days tested by an approved independent testing laboratory and deliver certificates of approval to County Sanitarian, and Engineer. All laboratory fees shall be included in the plumbing contract. Contractor shall be responsible for preventing use of water from systems for human consumption until tested and approved. Should any of the tests prove unfavorable, the entire disinfection and sampling process shall be repeated.
- C. After the (24) hour retention period of the disinfection solution, the treated water should contain no less than 25 mg/l chlorine throughout the length of pipe.

NOTE: *Certificates indicating negative results of bacteriological tests shall be procured prior to building acceptance.*

### 3.4 TESTS

- A. Pressure and leak test all water piping at minimum 150 psi and in accordance with local codes and ordinances. Blank off equipment and accessories not designed for test pressure.
- B. Pressure test for water lines shall consist of maintaining test pressure of at least 150 psi at the highest point along the test section for at least 4 hours.
- C. Test waste, sanitary drainage, roof or condensate drainage pipe systems affected by these renovations by plugging all necessary openings and filling systems with minimum 10'-0" water column, or as directed for operational testing of pumping systems as directed and in accordance with local codes and ordinances.
- D. Notify local authorities and Engineer prior to backfill of all underground waste or pumped drain lines. Failure to comply shall require lines to be uncovered, retested and inspected.

### 3.5 SUBMITTALS

- A. Submit detailed shop drawings, equipment material cut sheets, and product data for all items as listed below. All product data shall be submitted at one time in detail. Partial submission will not be accepted.
  - 1. Place submittal data in 3-ring binders. Number of submittal data to be submitted for review shall be determined by the Architect.
  - 2. Partial data books submitted for review will be **REJECTED** and will not be reviewed or returned to the contractor. Contractor shall resubmit rejected data in its entirety for review.
- B. Contractor shall order all materials after receipt of reviewed shop drawings, equipment material cut sheets, and product data for Plumbing systems to insure timely delivery to project once materials and equipment have been accepted.

1. Delays in delivery of the aforementioned products for this project will not be tolerated.
2. Substitutions of lesser products than specified will not be accepted due to delays in delivery by the supplier or manufacturer.
3. Failure to comply will require the installation of temporary materials and products as directed by the Engineer to permit completion of the job without delay. These temporary products shall be replaced at the contractors expense once specified materials and products are received.

- Pipe Materials
- Pipe Jointing Materials
- Valves
- Pipe Insulation with Installer Letter
- Fire Caulking Materials
- Pipe Hangers and Supports
- Valve and Pipe Identification
- Floor Drain
- Seismic Bracing for Water heater
- Lift Station and Control Panel
- Sump Pump
- Electric Water Heater
- Thermostatic Mixing Valve
- Thermometers
- Aquastat
- Expansion Tank
- Trap Guards
- Hosebibbs

### 3.6 ENGINEER SITE VISIT REPORTS

- A. Engineer site visit reports will be furnished during construction as requested by the Architect.
- B. Contractor is responsible for correcting all construction items as noted and to respond in writing to all deficiencies as directed. Contractor shall contact Engineer immediately if there are any questions or conflicts after receipt of written site visit reports.
- C. Furnish response to all punchlist items within 10 days of receipt of report indicating completion status to maintain timely, planned construction progress without delays or problems.

### 3.7 FINAL CLOSEOUT PROCEDURES

- A. Contractor shall provide the following items at completion of this project and furnish to the construction manager, Owner or Architect as directed:
  1. Satisfactory water samples. Place in warranty and maintenance manuals.
  2. Minimum (2) copies of completed product submittal data for warranty and maintenance manuals. Provide warranties and maintenance manuals for water heater, lift station and sump pump.



3. Clean and flush debris and dirt from lift station prior to placing in operation.
4. Flush floor and drain. Maintain water flooding of all drains to prevent sewer gas from entering the building after project closeout.
5. Provide Owner operation and training seminar at project closeout. Set up time for meeting and instruct Owner personnel in the proper operation and maintenance of the following:
  - Lift Station and Control Panel
  - Sump Pump
  - Electric Water Heater Controls and Pump Operation

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**END OF SECTION 22 05 00**



## **SECTION 23 00 00 - MECHANICAL, GENERAL**

### **PART 1 - GENERAL**

- 1.1 Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to the work under Division 23 the same as if incorporated herein.
- 1.2 All materials and work shall comply with the 2012 International Mechanical (IMC), 2012 International Plumbing Code (IPC), 2012 Building Codes (IBC), 2009 International Energy Code (IECC), 2010 National Electrical Code (NEC), and National Fire Protection Association (NFPA).
- 1.3 **CONTRACT DOCUMENTS**
  - A. Drawings for work under Division 23 indicate generally the location, arrangement and intent of the systems to be installed. They are diagrammatic and indicate reasonable arrangements.
  - B. It is not the intent of these documents to be used as installation drawings nor to include all related services or accessories to place systems in operation. They are not intended to be coordination documents for detail adaption to building construction, or for coordination with other trades. Installation of equipment shall be in strict accordance with the respective manufacturer's recommended instructions. Obtain certified drawings and installation instructions before starting work.
  - C. After thorough examination of contract documents, bring to attention of Owner prior to bid time any discrepancies, errors or omissions in Division 23. If a conflict exists, the greater quantity or better quality, in the opinion of the Engineer, governs.
  - D. It is the intent of these drawings and specifications to describe complete and working mechanical system(s) and to prescribe for the complete installation and testing of the equipment and devices specified under other sections of the specifications or on the drawings. Work under Division 23 includes all work necessary to make equipment and systems operational while following the details of the drawings and specifications as close as possible. When additional items are required to make systems operational, and are not specifically specified, then items shall be in accordance with the manufacturer's recommendations for the applicable conditions encountered.
  - E. Drawings and specifications are complimentary; work called for in either shall be provided as if called for by both.
- 1.4 Temperature and equipment control wiring are included under Division 23. All power sources, breakers, wiring, conduits, relays, contactors, and any power wiring required for the automatic temperature control system shall be provided by Division 23. All power wiring shall comply with the latest edition of the National Electric Code.
- 1.5 Motor starters and variable frequency drives shall be furnished under Division 23. Mounting and wiring of starters or variable frequency drives including wiring to equipment shall be provided by others. Disconnect switches when required shall be provided under Division 26. Combination starter/disconnect switches shall be furnished under Division 23. Provide all wiring, conduits, breakers, transformers, etc. required to power all control components requiring a power source.

## 1.6 SEISMIC REQUIREMENTS

- A. All HVAC materials shall comply with the 2012 International Building Code with the latest revisions for seismic requirements, see other sections in Division 23.
- B. See other sections in Division 23 for more specific specifications. Generally, the seismic requirements are covered in the sections where they apply (example: Seismic restraints for ductwork are in section 23 31 23 Ductwork).
- C. Provide seismic submittals including calculations to determine restraint loads resulting from seismic forces presented in local building code or 2012 IBC. Seismic calculations shall be certified & stamped by an engineer in the employ of the seismic equipment manufacturer with a minimum 5 years experience and licensed in the project's jurisdiction. Provide calculations for all floor or roof mounted equipment, and all suspended or wall mounted equipment 20lbs or greater.
- D. Calculations and restraint device submittal drawings shall specify anchor bolt type, embedment, concrete compressive strength, minimum spacing between anchors, and minimum distances of anchors from concrete edges. Concrete anchor locations shall not be near edges, stress joints, or an existing fracture. All bolts shall be ASTM A307 or better.
- E. The isolators and seismic restraint systems listed herein are as manufactured by Amber / Booth, Mason Industries, Kinetics, or approved equal. Manufacturer must be a member of the Vibration Isolation and Seismic Control Manufacturers Association (VISCMA).
- F. Steel components shall be cleaned and painted with industrial enamel. All nuts, bolts and washers shall be zinc-electroplated. Structural steel bases shall be thoroughly cleaned of welding slag and primed with zinc-chromate or metal etching primer.
- G. All isolators, bases and seismic restraints exposed to the weather shall utilize cadmium plated, epoxy coat or PVC coated springs and hot dipped galvanized steel components. Nuts, bolts and washers may be zinc-electroplated. Isolators for outdoor mounted equipment shall provide adequate restraint for the greater of either wind loads required by local codes or withstand a minimum of 30 lb. / sq. ft. applied to any exposed surface of the equipment.
- H. Provide shop drawings indicating location of all cable restraints required for pipe and ductwork. Drawings must be stamped by manufacturer's registered professional engineer. Equipment manufacturers shall provide certification that their equipment is capable of resisting expected seismic loads without failure. Equipment manufacturers shall provide suitable attachment points and/or instructions for attaching seismic restraints.
- I. Provide acceptance letter from the manufacturer's agent prior to project closeout indicating manufacturer review of installed seismic piping restraint systems throughout project.

## 1.7 SITE VISIT

All bidders shall visit the site and become familiar with all existing conditions before submitting a bid. Submission of a bid will be considered as evidence that the Contractor has visited the site of work. No extra payments will be allowed the Contractor because of extra work made necessary by his failure to do so.

## 1.8 DEMOLITION ITEMS

The Owner reserves the right to keep any items called for to be removed in the construction documents. Items not kept by the Owner shall be carried away from the site of work. Coordinate with Owner on each item to be removed.

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

- A. All requests for substitutions shall be submitted in writing so as to be received by the Engineer at least ten (10) calendar days prior to bid date and must be granted permission to quote before award of contract.
- B. Requests for substitution shall be submitted in the form of a letter (with one copy minimum) on letterhead of submitting firm. Letter to be addressed to the Engineer and referenced to this job.
- C. Permission to substitute items shall not be construed as authorizing any deviations from the contract documents, unless such deviations are clearly indicated in letter form. Contractor shall be responsible for verifying all dimensions with available space conditions (with provisions for proper access, maintenance, part replacement and for coordination of other trades) for proper services and construction requirements. Contractor to bear any additional costs for required changes in associated items which are directly or indirectly related to a substituted item.

### 2.2 MATERIAL AND EQUIPMENT SUBMITTALS

- A. The Engineer will review and take appropriate action on equipment submittals, product data, samples, and other submittals required by the Contract Documents. Such review shall be only for general compliance with the design and with the information given in the Contract Documents.
- B. Prior to submittal of equipment submittals to the Engineer, review and approve equipment submittals. Equipment submittals which have not been reviewed and approved in writing by the Contractor will not be reviewed by the Engineer.
- C. Submit for review by the Engineer detailed drawings of all equipment and all material listed in this section. All submittal data shall be bound in a hardback binder. Partial submittals will not be reviewed by the Engineer. Furnish six (6) copies of equipment submittals.
- D. Equipment submitted for review shall be detailed, dimensioned drawings or catalog pages showing construction, size, arrangement, operating clearances, performance characteristics and capacities.
- E. Review rendered on equipment submittals shall not be considered as a guarantee of measurements of building conditions. **Where drawings are reviewed, said review does not mean that drawings have been checked in detail; said review does not in any way relieve the contractor from his responsibility or necessity of furnishing materials or performing work as required by the contract documents.**
- F. Submit equipment submittals for the materials and equipment for review by the Engineer:
  - Duct and Pipe Insulation,

- Grilles and Diffusers,
- Seismic submittals,
- Ventilating fans,
- Grilles and Diffusers,
- Split System Heat Pumps,
- Packaged Heat Pumps,
- Ductless Split System Heat Pumps,
- Automatic Temperature Controls.

2.3 Furnish to Architect color chart, etc. as required for him to select finishes for any piece of exposed equipment, grilles and diffusers. Color charts shall be furnished with submittal data. All finishes shall be equivalent to baked enamel unless otherwise indicated.

#### 2.4 **ELECTRICAL CONNECTIONS**

It shall be the sole responsibility of the Mechanical Subcontractor to verify and ensure equipment ordered for this project matches the voltage and phase per existing conditions. No extra payments will be allowed because of the contractor's failure to do so.

### **PART 3 - EXECUTION**

3.1 Deliver to owner a complete, fully operational system. All items to be properly lubricated and operate to their full extent upon completion of the project.

3.2 Deliver to Owner any certificates, permits and licenses as required to comply with all City, County and State applicable laws, ordinances, codes, rules and regulations, including any certificates required by fire department. If any of these items are requested, such items shall be furnished prior to final inspection.

3.3 All work included in this contract shall be performed by skilled people under competent supervision employing the latest and best practices of the various trades involved. All materials and equipment hereinafter specified shall be new and free from flaws and defects of any nature. Work that is not of good quality will require removal and reinstallation.

#### 3.4 **COORDINATION**

- A. No work shall be performed on this project before thoroughly coordinating all space requirements for equipment, sleeves, and pipes. Establish necessary tie-ins for each trade.
- B. Prior to starting installation, furnish to all trades concerned copies of reviewed material and equipment submittals, and location of equipment, sleeves, and pipes.
- C. The responsibility for obtaining, cutting and patching for work under Division 23 is included under this section of the specifications.
- D. Coordinate the exact size and location of all construction openings with the proper trades preparing the openings and be responsible for obtaining sizes as required. Supports for equipment shall be in accordance with the manufacturer's certified drawings.
- E. Temperature and equipment control wiring are included under Division 23.

F. Contractor shall be responsible for the protection and cleanliness of equipment installed under Division 23.

G. See section 23 31 13 Ductwork, paragraph 1.8 SHOP DRAWINGS for additional coordination requirements.

3.5 Notify the Architect/Engineer at least three (3) days in advance prior to covering up or concealing any work under Division 23. Any work covered or concealed without consent or review of the Architect/Engineer shall be exposed for examination at the Contractor's expense.

3.6 Any costs of repairing any damages caused by this contractor, to the building, building contents, and/or site during construction and warranty period shall be included in Division 23.

3.7 Provide all cutting and patching necessary to install the work specified in Division 23. Provide all inserts, sleeves, supports and hanger rods. Lay out work in advance and establish locations of sleeves.

### 3.8 PROJECT CLOSEOUT

A. Provide all initial balancing that season conditions will allow prior to final inspection.

B. For final inspection, all construction filters shall be replaced with new filters. All items shall be cleaned thoroughly inside and outside of all dust, dirt, plaster or other foreign material. Repainting of scratched equipment shall be completed.

C. Notify the Architect, Engineer and or construction manager in writing that he has complied with the above items prior to final inspection. In addition the contractor shall furnish a statement prior to final inspection the following items are complete:

1. All smoke detectors are installed and working properly.
2. Fire suppression systems, extinguishers are installed and working properly, and any other facilities with special requirements.
3. All penetrations (pipes, conduit, ducts, etc.) in rated walls and/or floor/ceiling assemblies are properly installed using appropriate methods and materials.
4. All required seismic bracing of walls, equipment, pipes and ducts is present and properly installed.
5. All HVAC systems have been tested, balanced, and commissioned per ASHRAE 90.1. A copy of the report will be available at the inspection.
6. Listed assembly details, product data sheets, and approved submittals are available on site.

D. A mechanic shall be present at final inspection with all tools and instruments required to completely inspect and check measurements required under "Testing and Balancing." Provide a stepladder and keys for control instruments.

E. Contractor shall indicate in red ink on prints all changes to underground services. Submit print along with other submittals required prior to final inspection.

### 3.9 OWNER INSTRUCTION

A. Instruct the Owner's representative in complete detail as to proper operation of the overall system.

- B. Provide a hard back three-ring file folder containing all warranties, catalog data and the manufacturer's standard operating and maintenance instructions for each item of the controls system.

### 3.10 **WARRANTY**

- A. See General Conditions, and Supplementary Conditions Part I, for Division 23 warranty requirements.
- B. Warrant all work and materials specified under Division 23 for a period of one (1) year from the date of project acceptance. Upon failure of any part(s) of the system during the warranty period, the affected part(s) shall be repaired or replaced promptly by and at the expense of the Contractor.

### 3.11 **IDENTIFICATION**

- A. Identify each piece of equipment and control component. Items shall be identified by name and numerical sequence (AH-1, etc.). Nameplates shall be 1/16" thick plates with 1/2" high white letters on black background. Nameplates shall be attached securely with screws, not glued.
- B. Provide standard bronze identification tags equal to Seton Nameplate Company for each valve to identify type of service as applicable. Bronze tags shall be attached to the valve by the use of brass S-hooks. Tag identification shall be by service and each valve shall be numbered.

### 3.12 **PAINTING**

- A. Provide two coats of black rust preventative on all exposed support metal and hangers mounted in mechanical room.
- B. Paint all new equipment and materials in Division 23 (except factory-painted equipment) exposed to view. Where factory paint has been scratched on new equipment, completely sand, prime and repaint scratched areas. Paint shall be as recommended by equipment manufacturer. Pipes shall be color coded with colors selected by the Engineer. Devco, Sherwin Williams, Pittsburgh, Glidden or approved equal paints may be used.
- C. Paintings, Coatings, and Primers shall not exceed the VOC content limits established in Green Seal Standard GS-11, Paints, First Edition, May 20, 1993.

### 3.13 **UTILITY INTERRUPTIONS:**

Obtain Owner's approval for utility interruptions at least five (5) working days in advance of all scheduled interruptions. Contractor shall arrange work so that interruptions are minimized in number and duration.

### 3.14 **TEMPORARY AIR CONDITIONING**

- A. HVAC sub-contractor shall coordinate with the Contractor the requirements for temporary air conditioning of the building for completion of interior finish work prior to substantial completion.
- B. HVAC sub-contractor shall schedule his work to provide temporary heating and cooling utilizing the new HVAC system at the request of the Contractor. Service, maintenance and filter service of the



equipment shall be provided by the HVAC sub-contractor. The HVAC sub-contractor shall provide temporary duct filters to maintain a clean duct system during temporary service.

- C. The use of the new HVAC system shall not decrease the equipment or installation warranty as specified herein. All equipment and installation warranties shall begin at substantial completion of work.

### 3.15 **ASBESTOS**

- A. At any time the Contractor encounters asbestos containing materials, he shall immediately stop work and suspend any further work until asbestos containing materials are removed by others. Contractor shall, upon discovery of asbestos containing materials, notify Owner or Owner's representative, who shall be responsible for the removal of the asbestos containing materials, all in accordance with NESHAP ( National Emission Standard for Hazardous Air Pollutants.) Any form of asbestos removal or demolition shall be by Owner. Engineer is not an "Owner or Operator" as defined under NESHAP.
- B. Contractor is responsible for, and shall be aware of all state and federal laws pertaining to asbestos as well as NESHAP requirements.

### 3.16 **LEAD PAINT**

At any time the Contractor encounters existing paint containing lead, he shall immediately suspend any further work in the affected area until lead paint is removed by others. Contractor shall, upon discovery of lead paint, notify Owner or Owner's representative, who shall be responsible for the removal of the lead paint.

### 3.17 **RECORD DRAWINGS**

- A. Maintain on the job site one complete set of drawings for this project. All changes authorized by the Owner as to locations, sizes and routing of equipment, ductwork, piping and other material shall be indicated in red ink on the drawings as work progresses.
- B. Before Substantial Completion, Contractor shall submit job site drawings with changes to Engineer. Engineer will incorporate these changes on the Record Drawings, and provide computer generated plots to the Owner including Contractor's name, company name, and date. Contractor shall be responsible for the accuracy of the Record Drawings.

END OF SECTION 23 00 00



## **SECTION 23 05 93 - TESTING AND BALANCING**

### **PART 1 - GENERAL**

- 1.1 Section 23 00 00 Mechanical, General applies to the work specified in this section of specifications.
- 1.2 Work under this section includes the testing, adjusting and balancing of all heating, and air conditioning systems. The results of all tests, adjustments and balancing shall be submitted to the Engineer for approval.
- 1.3 Other sections of the specification are a part of this section. Refer to all other sections for a complete description of the work.
- 1.4 **TESTING AND BALANCING AGENCY**
  - A. All work shall be performed by an independent Test and Balance Agency (T&B Contractor). Testing, adjusting and balancing work shall be the firm's sole source of income. All work shall be under the direct supervision of a project manager who is qualified for testing and balancing the hydronic and air performance of heating, air conditioning, and ventilating systems.
  - B. The testing and balancing contractor will test and balance the systems according to AABC or NEBB standards. The T&B contractor will provide the HVAC sub-contractor with a written list of all project deficiencies and copy the engineer via fax. The T&B contractor will work with the engineer and contractor to insure that any and all deficiencies are adequately addressed prior to submission of the final report. The engineer will be provided with a T&B summary prior to submission of the final report.
  - C. The design engineer may request verification of data at any time during or after the T&B process. The test, balancing and adjusting shall be performed as many times as required to prove project requirements have been met. If requested by the Engineer, tests shall be performed in his presence
  - D. The Testing and Balancing firm will be certified by AABC or NEBB and have a minimum of ten years experience in testing and balancing.
- 1.5 **COORDINATION OF WORK**
  - A. HVAC sub-contractor- The HVAC sub-contractor shall be responsible for installing the systems per the plans and specifications. The HVAC sub-contractor shall also be responsible for coordinating work between the T&B and Control contractor. All system deficiencies will be corrected/optimized prior to the submission of the T&B report. The HVAC sub-contractor shall supply the test and balance contractor with accurate drawings, submittals, and support required to optimize the system(s).
  - B. Control Contractor- The control contractor shall work closely with the T&B contractor during testing and balancing to insure proper operation of the control system. The control contractor will functionally check the controls prior to the T&B process. The T&B process will not begin until the control system has been checked and approved by the control contractor. The control contractor will furnish any software required to test and balance the system(s).

- 1.6 Instruments used shall be of high quality and as recommended by AABC or NEBB for the application. Instruments shall be properly calibrated and certified within the last six months.
- 1.7 The tests, balancing and adjusting shall be performed as many times as required to prove project requirements have been met. If requested by the Engineer, tests shall be performed in his presence.
- 1.8 The balancing firm shall warrant, solely that the system will be set to within 10% of the values as established by the drawings and specifications and also adjust to minimize drafts in all areas.
- 1.9 Any changes that are required for the final balancing results as determined by the balancing firm shall be provided under this section of the specifications. Such changes shall include, but not limited to, changing of pulleys, belts, dampers or adding dampers or access panels.

## **PART 2 - PRODUCTS**

### **2.1 SUBMITTALS**

- A. Prior to acceptance of the systems by the Owner, submit to the Engineer for his review, a written testing, adjusting and balancing report, in triplicate, contained in a hard-backed three ring notebook.
- B. All reports, forms and data sheets shall generally be the standards of AABC or NEBB.

## **PART 3 - EXECUTION**

### **3.1 BALANCING PROCEDURE**

- A. Before starting air balance, check the following items:
  - 1. Air filters to assure cleanliness and position
  - 2. All fans for proper belt tension, alignment and rotation
  - 3. Fan and motor lubrication
- B. Measure supply air volumes by means of the duct traverse method, taking a minimum of 16 readings. Seal duct access holes with snap-in plugs. The use of duct tape to seal access holes will not be allowed.
- C. Adjust balancing dampers for required branch duct air quantities. Dampers shall be permanently marked after air balance is complete.
- D. The total air delivery in any particular fan system shall be obtained by adjustment of the particular fan speed or fan pulley set point. The drive motor of each fan shall not be loaded over the corrected full load amperage rating of the motor involved.

### **3.2 ADJUSTING AND BALANCING**

Adjust, balance, record and submit as previously specified, for each of the following:

- 1. Grilles and Diffusers:

<u>Fan Mark</u>	<u>Room if Applicable</u>	<u>Design CFM</u>	<u>Measured CFM</u>
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2. Air Handling Units and Packaged A/C Units:

- a. Grilles and Diffusers as specified in (1) above
- b. Supply Air Dry Bulb Temperature
- c. Total CFM
- d. Total Static Pressure
- e. Outside Air CFM
- f. External Static Pressure
- g. Nameplate Data
- h. Actual Motor Amperage and Voltage
- i. Fan RPM

3. Exhaust Fans:

- a. Total CFM
- b. Static Pressure
- c. Motor Amperage and Voltage
- d. Fan RPM

**3.3 TESTING OF LOW PRESSURE DUCT**

- A. The low pressure supply air duct systems shall be tested at 1" operating pressure.
- B. The air leakage at the test pressure shall be measured by a calibrated orifice type of flow meter. Total allowable leakage of the system shall not exceed 5% of the fan capacity of the system.
- C. If the system is tested in sections, the leakage rates shall be added to give the performance of the whole system.
- D. The supply duct system shall be tested with spin-in take-offs in place. Provide air bags or other temporary means of capping take-offs during leak test.
- E. Duct systems not passing the leak test shall be sealed and re-tested.
- F. The orifice flow measurement device must have been individually calibrated against a primary standard, and this calibrated curve permanently attached to the orifice tube assembly.
- G. Certificate of leakage compliance shall be submitted by the testing, adjusting and balancing firm to the Engineer for his files.

END OF SECTION 23 05 93



## **SECTION 23 07 00 - MECHANICAL INSULATION**

### **PART 1 - GENERAL**

- 1.1 Section 23 00 00 Mechanical, General applies to the work specified in this section of specifications.
- 1.2 All insulation material shall have a fire hazard classification not to exceed flame spread of 25 and smoke developed rating of 50, as listed by Underwriters Laboratories and acceptable under NFPA standards. This is to apply to the complete system and to the composite insulation with jacket or facings, vapor barrier, joint sealing tapes, mastic and fittings.
- 1.3 All insulation work shall be performed by a franchised insulation firm. The insulation firm shall perform insulation of mechanical systems as its sole source of income. All insulation shall be installed in a workmanlike manner by qualified workers in the regular employ of the insulation firm.

### **PART 2 - PRODUCTS**

#### **2.1 DUCT INSULATION**

Insulation on sheet metal ducts shall be wrapped with 2" thick Owens-Corning "commercial grade" or equal, 1 lb. density, FRK vapor barrier. Minimum R value shall be 6.0 for the 2" thick insulation.

#### **2.2 ACOUSTICAL DUCT LINER**

Acoustical duct liner and internal duct insulation shall be 1" thick Owens-Corning Aeroflex Type 150 or equal by CertainTeed, Manville or equal. The air stream side shall be protected with Permacote to resist erosion and damage. The air stream surface shall also be factory coated with a biocide to resist the growth of mold and mildew.

#### **2.3 MASTIC**

Mastic shall be water-based, non-flammable equal to McGill Uni-Mastic 181. Performance of mastic shall not be affected by room temperatures above 35°F.

#### **2.4 ADHESIVES**

Adhesive for duct liner and duct insulation shall be equal to McGill Uni-Tack, a water-based product for bonding duct liner to metal surfaces.

#### **2.5 PIPE INSULATION:**

Flexible pipe insulation shall be Armstrong FR/Armaflex, or equal. Flexible pipe insulation shall meet flame and smoke rating listed in the "General" paragraph of this section of the specifications. Flexible pipe insulation adhesive shall be an air-drying contact adhesive for temperatures up to 220°F.

### **PART 3 - EXECUTION**

#### **3.1 INSULATION FIRM**

All insulation work shall be performed by a franchised insulation firm. All insulation shall be installed in a workmanlike manner by qualified workers in the regular employ of the insulation firm.

### 3.2 DUCT INSULATION

All concealed sheet metal supply air ducts, return air ducts, and outside air ducts above ceilings shall be insulated with fiberglass duct insulation. All concealed sheet metal exhaust ducts above ceilings to energy recovery units shall be insulated with fiberglass duct insulation. Adhere insulation on ducts to metal with 4" strips of insulation bonding adhesive at 8" centers. Secure insulation on ducts over 24" wide with weld pins and clip washers spaced not more than 15" o.c., to bottom of duct. Staple insulation at all seams with outward clinch staples and vapor sealed with a 3" piece of Glasfab coated completely with a flame retardant mastic. This application also applies at connections to pre-insulated flexible ductwork. **Duct tape will not be allowed.**

### 3.3 ACOUSTICAL DUCT LINER

Provide acoustical duct liner in all sheet metal supply air ducts and return air ducts (in addition to external duct insulation) originating at connection to air handling units and extending a minimum of 15 feet. Provide acoustical duct liner in all exposed ducts in storage rooms. Secure to duct with a heavy coat of quick tacking adhesive spread over entire interior surface of duct. Top and bottom pieces of insulation to lap side pieces and all transverse joints shall be butted together. Further secure insulation to duct with weld pins and clip washers 16" on center at top when width exceeds 15" and on sides when heights exceeds 24". Coat all exposed edges, joints and mechanical fasteners with adhesive.

### 3.4 PIPE INSULATION

Condensate drain pipes and refrigerant suction lines shall be insulated with 1" flexible pipe insulation. Slip insulation on prior to connection and seal all butt joints with adhesive. On tees and ells greater than 45 degrees, insulation shall be mitered and sealed with adhesive. Entire installation shall be in strict accordance with the manufacturer's recommended installation instructions.

END OF SECTION 23 07 00



## **SECTION 23 21 13 - MECHANICAL PIPING**

### **PART 1 - GENERAL**

- 1.1 Section 23 00 00 Mechanical, General applies to the work specified in this section of specifications.
- 1.2 Refrigerant line sizes shall be in strict accordance with equipment manufacturer's published recommendations.
- 1.3 All refrigerant piping shall comply with ASHRAE Standard 15.

### **PART 2 - PRODUCTS**

#### **2.1 REFRIGERANT PIPING**

- A. Refrigerant piping shall be dehydrated, type L ACR copper seamless tubing (ASTM B 280), hard drawn temper with silver solder fittings.
- B. Tubing shall be in straight lengths, 20 feet maximum; refrigerant tubing shipped in coils will not be accepted.

#### **2.2 CONDENSATE DRAIN PIPING** shall be type L copper with sweat fittings.

#### **2.3 PIPE SUPPORTS**

- A. Perforated strap hangers, chain or wire will not be permitted on the job. Support horizontal piping at ceilings with hangers, threaded rods and turnbuckles as mfd. by Grinnell, Fee and Mason, PHD Hangers, or approved equal.
- B. Pipe supports from walls and floors shall be steel pipe stand-off brackets with threaded rods and pipe clamps. Secure to walls or floor slabs as required.
- C. Pipes on roof shall be supported by Miro Industries Model 1.5 Pillow Block Pipestand or approved equal. Pipestand shall support pipes up to 1-1/2" diameter. The pipestand shall consist of (1) a one-piece roof deck base, (2) pipe support, and (3) "U" shaped housing. The pipestand shall be composed of rigid polycarbonate resin with carbon black added for UV resistance and protection. Pipestand design shall absorb thermal expansion and contraction of pipes.

### **PART 3 - EXECUTION**

#### **3.1 REFRIGERANT PIPE**

- A. Dry nitrogen shall be passed through refrigerant piping during the brazing operation in order to minimize oxidation and scale formation.
- B. Refrigerant system shall be triple evacuated drawing a vacuum of 20MM Hg, absolute pressure for first two evacuations, and 2.5 MM Hg (2500 microns Hg), absolute pressure for final evacuation.
- C. Prior to Substantial Completion, furnish to architect two copies of certification from an authorized factory representative certifying the refrigerant system's ability to hold the specified vacuum for a

6 hour period and the operating and safety controls are operating in accordance with manufacturer's recommendations.

**3.2 CONDENSATE DRAIN PIPE**

Provide P-trap at connection to cooling coils. Slope lateral pipes 1/8" per foot in direction of flow.

**3.3 PIPE SUPPORTS**

- A. Support pipe with hangers spaced not over 6 feet apart for 1/2" pipe and 8 feet apart for larger pipes.
- B. Anchor pipe supports to structural members of walls, floors or roof/ceiling securely.

**3.4 EXTERIOR WALL PENETRATIONS**

Where pipes pass through exterior walls, install sleeves sized to allow 1/2" clearance entirely around the passing pipe and insulation. Install sleeves during construction of walls, ceilings, and floors. Install sleeves in a waterproof manner using water proof grout. Sleeves in bearing walls and floors to be made of schedule 40 steel pipe. Sleeves in other masonry or fire rated gypsum board walls to be made of 20 gauge galvanized steel. Provide copper sleeves for copper pipes.

**3.5 FIRE WALL PENETRATIONS**

- A. Where pipes pass through fire-rated walls or floors (see Architectural drawings), the space between the pipe and the pipe sleeve shall be filled with a U.L. 1479 and ASTM E814 test rated fire proofing material. Install in accordance with manufacturer's written installation instructions. On insulated pipes, the insulation shall be omitted inside pipe sleeve except that insulation shall extend into sleeve 1" on both sides of wall, see detail on drawings. Failure to comply will require the removal of caulking materials and replace with materials specified. See Architectural drawings for wall ratings and locations.
- B. Caulking materials shall be U.L. test rated. Caulking by G.E. Pensil Fire Stop Systems, Dow Corning or 3M Products will be accepted.

- 3.6 Provide one-piece chrome plated cast brass escutcheons where pipes pass through finished walls or floors.

END OF SECTION 23 21 13

## **SECTION 23 31 23 - DUCTWORK**

### **PART 1 - GENERAL**

- 1.1 Section 23 00 00 Mechanical, General applies to the work specified in this section of specifications.
- 1.2 All ductwork shall meet job conditions and after coordinating with all trades and existing conditions. Follow duct dimensions indicated on drawings as closely as possible. Provide offsets, vary shape or alter run if required to meet structural or other interferences. Where shape of duct is varied, alter dimensions to provide equal static pressure drop per unit length.
- 1.3 Route ducts to avoid access to air handling units, piping, exhaust fans, and any other HVAC components requiring access for maintenance. Ducts blocking access to components requiring maintenance shall be relocated at no additional expense to the Owner.
- 1.4 Obtain copies of applicable "Sheet Metal and Air Conditioning Contractors National Association, Inc." (SMACNA) Manuals, latest edition, and keep one copy of each on job site.
- 1.5 Ductwork shall be air tight, smooth on inside and neatly finished on outside. Details of support, construction and materials not specified herein to be in accordance with recommendations of SMACNA.
- 1.6 Duct sizes indicated on plans are interior dimensions. Increase metal duct sizes as required for acoustical or interior insulation.
- 1.7 No ductwork shall be fabricated or installed until all space requirements have been thoroughly coordinated with all other trades and existing conditions.
- 1.8 **SHOP DRAWINGS**
  - A. The contractor shall submit detailed coordinated duct shop drawings for all duct systems. Drawings shall be carefully coordinated with plumbing, electrical and structural drawings. Space priorities shall be coordinated and established with each trade to prevent field conflicts and blocking of access to HVAC components requiring maintenance.
  - B. HVAC shop drawings shall show the routing of all water piping, supply, return, exhaust and outside air ductwork closely following the contract drawings and specifications. Drawings shall be detailed to miss any structural elements and work of all other trades.
  - C. Ductwork drawings shall show size, length of each piece, top and bottom elevations and placement of registers and grilles. Fittings shall also show throat length or radius, amount of rise or fall and amount of offset. All riser ducts shall be shown where required. Shaft ducts shall be detailed and fully dimensioned.
  - D. Drawings shall detail exact placement of all HVAC equipment and shall define access and service area required for each piece of equipment. Pad drawings of air handling units if required shall also be included and fully detailed.

#### 1.10 PROTECTION OF DUCT SYSTEMS

- A. Construct ductwork as job progresses and not in advance to prevent damage to ductwork on site. Ductwork shall not be prefabricated more than one week in advance of installation.
- B. Ductwork shall be stored indoors and protected from damage prior to installation. Weathered or damaged ductwork will be rejected and replaced at the contractor's expense.
- C. All supply air, return air, outside air and exhaust ductwork shipped to the job site shall have the ends sealed with plastic to prevent accumulation of dirt and debris. Plastic shall be removed only upon installation of duct. All remaining openings in ductwork shall be fully protected with plastic sealed to duct until connected to equipment, grilles, ductwork, etc. There are no exceptions. Ductwork not protected and installed in this manner will be rejected and replaced at the contractor's expense.
- D. Provide temporary filters to maintain a clean duct system during temporary service. Filters shall cover return grilles and any other openings in ductwork with a minimum MERV-8 filter to protect the duct system from accumulation of organic material. All HVAC equipment utilized to maintain building temperature during construction shall also contain a minimum of MERV-8 filtration.

### PART 2 - PRODUCT

#### 2.1 SHEET METAL DUCT

- A. Sheet metal ducts shall be low pressure sheet metal construction. Sheet metal ducts shall be in accordance with SMACNA Manual "Low Velocity Construction Standards," latest edition. All sheet metal ductwork, unless exposed to view in finished areas, shall be galvanized.
- B. All sheet metal supply air, return air, outside air, and exhaust ducts shall be 26 gauge minimum.

#### 2.2 FLEXIBLE DUCT

Fiberglass flexible round duct shall be a minimum of 1" thick Owens-Corning or equal by Genflex or Thermaflex. The product shall bear a U.L. 181 Class 1 Air Duct label. Each section shall have locking sheet metal end rings designed to connect to duct take-off fittings, terminal units and rigid round ducts. Maximum run of flexible duct shall be 6 feet.

#### 2.3 EXPOSED DUCTWORK

Ductwork exposed in finished areas shall be paint gripping type sheet metal, 24 guage.

### PART 3 - EXECUTION

#### 3.1 DUCT CONSTRUCTION

Supply air, return air, outside air, and exhaust ducts shall be low pressure galvanized sheet metal ducts, 26 gauge minimum.

- 3.2 All turns in low pressure ducts greater than 45° shall be made with turning vanes. Turning vanes shall be single vane type installed on runners.

**3.3 FLEXIBLE DUCT:**

Each section of flexible round duct shall have locking worm clamps designed to connect to duct take-off fittings and terminal units. **Maximum run of flexible duct shall be 6 feet.** Provide rigid round runouts beyond 6 feet.

**3.4 EXPOSED DUCTWORK**

Where ductwork is exposed to view in finished areas, provide materials which are free from visual imperfections including pitting, seam marks, roller marks, stains, discolorations, and other imperfections including those which would impair painting. Refer to Architectural drawings and provide exposed ductwork where shown in spaces without ceilings (ex: storage rooms).

**3.5 SUPPORTS**

- A. Support horizontal ducts with 1" wide galvanized sheet metal hanger straps spaced not more than eight (8) feet apart, at every transverse joint and at changes in direction.
- B. Support flexible ducts with galvanized sheet metal hanger straps spaced not more than three (3) feet apart, at every change in direction. Crimping or sagging of flexible ductwork will not be accepted.
- C. Construct, brace, and support ducts in manner that they will not sag nor vibrate when fans are operating at minimum speed and capacity.

3.6 Duct sizes indicated on plans are interior dimensions. Increase metal duct sizes as required for acoustical or interior insulation.

3.7 Duct sizes and routing shall be altered to avoid piping, structural members and any other interferences. Determine interferences before fabricating ductwork. Changes in duct sizes shall be equal in pressure drop to that specified.

3.8 Provide 1" diameter test slots with cover for insertion of thermostat or test instruments at all locations required to perform operations required under Section 23 05 93.

3.9 Protect all fan and duct openings from dirt and rubbish during construction. Clean system to be delivered to owner.

3.10 All interior portions of ductwork visible through grilles or diffusers shall be painted with flat black paint.

**3.11 FLEXIBLE DUCT CONNECTORS**

Provide flexible duct connectors at supply air, return air, outside air, and exhaust connections to air handling units that do not have internal flexible duct connectors and internal supply fan vibration isolation.

**3.12 SEISMIC RESTRAINT FOR DUCTWORK**

- A. Seismically restrain all rectangular ducts with cross sectional areas of 6 square feet and larger. All ductwork installations shall have seismic restraint protection per "Seismic Restraint Manual - Guidelines for Mechanical Systems Second Edition - February, 1998."
- B. Seismic cable restraints shall consist of steel cables sized to resist seismic loads with a minimum safety factor of two and arranged to provide all-directional restraint. Seismic loads shall comply with the 2012 International Building Code.
- C. No restraints are required if the duct is suspended by hangers 12" or less in length, as measured from the top of the duct to the bottom of the support where the hanger is attached. Hangers must be positively attached to the duct within 2" of the top of the duct with a minimum of two #10 sheet metal screws.
- D. Transverse restraints shall occur at 30' intervals or at both ends if the duct run is less than the specified interval. Transverse restraints shall be installed at each duct turn and at each end of a duct.
- E. Longitudinal restraints shall occur at 60' intervals with at least one restraint per duct run. Transverse restraints for one duct section may also act as longitudinal restraints for a duct section connected perpendicular to it if the restraints are installed within four feet of the intersection of the ducts and if the restraints are sized for the larger duct. Duct joints shall conform to SMACNA duct construction standards.
- F. Walls, including gypsum board nonbearing partitions, which have ducts running through them may replace a typical transverse brace. Provide solid blocking around duct penetrations at stud wall construction.
- G. Unbraced ducts shall be installed with 6" minimum clearance to vertical ceiling hanger wires.

END OF SECTION 23 31 23

## **SECTION 23 34 23 - FANS AND AIR DISTRIBUTION**

### **PART 1 - GENERAL**

1.1 Section 23 00 00 Mechanical, General applies to the work specified in this section of specifications.

#### **1.2 FANS**

- A. Each fan shall bear the AMCA seal for rated sound and air.
- B. Noise level indicated is maximum level in sones for fans and curb combination at 5'-0" distance in accordance with AMCA Standards 210 and 300.

#### **1.3 GRILLES AND DIFFUSERS**

- A. Sizes indicated on drawings are general and are based on the first listed manufacturer. Final selection to be used on equipment to be installed with sizing in accordance with manufacturer's recommendations and above limitations. Coordinate ductwork sizes with final diffuser selections.
- B. Ceiling grilles and diffusers shall be of type frame and design to best match the ceiling construction in which installed. Use type shown on drawings as a guide. Verify ceiling type from architectural drawings.

#### **1.4 FIRE DAMPERS and COMBINATION FIRE/SMOKE DAMPERS**

Fire dampers and fire/smoke dampers shall be constructed and tested in accordance with U.L Safety Standard 555. Fire dampers and fire/smoke dampers shall bear the U.L. label.

### **PART 2 - PRODUCTS**

#### **2.1 FANS**

- A. Fans shall be Greenheck, Cook, Twin City Fan, Carnes, or approved equal.
- B. In-line fans (ILF's) shall be belt driven. The square shaped fan housing shall be constructed of galvanized steel. One of the sides shall be hinged, shall support the motor and sheave assembly allowing the assembly to swing out for cleaning, inspection or service without dismantling the unit in any way. The motor shall be isolated from the air stream and shall draw cooling air from outside the fan housing. Belt drive units shall have the belt and pillow block ball bearings protected from the air stream by an enclosure. The shaft shall be keyed to both the wheel and pulley. The fan inlet shall be a spun venturi throat overlapped by a backward curved centrifugal wheel with spun cone for maximum performance.
- C. Ceiling exhaust fans (CEF's) to be furnished complete with insulated housing backdraft damper and aluminum grille. The fan housing shall be constructed of phosphatized steel with oven baked enamel finish. The housing interior shall be acoustically lined throughout with 1/2" thick insulation. Fans shall have baked enamel intake grille and discharge duct connections. Provide exhaust fans with discharges (as noted on drawings), power disconnect, backdraft damper, insect screen, and variable speed controller.

- D. Roof exhaust fans (REF's) shall be spun aluminum, roof mounted, belt driven, downblast centrifugal exhaust ventilator. The fan shall be of bolted and welded construction utilizing corrosion resistant fasteners. The spun aluminum structural components shall be constructed of minimum 16 gauge marine alloy aluminum, bolted to a rigid aluminum support structure. The aluminum base shall have continuously welded curb cap corners for maximum leak protection. The discharge baffle shall have a rolled bead for added strength. An integral conduit chase shall be provided through the curb cap and into the motor compartment to facilitate wiring connections. The motor shall be enclosed in a weather-tight compartment, separated from the exhaust airstream. Unit shall bear an engraved aluminum nameplate. Nameplate shall indicate design CFM and static pressure. Unit shall be shipped in ISTA certified transit tested packaging. Wheel shall be centrifugal backward inclined, constructed of 100% aluminum, including a precision machined cast aluminum hub. An aerodynamic aluminum inlet cone shall be provided for maximum performance and efficiency. Wheel shall be balanced in accordance with AMCA Standard 204-96, Balance Quality and Vibration Levels for Fans. Motor shall be heavy duty type with permanently lubricated sealed bearings and furnished at the specified voltage, phase and enclosure.

## 2.2 GRILLES AND DIFFUSERS

- A. Unless otherwise indicated, color and finish to be as selected by Architect.
- B. Maximum noise level on any unit shall be at least 5 less than noise criteria level (NC) for which room is designed unless otherwise indicated. Room NC to be assumed to be 35 unless known. Maximum pressure drop shall not exceed 0.1" w.g. unless otherwise noted.
- C. Grilles and diffusers shall be Price model numbers listed in schedule on drawings or equal by Titus, Krueger, Carnes or approved equal.
- D. Ceiling supply diffusers and return grilles shall be furnished with seismic clips for connection of seismic cables.

## 2.3 FIRE DAMPERS (FD's)

- A. Fire dampers shall be provided with 212F fusible link.
- B. Fire dampers shall be Ruskin model IBD2, type "B" except fire dampers required behind wall mounted grilles or diffusers shall be type "A".
- C. Fire dampers penetrating floors and walls rated up to 2 hours shall be U.L. rated for 1-1/2 hours. Fire dampers penetrating floors and walls rated more than 2 hours shall be U.L. rated for 3 hours.
- D. Fire dampers mounted in ceiling grilles and diffusers shall be Ruskin CFD-5A ceiling fire dampers with grille and diffuser radiation shields. Ceiling fire dampers shall be UL Fire Resistance Classified. The fire damper located in the neck of the grille or diffuser shall be a fusible volume adjustment. The fire damper shall be furnished with a factory fabricated ceiling diffuser radiation shield. The entire system shall be UL Classified for use in all UL fire rated roof/ceiling systems with fire resistance ratings of three hours or less.
- E. Equal fire dampers by Air Balance, Inc. or Safe Air, Inc., Prefco and American Warming will be accepted.



**2.4 COMBINATION FIRE/SMOKE DAMPERS (FSD's)**

- A. Frame shall be 5"x1"x16 gauge galvanized hat-shaped steel channel.
- B. Blades shall be 6" wide, airfoil shaped. Blades shall be parallel acting.
- C. Sleeve shall be 20" x 20 gauge galvanized steel with 3/4" flange on one end and factory installed thermal insulation on three sides. Sleeve length shall be based on minimum 4" wall; add 1" to sleeve length for every 1" of additional wall depth.
- C. Linkage shall be concealed in frame.
- D. Axles shall be 1/2" plated steel hex.
- E. Bearings shall be stainless steel, pressed into frame.
- F. Blade edge seals shall be silicone rubber. Jamb seal shall be stainless steel, flexible metal compression type.
- G. Finish shall be mill.
- H. See Division 26 Electrical for smoke detectors.
- I. Combination fire/smoke dampers shall be provided with a 212°F controlled closure device.

**2.5 CONTROL DAMPERS**

- A. Dampers to Ruskin model CD-60, airfoil blade, low leakage or Air Balance, Inc. model AC-516 or equal by Dowco AWM or approved equal.
- B. Damper frame and blades shall be 16 gauge galvanized steel. Bearings shall be molded synthetic. Finish shall be mill galvanized. Leakage on a 24" wide damper shall not exceed 5.8 CFM per square foot.

**2.6 BALANCING DAMPERS**

- A. Manual balancing dampers shall be Ruskin model MD-35 or equal by Air Balance, Prefco, American Warming, Safe Air or approved equal.
- B. Dampers shall be opposed blade, positive lock, non stick, non corrosive, internally braced constructed of steel. Provide damper with 3/8" square steel control shaft without operator.

**2.7 TAKE-OFFS**

Take-offs from low pressure fiberglass duct trunks to diffusers shall be a factory-manufactured spin-in type fitting with air-scoop and manual balancing damper.

**2.8 DUCT ACCESS DOORS**

Access door shall be SMACNA Standard and shall be constructed of 22 gage galvanized steel. The doors shall be hinged double skin insulated door with thumb latch and foam gasketed seal. The doors shall be located so devices may be conveniently inspected, tested and reset. Access doors shall be Ruskin model ADH or approved equal.

**2.9 ACCESS PANELS**

Provide heavy duty 16 gage type 304 stainless steel finish, concealed hinge, access panel with flush mounted keyed locking device as manufactured by Karp, Elmdoor or Bilco. Provide doors to permit access and/or removal of dampers, operators, etc. Minimum sized shall be 12"x12". Coordinate location of panels with all trades prior to installation. Panels shall be suitable for installation flush with finished ceiling and wall surfaces. See architectural drawings for type required.

**PART 3 - EXECUTION**

**3.1 FANS AND ROOF VENTS**

- A. Install each fan and roof vent in accordance with manufacturer's written installation instructions.
- B. Remove existing roof curbs for roof mounted fans. Attach new pre-fabricated roof curbs for roof fans and vents to roof deck in accordance with the seismic requirements of the 2012 International Building Code.
- C. Provide hold downs for each roof fan and vent for a seismic connection of vent to curb in accordance with the seismic requirements of the 2012 International Building Code.
- D. Installation of roof curbs for roof exhaust fans is not included in Division 23.
- E. Suspend ceiling and inline exhaust fans from roof structure with threaded rods and vibration isolators. Provide seismic sway cables at each support point and connect to building structure in accordance with 2012 International Building Code.

**3.2 FIRE DAMPERS and COMBINATION FIRE/SMOKE DAMPERS**

- A. Fire dampers and fire/smoke dampers shall be installed in wall openings or floor openings utilizing steel sleeves, angles and other materials and practices required to provide an installation equivalent to that utilized by the manufacturer when dampers were tested at U.L. Installation shall be in accordance with damper manufacturer's written installation instructions.
- B. Fire damper shall be sized so that the free area is not less than the connected duct free air space.
- C. See HVAC Automatic Fan Shutdown Diagram on drawings.
- C. Refer to Architectural drawings and provide fire dampers in ducts penetrating rated walls or ceilings.

**3.3 GRILLES AND DIFFUSERS**

- A. For air balancing purposes, provide a opposed blade balancing damper with key operator for all grilles and diffusers.
- B. Install grilles and diffusers in accordance with manufacturer's recommendations and installation instructions. Mount all units securely to ducts and/or building construction in an approved manner.
- C. Ceiling units to be arranged to make uniform pattern with lighting fixtures. See architect's reflected ceiling plan.
- D. Provide seismic sway cables at each ceiling grille or diffuser seismic clip and connect to building structure in accordance with the seismic requirements of the 2006 International Building Code.

**3.4 LOUVERS**

Installation of louvers is not included in Division 23.

**3.5 ACCESS PANELS**

Furnish access panels where required for access to balancing and control components located in inaccessible ceilings and walls. Coordinate with all trades. Coordinate with General Contractor to install access panels.

END OF SECTION 23 34 23



## **SECTION 23 81 26 - DUCTLESS SPLIT SYSTEM HEAT PUMPS**

### **PART 1 - GENERAL**

1.1 Section 23 00 00 Mechanical, General applies to the work specified in this section of specifications.

#### **1.2 SYSTEM DESCRIPTION:**

- A. The split system heat pump shall be a Daikin as scheduled on the drawings or equal by Carrier, Mitsubishi, LG or approved equal.
- B. Each indoor unit or group of indoor units shall be independently controlled.
- C. Indoor and outdoor sections of the systems shall be by the same manufacturer.

#### **1.3 QUALITY ASSURANCE**

- A. The units shall be tested by a Nationally Recognized Testing Laboratory (NRTL), in accordance with ANSI/UL 1995 - Heating and Cooling Equipment and bear the Listed Mark.
- B. All wiring shall be in accordance with the National Electrical Code (N.E.C.).
- C. The units shall be manufactured in a facility registered to ISO 9001 and ISO14001 which is a set of standards applying to environmental protection set by the International Standard Organization (ISO).
- D. A full charge of R-410A for the condensing unit only shall be provided in the outdoor section of the heat pump.

#### **1.4 DELIVERY, STORAGE AND HANDLING**

Unit shall be stored and handled according to the manufacturer's recommendations.

1.5 **WARRANTY:** The units shall be covered by the manufacturer's limited warranty for a period of one (1) year from date of installation, or a maximum of eighteen (18) months from the date of shipment. In addition the compressor shall have a manufacturer's limited warranty for a period of six (6) years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer. This warranty shall not include labor.

1.6 The system shall be installed by a factory trained mechanical contractor. The mandatory contractor service and install training should be performed by the manufacturer.

1.7 The split system heat pump shall perform as scheduled on the drawings.

#### **1.8 EQUIPMENT RAILS AND PIPE PENTHOUSES**

Contractor to provide all equipment submittals to equipment supplier for proper selection of equipment rails and pipe penthouses. Equipment rails and pipe penthouses shall be manufactured by Imperial Metals or Roof Product System or approved equal.

## **PART 2 - PRODUCTS**

### **2.1 OUTDOOR UNIT:**

#### **A. GENERAL:**

1. The outdoor unit shall be factory assembled and pre-wired with all necessary electronic and refrigerant controls. The refrigeration circuit of the condensing unit shall consist of scroll compressors, motors, fans, condenser coil, electronic expansion valves, solenoid valves, 4-way valve, distribution headers, capillaries, filters, shut off valves, oil separators, service ports and refrigerant regulator. High/low pressure gas line, liquid and suction lines shall be individually insulated between the outdoor and indoor units.
2. The outdoor unit can be wired and piped with outdoor unit access from the left, right, rear or bottom.
3. The connection ratio of indoor units to outdoor unit shall be permitted up to 200%.
4. The system shall automatically restart operation after a power failure and shall not cause any settings to be lost, thus eliminating the need for reprogramming.
5. The unit shall incorporate an auto-charging feature and a refrigerant charge check function.
6. The outdoor unit shall be modular in design and should allow for side-by-side installation with minimum spacing.
7. The following safety devices shall be included on the condensing unit; high pressure switch, control circuit fuses, crankcase heaters, fusible plug, high pressure switch, overload relay, inverter overload protector, thermal protectors for compressor and fan motors, over current protection for the inverter and anti-recycling timers.
8. Oil recovery cycle shall be automatic occurring 2 hours after start of operation and then every 8 hours of operation.
9. The outdoor unit shall be capable of heating operation at 0°F dry bulb ambient temperature without additional low ambient controls.
10. The system shall continue to provide heat to the indoor units in heating operation while in the defrost mode.

#### **B. UNIT CABINET:**

The outdoor unit shall be completely weatherproof and corrosion resistant. The unit shall be constructed from rust-proofed mild steel panels coated with a baked enamel finish.

#### **C. FAN:**

The condensing unit shall consist of one or more propeller type, direct-drive 350 and 750 W fan motors that have multiple speed operation via a DC (digitally commutating) inverter. The condensing unit fan motor shall have multiple speed operation of the DC (digitally commutating) inverter type, and be of high external static pressure and shall be factory set as standard at 0.12 in. WG. A field setting switch to a maximum 0.32 in. WG pressure is available to accommodate field applied duct for indoor mounting of condensing units. The fan shall be a vertical discharge configuration with a nominal airflow maximum range of 6,700 CFM to 14,120 CFM dependant on model specified. The fan motor shall have inherent protection and permanently lubricated bearings and be mounted. The fan motor shall be provided with a fan guard to prevent contact with moving parts.

**D. COIL:**

The condenser coil shall be manufactured from copper tubes expanded into aluminum fins to form a mechanical bond. The heat exchanger coil shall be of a waffle louver fin and rifled bore tube design to ensure high efficiency performance. The heat exchanger on the condensing units shall be manufactured from Hi-X seamless copper tube with N-shape internal grooves mechanically bonded on to aluminum fins to an e-Pass Design. The fins are to be covered with an anti-corrosion acrylic resin and hydrophilic film type E1. The pipe plates shall be treated with powdered polyester resin for corrosion prevention. The thickness of the coating must be between 2.0 to 3.0 microns.

**E. COMPRESSOR:**

1. The inverter scroll compressors shall be variable speed (PAM inverter) controlled which is capable of changing the speed to follow the variations in total cooling and heating load as determined by the suction gas pressure as measured in the condensing unit. In addition, samplings of evaporator and condenser temperatures shall be made so that the high/low pressures detected are read every 20 seconds and calculated. With each reading, the compressor capacity (INV frequency or STD ON/OFF) shall be controlled to eliminate deviation from target value.
2. The inverter driven compressor in each condensing unit shall be of highly efficient reluctance DC (digitally commutating), hermetically sealed scroll "G-type" with a maximum speed of 7,980 rpm.
3. Neodymium magnets shall be adopted in the rotor construction to yield a higher torque and efficiency in the compressor instead of the normal ferrite magnet type. At complete stop of the compressor, the neodymium magnets will position the rotor into the optimum position for a low torque start.
4. The capacity control range shall be as low as 6% to 100%.
5. Each non-inverter compressor shall also be of the hermetically sealed scroll type.
6. Each compressor shall be equipped with a crankcase heater, high pressure safety switch, and internal thermal overload protector.
7. Oil separators shall be standard with the equipment together with an intelligent oil management system.
8. The compressor shall be spring mounted to avoid the transmission of vibration.
9. Units sized 8-12 ton shall contain a minimum of 2 compressors, 14-16 ton units shall contain a minimum of 3 compressors and 18-20 ton shall contain a minimum of 4 compressors. In the event of compressor failure the remaining compressors shall continue to operate and provide heating or cooling as required at a proportionally reduced capacity. The microprocessor and associated controls shall be designed to specifically address this condition.
10. In the case of multiple condenser modules, conjoined operation hours of the compressors shall be balanced by means of the Duty Cycling Function, ensuring sequential starting of each module at each start/stop cycle, completion of oil return, completion of defrost or every 8 hours.

**G. ELECTRICAL:**

The control voltage between the indoor and outdoor unit shall be 16VDC non-shielded, stranded 2 conductor cable. The control wiring shall be a two-wire multiplex transmission system, making it possible to connect multiple indoor units to one outdoor unit with one 2-cable wire, thus simplifying the wiring operation.

## 2.2 INDOOR UNITS

- A. Each system shall perform in accordance to the ratings shown in the schedule on the drawings. Performance shall be based on nominal cooling conditions of 80°FDB, 67°FWB for the indoor unit and 95°FDB for the outdoor unit and nominal heating conditions of 70°FDB for the indoor unit and 47°FDB for the outdoor unit.
- B. The indoor units shall be completely factory assembled and tested. Units shall be factory wired and piped, and shall have electronic proportional expansion valve, control circuit board, fan motor thermal protector, flare connections, condensate drain pan, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch. Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory. Both refrigerant lines shall be insulated from the outdoor unit. The indoor units shall be equipped with a return air thermistor.
- C. Computerized PID control shall be used to control superheat to deliver a comfortable room temperature condition. The unit shall be equipped with a programmed drying mechanism that dehumidifies while inhibiting changes in room temperature.

### D. CONCEALED CEILING DUCTED UNITS:

- 1. General: Daikin indoor unit FXMQ or equal by Sanyo or approved equal shall be a built-in ceiling concealed fan coil unit, operable with refrigerant R-410A, equipped with an electronic expansion valve, for installation into the ceiling cavity. It shall be constructed of a galvanized steel casing. It shall be a horizontal discharge air with horizontal return air configuration. Units shall be a low height (15-3/8") cabinet. The indoor units sound pressure shall range from 41 dB(A) to 45 dB(A) at low speed measured 5 feet below the ducted unit.
- 2. The unit shall have an external adjustable static pressure switch.
- 3. The cabinet shall be constructed with sound absorbing foamed polystyrene and polyethylene insulation.
- 4. The fan shall be direct-drive Sirocco type fan with statically and dynamically balanced impeller with high and low fans speeds available. Air flow rate shall be available in high and low settings. The fan motor shall be thermally protected. Fans shall be capable of external static pressures as scheduled on drawings.
- 5. Coils shall be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond. The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance. The coil shall be a 3 row cross fin copper evaporator coil with 13 fpi design completely factory tested. The refrigerant connections shall be flare connections and the condensate will be 1-1/4 inch outside diameter PVC.

### E. WALL MOUNTED UNITS:

- 1. General: Daikin indoor unit FXAQ or equal by Sanyo or approved equal shall be a wall mounted fan coil unit, operable with refrigerant R-410A, equipped with an electronic expansion valve, for installation onto a wall within a conditioned space. A mildew-proof, polystyrene air filter and condensate drain pan shall be included as standard equipment. The indoor units sound pressure shall range from 32 dB(A) to 35 dB(A) at low speed measured at 3.3 feet below and from the unit.
- 2. The unit shall have an auto-swing louver which ensures efficient air distribution, which closes automatically when the unit stops. The remote controller shall be able to set five (5) steps of



discharge angle. The front grille shall be easily removed for washing. The discharge angle shall automatically set at the same angle as the previous operation upon restart. The drain pipe shall be able to be fitted to from either left or right sides.

3. The cabinet shall be affixed to a factory supplied wall mounting template and located in the conditioned space. The cabinet shall be constructed with sound absorbing foamed polystyrene and polyethylene insulation.
4. The fan shall be direct-drive cross-flow fan with statically and dynamically balanced impeller with high and low fans speeds available. Air flow rate shall be available in high and low settings. The fan motor shall be thermally protected.
5. Coils shall be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond. The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance. The coil shall be a 2-row cross fin copper evaporator coil with 14 fpi design completely factory tested. The refrigerant connections shall be flare connections and the condensate will be 11/16 inch outside diameter PVC. A thermistor will be located on the liquid and gas line. A condensate pan shall be located in the unit.
6. A condensate pump with a 15 foot lift shall be located below the coil in the condensate pan with a built in safety alarm. Condensate pump shall be factory installed, high capacity.

**F. 4-WAY CEILING CASSETTE UNITS:**

1. General: Daikin indoor unit model FXFQ or equal by Sanyo or approved equal shall be a ceiling cassette fan coil unit, operable with R-410A refrigerant, equipped with an electronic expansion valve, for installation into the ceiling cavity equipped with an air panel grill. It shall be a four-way air distribution type, ivory white, impact resistant with a washable decoration panel. The supply air is distributed via motorized louvers which can be horizontally and vertically adjusted from 0° to 90°. The indoor units sound pressure shall range from 28 dB(A) to 33 dB(A) at low speed measured at 5 feet below the unit.
2. A condensate pump with a 21 inch lift shall be located below the coil in the condensate pan with a built in safety alarm.
3. The 4-way supply air flow shall be able to be field modified to 3-way and 2-way airflow to accommodate various installation configurations including corner installations. Return air shall be through the concentric panel, which includes a resin net mold resistant filter.
4. Units shall be capable of fresh air intake.
5. The cabinet shall be constructed with sound absorbing foamed polystyrene and polyethylene insulation.
6. The fan shall be direct-drive turbo fan type with statically and dynamically balanced impeller with high and low fans speeds available. Air flow rate shall be available in high and low settings. The fan motor shall be thermally protected.
7. The return filter shall be filtered means of a washable long-life filter with mildew proof resin.
8. Coils shall be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond. The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance. The coil shall be a 2-row cross fin copper evaporator coil with 17 FPI design completely factory tested. The refrigerant connections shall be flare connections and the condensate will be 1 -1/4 inch outside diameter PVC. A condensate pan shall be located under the coil. A thermistor will be located on the liquid and gas line.

**2.4 CONTROLS:**

- A. The controls shall be capable of supporting remote controllers, schedule timers, system controllers, centralized controllers, and system integration to the Building Management System (see specification section 25 55 00 - Automatic Temperature Controls).
- B. Physical Characteristics: The control system shall be a neutral color plastic material. Each control may have a Liquid Crystal Display (LCD).
- C. Electrical Characteristics: From each circuit board to the controls, the electrical voltage shall be 16 volts DC. Control wiring shall run from the indoor unit terminal block to the specific controller for that unit. The wire shall be a non-shielded, 2-core sheathed vinyl cord or cable, size AWG18-2.

**D. INDIVIDUAL ZONE CONTROLLER**

- 1. The wired navigation controller shall be provided for each system (do not daisy-chain systems), and shall be able to function as follows:
  - a. The controller shall have a maximum wiring length of 1,640 feet.
  - b. The controller shall have a self diagnosis function that constantly monitors the system for malfunctions (total of 80 components).
  - c. The controller shall be able to immediately display fault location and condition.
  - d. An LCD digital display will allow the temperature to be set in 1°F units.
  - e. The controller shall be equipped with a thermostat sensor in the controller making possible more comfortable room temperature control.
  - f. The controller shall monitor room temperature and preset temperature by microcomputer and can select cool/heat operation mode automatically.
  - g. The controller shall allow the user to select cool / heat / fan operation mode with indoor remote controller of choice without using the cool / heat selector.
- 2. The wired navigation controller shall have the following features:
  - a. Operation: Start/stop, operation mode, temperature setting, 60°F-90°F set point range, fan speed, and airflow direction.
  - b. Monitoring: Status, malfunction flashing, malfunction content, filter sign, operation mode, temperature setting, permit/prohibit selection, fan speed, airflow direction.
  - c. Scheduling: Occupied/Unoccupied with timed override and temporary temperature override.
  - d. Control Management: Field setting mode, group setting, auto-restart.

**2.5 EQUIPMENT RAILS**

- A. Roof mounted equipment rails shall be RPS model ER-4A.
- B. The rails shall be 18 gauge galvanized steel, monolithic construction, with integral base plate, continuous welded corner seams, factory installed 2 x 4 nailer and including and 18 gauge galvanized steel counter-flashing complete with screws.

**2.6 See Pipe Penthouse detail on drawings.**

### **PART 3 - EXECUTION**

- 3.1 Suspend concealed ceiling ducted indoor units and ceiling mounted cassette units from threaded rods from floor or roof support structure as recommended the unit manufacturer. Provide spring vibration isolators at each hanger rod. Mount unit level by checking casing. Provide seismic sway cables at each unit support and connect to floor or roof structure, leaving the allowable slack in the cable, per 2012 International Building Code.
- 3.2 Mount wall mounted units to the building wall structure per manufacturer's printed installation instructions, and support for seismic protection per the 2012 International Building Code.
- 3.3 Connect condensate drain and secondary drain connection to fan coil unit and pipe to condensate main as shown on drawings.
- 3.4 After construction is completed, including painting, clean exposed surfaces of units. Vacuum clean coils and inside of cabinets.
- 3.5 Provide flexible duct connections for supply and return air duct connections.
- 3.5 **OUTDOOR UNIT INSTALLATION:**
  - A. Where shown on drawings, mount outdoor units on equipment rails on roof. Equipment rails shall be furnished and installed under Division 23. Equipment rail curbs shall be attached to roof decking in compliance with the seismic requirements of the 2012 International Building Code. Bolt units to equipment rails per the seismic requirements of the 2012 International Building Code.
  - B. Install all components in strict accordance with manufacturer's written installation instructions.

END OF SECTION 23 34 23



## **SECTION 23 81 43 - PACKAGED HEAT PUMPS**

### **PART 1 - GENERAL**

- 1.1 Section 23 00 00 Mechanical, General applies to the work specified in this section of specifications.
- 1.2 Provide packaged heat pump units as shown on plans. Cooling and heating capacities shall be as listed on schedule on drawings. The unit shall be properly assembled and tested at the factory. It shall be designed for use with Refrigerant 410a.
- 1.3 Cooling capacity ratings shall be based on ARI standards.
- 1.4 Packaged heat pumps shall be tested in accordance with UL 559 or UL 1995.
- 1.5 Packaged heat pumps shall be Trane models listed on drawings or equal by Carrier or Johnson Controls (York), Lennox, or approved equal.

### **PART 2 - PRODUCT**

- 2.1 Provide horizontal packaged, one piece, air-to-air electric heat pumps designed to function as a year round air conditioning system. Units shall be completely assembled and tested complete with refrigerant charge and ready to operate. The total unit shall listed by U.L. and carry a U.L. label.
- 2.2 All wiring internal to the unit shall be colored and numbered for identification.
- 2.3 All units shall be provided with condenser coil guards.
- 2.4 Electric resistance heaters shall be internally wired nickel chromium elements with controls necessary for complete operation. Safety controls shall include primary high temperature and overcurrent protection. Heaters shall be U.L. listed and shall comply with N.E.C.
- 2.5 Unit compressors shall be welded fully hermetic reciprocating with crankcase heaters and suitable vibration isolators. Compressors shall be of same manufacturer as unit and shall be tested and designed in unit to operate down to -20°F outdoor air temperature on the heating cycle without shutting off. The standard unit shall be capable of operating down to 35°F outdoor air temperature on the cooling cycle. Compressors shall have a five year non-prorated warranty. Where noted in schedule on drawings, provide low ambient kits to allow cooling operation to 0°F.
- 2.6 Indoor and outdoor coils shall be aluminum plate fins mechanically bonded to seamless copper tubes.
- 2.7 Fans and Motors: Indoor air fan shall be forward curved, double width, double inlet, centrifugal type. Belt driven unit motor pulleys shall be adjustable pitch. Indoor fan motor shall have permanently lubricated bearings. Outdoor fans shall be propeller type with direct driven permanently lubricated motor. Fans shall discharge upward. Indoor and outdoor fans shall have internal thermal overload protection.
- 2.8 Unit cabinet shall be constructed of galvanized steel, phosphatized, and finished with an air-dry paint coating with removable access panels. Structural members shall be 16 gauge with access doors and removable panels of minimum 20 gauge. Cabinet interior shall be insulated with ½" thick

neoprene-coated fiberglass. Cabinet panels shall be easily removable for service to all operating components. A condensate drain for the indoor coil shall be provided.

- 2.9 Safety Controls: The heat pump heating/cooling system shall be protected with high pressurestat, low pressurestats, loss-of-charge protection, indoor coil freezestats, and current and temperature sensitive overload devices. Each of these devices shall be wired to prevent compressor restart. Two-compressor units shall have separate and independent refrigeration and control systems designed to allow for standby operation of either compressor if one is locked out. Two-compressor units shall have 2-stage compressor heat and cool with built-in electric strip heat lock out to prevent resistance heat operation above 40°F ambient.
- 2.10 An outdoor coil defrost system shall be incorporated into the base unit to prevent frost accumulation during heating cycle. The defrost cycle shall function on the basis of time and coil temperature. A 90-minute timer shall actuate a defrost mode only if coil temperature is low enough to indicate a heavy frost condition. Defrost shall have a positive termination time of a maximum of 10 minutes or when the defrost thermostat is satisfied to prevent prolonged operation on a defrost cycle. Electric resistance heaters shall operate automatically during the defrost cycle.
- 2.11 Thermostats shall be provided under section 25 55 00, Automatic Temperature Controls.
- 2.12 Emergency heat control shall consist of emergency heat control box containing emergency heat relays and outdoor thermostats; and an emergency heat thermostat subbase (with warning light). Control shall allow for manual bypass of compressor and outdoor thermostats if compressor becomes inoperative, or for service. Outdoor thermostats shall provide for staging of electric resistance heat according to outdoor temperature. Thermostats shall be wired into the electric heater contactors and shall have an adjustable set point to provide economical resistance heat staging.
- 2.13 Time delay circuit to prevent compressor short cycling as a result of a rapid change in thermostat setting and automatically prevents compressor restart at least 5 minutes after shutdown.
- 2.14 Provide for each stage of electric heat on outdoor thermostat to lock out electric heat when outdoor temperature is below its setpoint. Provide emergency heat switch on thermostat to bring on heat if the compressor fails.
- 2.16 Provide unit with filter frames to accept 2" filters, MERV 8.
- 2.17 Provide 14 gauge galvanized all welded seismic curb for each unit. Curbs shall meet the seismic requirements of the 2012 International Building Code. Curb shall be 14" high or a minimum of 8" above the roof insulation. Curb shall be sloped so top of unit is level, verify roof slope prior to ordering curb.

### **PART 3 - EXECUTION**

- 3.1 Mount units on curb installed by a General Contractor. Curbs shall be attached to the concrete roof decking and supplemental steel as required to comply with the seismic requirements of the 2012 International Building Code. Install unit per manufacturer's written installation instructions.
- 3.2 Provide construction filters. Change to throwaway type MERV 8 after substantial completion.
- 3.3 Provide 3" deep PVC P-trap at connection to condensate drain. Pipe PVC condensate drain full size of equipment connection to nearest roof drain.

1600 Hampton Annex - Deferred Maintenance (H27-6107)  
University of South Carolina

122998

- 3.4 Set the minimum position of the outside air hood motorized damper at O.A. CFM listed in schedule on drawings.

END OF SECTION 23 81 43





## **SECTION 23 82 19 - SPLIT SYSTEM HEAT PUMPS**

### **PART 1 - GENERAL**

- 1.1 Section 23 00 00 Mechanical, General applies to the work specified in this section of specifications.
- 1.2 Air handling unit shall be of the same manufacturer as outdoor section of heat pump. See schedule on drawings for capacities.
- 1.3 Provide an outdoor heat pump section as shown on plans. Cooling and heating capacities shall be as listed on schedule on drawings. The unit shall be properly assembled and tested at the factory. It shall be designed for use with Refrigerant 410A.
- 1.4 Equipment shall be Trane models listed on drawings or equal by Carrier, Johnson Controls, Lennox or approved equal.

### **1.5 EQUIPMENT RAILS AND PIPE PENTHOUSES**

Contractor to provide all equipment submittals to equipment supplier for proper selection of equipment rails and pipe penthouses. Equipment rails and pipe penthouses shall be manufactured by Imperial Metals or Roof Product System or approved equal.

### **PART 2 - PRODUCT**

#### **2.1 AIR HANDLING UNITS**

- A. Provide direct-expansion fan coils in the location and manner shown on drawings. Air handling unit shall be equipped with supplementary electric heater as indicated on drawings.
- B. Coil shall be constructed with aluminum plate fins mechanically bonded to nonferrous tubing with all joints brazed. Coil shall have refrigerant metering device, check valve, and refrigerant line fittings. Unit shall have condensate drain pan with drain connections.
- C. Casings shall be insulated and constructed of cold-rolled steel, bonderized and finished with baked enamel. Provide unit with access panels.
- D. Fan for air handlers shall be forward curved with double inlet, mounted on motor shaft, dynamically and statically balanced. Fan motor shall be multi-speed with internal overload protection and be resiliently mounted. Fan-motor shall be removable.

#### **2.2 HEAT PUMP UNITS**

- A. Outdoor unit coil shall be of nonferrous construction. Coil shall have aluminum plate fins, mechanically bonded to seamless copper tubes. Coil shall be protected by a grille. Factory-installed coil refrigerant metering device shall be mounted on unit.
- B. Unit shall be furnished with direct-driven, propeller type fans. Condenser fan motors shall have inherent protection. Fan motors shall be permanently lubricated and resiliently mounted. Each fan shall have a safety guard. Controls shall be included for cycling fan(s) for intermediate season operation.

- C. Compressors shall be hermetically designed with internal spring isolators. Compressors shall have both thermal and current sensitive overload device. Compressor shall be equipped with a crankcase heater and have high-pressure protection. Compressor shall have a 5-year non-prorated warranty. Compressor shall be same manufacturer as unit.
- D. Safety devices shall consist of low pressure switches, pressure relief device and compressor overload devices. An automatic defrost control shall be included to accomplish defrosting of outdoor coil. Control wiring terminal board shall be designed to match indoor unit terminal board and accessory thermostat terminals for standardized point-to-point connectors.
- E. Accessories shall include condenser coil guard, outdoor thermostat, supplemental heat relay, liquid line filter-drier, and crankcase heater.
- F. Thermostats shall be furnished under section 25 55 00 Automatic Temperature Controls. Systems shall be furnished with conventional thermostat interface.

## 2.3 EQUIPMENT RAILS

- A. Roof mounted equipment rails shall be RPS model ER-4A.
- B. The rails shall be 18 gauge galvanized steel, monolithic construction, with integral base plate, continuous welded corner seams, factory installed 2 x 4 nailer and including and 18 gauge galvanized steel counter-flashing complete with screws.

2.4 See Pipe Penthouse detail on drawings.

## PART 3 - EXECUTION

### 3.1 AIR HANDLING UNITS

- A. Provide auxiliary drain pan below air handlers located above ceilings with float switch to cut unit off if pan floods. Tie drain line from pan into primary drain line from air handler with a normally closed gate valve in drain line from pan. Drain auxiliary drain from air handler into auxiliary drain pan. (See detail)
- B. Provide flexible duct connectors at all supply and return connections at each air handling unit.
- C. Provide sway cables attached to the building structure and support points of the air handling for seismic protection per the 2012 International Building Code. Sway cables shall have the allowable slack to prevent transmission of vibration through the cables to the building structure.
- D. All units with refrigerant piping exceeding 80 linear feet shall be provided with expansion valves and accumulators. See section 23 21 13 Mechanical Piping.

### 3.2 **HEAT PUMP UNITS**

Mount units on equipment rails. Bolt units to rails per the seismic requirements of the 2012 International Building Code. Install units per manufacturer's written installation instructions.

END OF SECTION 23 82 19



## **SECTION 25 55 00 - AUTOMATIC TEMPERATURE CONTROLS**

### **PART 1 - GENERAL**

1.1 Section 23 00 00 Mechanical, General applies to the work specified in this section of specifications.

#### **1.2 SCOPE OF WORK**

- A. Provide and install new DDC controls, as manufactured and installed by Johnson Controls, Inc., Columbia, South Carolina as specified. DDC controls must be capable of communicating with, and be compatible with, existing METASYS controllers as manufactured by Johnson Controls.
- B. New DDC controls shall be capable of interfacing with existing campus METASYS Facilities Management System.

#### **1.3 FACILITIES MANAGEMENT SYSTEM**

- A. All necessary hardware and software shall be provided to allow for remote monitoring of the building HVAC control system from the University of South Carolina existing Johnson Controls campus facilities management system (FMS) system. The FMS system software, hardware and communication protocol shall be compatible with the existing Johnson Controls FMS system in every respect.
- B. The existing Johnson Control FMS system shall be expanded as required to accomplish the sequence of operation as described herein. Provide all necessary software and hardware to allow for monitoring and override of all points. All new control points, monitoring points and software points shall be added to the existing FMS database. Separate or parallel systems are not acceptable.
- C. Full graphics capabilities shall be provided at the campus FMS computer. It shall be possible to monitor, override and adjust setpoints from any graphic screen. It shall be possible to download and upload field panel software from the campus FMS computer. Provide all necessary software and hardware needed to accomplish the archiving and downloading and uploading requirements.

#### **1.4 CONTROL SYSTEM**

- A. Direct digital control (DDC) system, as specified herein, shall be provided for control of the new air handling units and new duct mounted heating coils as indicated in the sequence of operation.
- B. The system shall be complete in all respects and shall be installed by trained mechanics in the direct employ of the control equipment manufacturer who is to be responsible for the proper installation and operation of the control equipment. The control manufacturer shall furnish the services of an experienced engineer or superintendent to supervise the installation of the work and to ensure job coordination. All components not specifically indicated or specified, but necessary to make the system function within the intent of the specification, are to be included. Size all control apparatus to properly supply and/or operate and control the apparatus served. All electrical products shall be listed and labeled by UL and comply with NEMA Standards.

## 1.5 SUBMITTALS

The control system manufacturer/installer shall provide the following SUBMITTALS prior to commencement of any work:

- Sequence of operation
- Bill of material
- Hardware system diagrams
- Point to point installation drawings
- Manufacturer's product data sheets.

## 1.6 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. The control contractor shall furnish to the Engineer, upon completion of the work, but before final acceptance of the system, five (5) bound copies of typewritten instructions covering complete maintenance and operation of the system and a complete set of as-built drawings of control diagram.
- B. This Contractor shall instruct the Owner on the care, operation, and maintenance of all parts of the system.

1.7 All electrical work required under this section of specifications shall comply with the latest National Electrical Code. Control system power supply shall be served by a separate breaker and fused in control center for secondary protection.

1.8 Motor starters and variable frequency drives shall be furnished under Division 23. Mounting and wiring of starters and variable frequency drives including wiring to equipment shall be provided by others. Disconnect switches when required shall be provided under Division 26. Provide all wiring, conduits, breakers, transformers, etc. required to power all control components requiring a power source.

1.9 Control wiring shall be run in rigid conduit. Control wiring shall be color coded #16 TFF or TFFN wire with 600 volt insulation.

## PART 2 - PRODUCTS

### 2.1 BUILDING FACILITIES MANAGEMENT SYSTEM (FMS)

- A. The Facility Management System shall be capable of integrating multiple building functions including equipment supervision and control, alarm management, energy management, and historical data collection and archiving.
- B. The Facility Management System shall consist of the following:
  - Network Automation Engines (NAE),
  - Network Thermostatic Controller (TEC),
  - Field sensors and devices,
- C. The system shall be modular in nature, and shall permit expansion of both capacity and functionality through the addition of sensors, actuators, standalone DDC panels, and operator devices.

## 2.2 **SUPERVISORY PANEL - NETWORK AUTOMATION ENGINES (NAE)**

- A. The NAE shall be a fully user-programmable, supervisory controller. The NAE shall monitor the network of distributed application-specific controllers, provide global strategy and direction, and communicate on a peer-to-peer basis with other Network Automation Engines.
- B. Automation network - The NAE shall reside on the automation network and shall support a subnet of system controllers.
- C. Processor - The NAE shall be microprocessor-based with a minimum word size of 32 bits. The NAE shall be a multi-tasking, multi-user, and real-time digital control processor. Standard operating systems shall be employed. NAE size and capability shall be sufficient to fully meet the requirements of this Specification.
- D. Memory - Each NAE shall have sufficient memory to support its own operating system, databases, and control programs, and to provide supervisory control for all control level devices.
- E. Diagnostics - The NAE shall continuously perform self-diagnostics, communication diagnosis, and diagnosis of all panel components. The Network Automation Engine shall provide both local and remote annunciation of any detected component failures, low battery conditions, or repeated failures to establish communication.
- F. Power Failure - In the event of the loss of normal power, The NAE shall continue to operate for a user adjustable period of up to 10 minutes after which there shall be an orderly shutdown of all programs to prevent the loss of database or operating system software.
  - 1. During a loss of normal power, the control sequences shall go to the normal system shutdown conditions. All critical configuration data shall be saved into Flash memory.
  - 2. Upon restoration of normal power and after a minimum off-time delay, the controller shall automatically resume full operation without manual intervention through a normal soft-start sequence.

## 2.3 **NETWORK THERMOSTATIC CONTROLLERS (TEC)**

- A. The networked thermostat shall be capable of controlling split system heat pumps, packaged heat pumps or other similar equipment.
- B. The TEC shall communicate over the Field Controller Bus using BACnet Standard MS/TP Bus Protocol ASHRAE SSPC-135, Clause 9.
- C. The TEC shall be BACnet Testing Labs (BTL) certified and carry the BTL Label.
  - 1. The TEC shall be tested and certified as a BACnet Application Specific Controller (B-ASC).
  - 2. BACnet Protocol Implementation Conformance Statement shall be provided for the TEC.
  - 3. The Conformance Statement shall be submitted 10 days prior to bidding.
- D. The Networked Thermostat shall support remote read/write and parameter adjustment from the web based User Interfaceable through a Network Automation Engine.

- E. The Networked Thermostat shall include an intuitive User Interface providing plain text messages.
1. Two line, 8 character backlit display
  2. LED indicators for Fan, Heat, and Cool status
  3. Five (5) User Interface Keys
    - Mode
    - Fan
    - Override
    - Degrees C/F
    - Up/Down
  4. The display shall continuously scroll through the following parameters:
    - Room Temperature
    - System Mode
    - Schedule Status - Occupied/Unoccupied/Override
    - Applicable Alarms
- F. The Networked Thermostat shall provide the flexibility to support any one of the following inputs:
1. Integral Indoor Air Temperature Sensor
  2. Duct Mount Air Temperature Sensor
  3. Remote Indoor Air Temperature Sensor with Occupancy Override and LED Indicator
  4. Two configurable binary inputs
- G. The Networked Thermostat shall provide a minimum of six (6) levels of keypad lockout.
- H. The Networked Thermostat shall provide the flexibility to adjust the following parameters:
1. Adjustable Temporary Occupancy from 0 to 24 hours
  2. Adjustable heating/cooling deadband from 2° F to 5° F
  3. Adjustable heating/cooling cycles per hour from 4 to 8
- I. Where required by application and indicated on plans or room schedules provide the Networked Thermostat with an integral Passive Infra-Red (PIR) occupancy sensor.
- J. The Networked Thermostat shall employ nonvolatile electrically erasable programmable read-only memory (EEPROM) for all adjustable parameters.

## 2.5 FIELD SENSORS AND DEVICES

- A. Smoke Detectors: Smoke detectors for air handling units, packaged heat pumps, and combination fire/smoke dampers shall be furnished under Division 26, installed in the return duct by Division 23, wired to shut down unit under Division 23, connected to building fire alarm system under Division 26, and power wired by Division 26, see HVAC Automatic Fan Shutdown Diagram on the drawings.
- B. Status and Safety Switches

Switches shall be provided to monitor equipment status, safety conditions, and generate alarms at the FMS when a failure or abnormal condition occurs. Safety switches shall be provided with two sets of contacts and shall be interlock wired to shut down respective equipment.



- C. Outside air sensors shall be designed to withstand the environmental conditions to which they will be exposed. They shall also be provided with a solar shield. Sensors exposed to wind velocity pressures shall be shielded by a perforated plate that surrounds the sensor element. Temperature transmitters shall be of NEMA 3R construction and rated for ambient temperatures. Locate outdoor air temperature sensor on the North side of the building.

D. Electronic Damper Actuators

1. Electronic damper actuators shall be direct shaft mount.
2. Modulating and two-position actuators shall be provided as required by the sequence of operations. Damper sections shall be sized based on actuator manufacturer's recommendations for face velocity, differential pressure and damper type. The actuator mounting arrangement and spring return feature shall permit normally open or normally closed positions of the dampers, as required. All actuators (except terminal units) shall be furnished with mechanical spring return unless otherwise specified in the sequences of operations. All actuators shall have external adjustable stops to limit the travel in either direction, and a gear release to allow manual positioning.
3. Modulating actuators shall accept 24 VAC or VDC power supply, consume no more than 15 VA, and be UL listed. The control signal shall be 2-10 VDC or 4-20 mA, and the actuator shall provide a clamp position feedback signal of 2-10 VDC. The feedback signal shall be independent of the input signal and may be used to parallel other actuators and provide true position indication. The feedback signal of one damper actuator for each separately controlled damper shall be wired back to a terminal strip in the control panel for trouble-shooting purposes.
4. Two-position or open/closed actuators shall accept 24 or 120 VAC power supply and be UL listed. Isolation, smoke, exhaust fan, and other dampers, as specified in the sequence of operations, shall be furnished with adjustable end switches to indicate open/closed position or be hard wired to start/stop associated fan. Two-position actuators, as specified in sequences of operations as "quick acting," shall move full stroke within 20 seconds. All smoke damper actuators shall be quick acting.

E. Control Pilot Relays

1. Control pilot relays shall be of a modular plug-in design with retaining springs or clips.
2. Mounting Bases shall be snap-mount.
3. DPDT, 3PDT, or 4PDT relays shall be provided, as appropriate for application.
4. Contacts shall be rated for 10 amps at 120VAC.
5. Relays shall have an integral indicator light and check button.

2.6 **MISCELLANEOUS DEVICES**

A. Control Panels

1. All control panels shall be factory constructed, incorporating the BMS manufacturer's standard designs and layouts. All control panels shall be UL inspected and listed as an assembly and carry a UL 508 label listing compliance. Control panels shall be fully enclosed, with perforated sub-panel, hinged door, and slotted flush latch.

2. Low and line voltage wiring shall be segregated. All provided terminal strips and wiring shall be UL listed, 300-volt service and provide adequate clearance for field wiring.

**B. Power Supplies**

1. DC power supplies shall be sized for the connected device load. Total rated load shall not exceed 75% of the rated capacity of the power supply.
2. Input: 120 VAC +10%, 60Hz.
3. Output: 24 VDC.
4. Line Regulation: +0.05% for 10% line change.
5. Load Regulation: +0.05% for 50% load change.
6. Ripple and Noise: 1 mV rms, 5 mV peak to peak.
7. An appropriately sized fuse and fuse block shall be provided and located next to the power supply.
8. A power disconnect switch shall be provided next to the power supply.

**PART 3 - EXECUTION**

- 3.1 Remove all wiring, conduits, contactors, relays, transformers, and all other control components serving equipment being removed, see demolition drawings.
- 3.2 Install all control equipment and wiring in a neat and workmanlike manner.
- 3.3 Install and wire network thermostat controllers (TECs) for complete operation. TEC locations are approximate, where conflicts arise with other trades, install as directed by Architect. Install thermostats 4'-6" above finished floor on flush steel boxes.

**3.4 ELECTRICAL WIRING**

- A. All control wiring shall be furnished and installed by the control contractor in accordance with all applicable electrical codes.
- B. Control panels serving equipment fed by emergency power shall be fed by emergency power.
- C. Power wiring to all control panels shall be provided under this section of the specifications. Power circuits to control panels shall not be shared with any other electrical equipment.

**3.5 SEQUENCE OF OPERATION**

- A. Heating and Air Conditioning Units (Packaged Heat Pumps and Split System Heat Pumps):
  1. Occupied Mode: The unit shall be indexed to the occupied mode according to a schedule in the network supervisory controller. When in the occupied mode, the outside air damper shall open, the supply fan shall be started, and the control sequence enabled.
  2. Control Strategy: The electric supplemental heating stages and the compressor shall cycle in sequence to maintain a space temperature setpoint of 74°F. The space temperature setpoint shall be adjusted from the network thermostatic controller (TEC).
  3. Heating (Heat Pumps): When the space temperature falls below the space temperature setpoint, the reversing valve(s) and electric heating stages shall be indexed in sequence to

provide heating when the compressor is running. The electric heating stages shall be prevented from operating at outdoor air temperatures greater than 40°F (adjustable).

4. Cooling: When the space temperature rises above the space temperature setpoint, the reversing valve(s) shall be indexed to provide cooling when the compressor is running.
5. Unoccupied Mode: When in unoccupied mode, the outside air damper shall remain closed and the unit shall cycle as necessary to maintain the unoccupied space temperature setpoint. A differential shall prevent the unit from cycling excessively. The unoccupied space temperature setpoint shall be adjusted from the network supervisory controller.
6. Occupancy and Setpoint Override: An override at the TEC shall index the unit to the occupied mode for a period of 4 hours (adjustable). A space setpoint adjustment, integral to the space sensor, shall allow the occupants to override the space temperature setpoint.
7. Shutdown: When the unit is shutdown by either a stop command or system safety such as unit smoke detector, the unit shall be set as follows:
  - a. Supply fan shall be off
  - b. Outside air damper shall close
  - c. Electric heat shall be off
  - d. Compressor(s) shall be off
8. The integral humidity sensor in each TEC shall be used for monitoring only.
9. Provide a CO2 sensor adjacent to the room temperature sensor serving AH-4/HP-4 (Training Room), to modulate the outside air dampers to maintain the CO2 setpoint in this area of assembly.

- B. Ductless Split Systems AH/HP-8, AH/HP-9, and AH/HP-10 shall operate 24 hours a day, 7 days a week. Each of these (3) system shall have a separate factory furnished, wired navigation controller. Do not daisy-chain these (3) systems.
- C. Ductless Split System AH/HP-11 and AH/HP-12 shall be indexed to the occupied or unoccupied mode by the associated factory furnished, wired navigation controller.

3.6 Furnish to engineer two copies of certifications signed by authorized representative that:

- A. Control system has been checked-out and operates according to drawings and specifications.
- B. All controls are guaranteed unconditionally for one year from date of acceptance and will be serviced for this period free of charge.
- C. Maintenance personnel or responsible party has been instructed as to the operation of control system.

END OF SECTION 25 55 00



PART 1 - GENERAL REQUIREMENTS

1-01 SCOPE OF WORK

WORK INCLUDED: Furnish all necessary labor, material, plant and equipment, including materials and equipment not specifically mentioned but necessary to complete the work in a neat, correct, and workmanlike manner, to include:

- 1) Electrical service, complete to the point of connection with the utility company's facilities.
- 2) Service entrance equipment.
- 3) Feeders, panelboards, and distribution equipment.
- 4) Complete branch circuit wiring system for lighting, receptacles, equipment, and outlets.
- 5) Lighting fixtures, wall switches, receptacles and outlets.
- 6) Line voltage connections to equipment furnished under other Sections of these specifications, including disconnects, where indicated.
- 7) Hangers and Supports for Electrical Systems, see Section 260529.
- 8) Fire Alarm System, see Section 283100.

SPECIAL NOTE: The provisions of the Instructions to Bidders, General Conditions, Supplementary General Conditions and all applicable requirements of Division 1 shall govern the work under this Division the same as if incorporated herein.

1-02 EQUIPMENT WIRING

Furnish and install power circuits to and line voltage connections to all equipment furnished and installed by other trades, including disconnects, where indicated.

Furnish and install receptacles for equipment furnished with cord and plug, such as electric water coolers, kitchen equipment with cord and plug, computer and data processing equipment, portable welders, shop equipment, and other equipment indicated on the drawings.

CONTROL WIRING: Raceways, wiring, and control devices (thermostats, pressure switches, program clocks, etc) for low voltage HVAC control systems and other mechanical and plumbing systems shall be furnished and installed under Division 23, unless otherwise indicated on the drawings or specified in this Division.

ROOFTOP HVAC UNITS: Power circuits for rooftop HVAC units shall rise thru the inside of the HVAC unit curb into the bottom of the unit and out to the disconnect switch mounted on the unit. The Electrical Contractor shall coordinate this work closely with the Mechanical Contractor in the field to avoid conflicts with ductwork.

All Motor Starters and Variable Frequency Drives (VFDs) for HVAC-related equipment that are not factory-mounted and prewired shall be furnished by the Mechanical Contractor, installed and power wired by the Electrical Contractor unless noted otherwise on the design documents. Refer to Mechanical Drawings for locations and quantities of Motor Starters and VFDs.

VOLTAGE: The Electrical Contractor shall supply power to equipment at the voltage indicated on the electrical drawings. The Electrical Contractor and the other applicable trades will be held responsible for coordinating the equipment voltages, the control equipment wiring, and the location and type of disconnect required to comply with the equipment manufacturer's requirements, the National Electric Code, and applicable local building codes. IF EQUIPMENT IS SUPPLIED AT A VOLTAGE OTHER THAN THAT PROVIDED, THE GENERAL CONTRACTOR AND SUBCONTRACTORS WILL BE HELD RESPONSIBLE FOR MAKING ANY NECESSARY ADJUSTMENTS TO CORRECT THE CONFLICT, AT NO COST TO THE OWNER, TO THE SATISFACTION OF THE ELECTRICAL ENGINEER.

1-03 EXISTING CONDITIONS

The Contractor will be held responsible for having visited the site and having familiarized himself with the existing conditions prior to submitting his bid.

1-04 COORDINATION

OTHER TRADES: All work under this Section shall be coordinated with other trades to insure proper location of outlets and equipment connections, and to minimize conflicts with structural members, duct work, piping, etc. Conflicts between equipment and/or material locations shall be corrected as directed by the Architect-Engineer at no additional cost to the Owner.

1-05 CODES AND PERMITS

Installation and materials shall be in accordance with the applicable versions of the National Electrical Code, the International Building Code, and all local codes. Apply and pay for all permits and fees required for this construction.

1-06 DRAWINGS

The drawings and specifications shall be considered as complementary, one to the other, so that materials and labor indicated, called for, or implied by either shall be furnished and installed as if required by both. Where a disagreement exists between the plans and specifications, the item or arrangements of better quality, greater quantity, or higher cost shall be included in the base bid. Any discrepancies between the drawings, specifications, and field conditions shall be resolved with the Engineer prior to commencing work. All agreements shall be verified in writing.

RECORD DRAWINGS: The Contractor shall maintain one set of clean blueprints for "RECORD" drawings. All changes, revisions, or modifications to the project shall be recorded daily on these drawings with redline pencil. Upon completion of the project, these redline drawings shall be turned over to the Engineer for preparation of final Record Drawings.

1-07 MAINTENANCE AND OPERATING MANUALS

The Contractor shall furnish the Owner two (2) complete maintenance and operating manuals for each piece of equipment and material furnished under this project. These manuals shall be bound in hard cover binders with tabs for each section item or piece of equipment. The manuals shall be furnished to the Engineer prior to the final observation, and final acceptance shall not be given until the Owner's maintenance personnel are instructed in maintenance and operation of all systems.

1-08 GUARANTEE

All materials and labor furnished under this Section of the specifications shall be guaranteed by the Contractor to be free from defects for a period of one year from the date of acceptance. The Contractor shall repair or replace any deficiencies reported in the guarantee period promptly after notification, without any additional compensation from the Owner. Lamps are excluded from this warranty, except that all lamps shall be operational on the date of acceptance.

1-09 MATERIALS

UL LISTING: All materials shall be listed by Underwriter's Laboratories, or an approved equal testing laboratory, and shall bear the "UL" Label, where applicable.

SUBSTITUTIONS: Specific reference in the specifications to any article, device, product, material, fixture, form or type of construction, etc., by name, make or catalog number, with or without the words "or equal" shall be interpreted as establishing a standard of quality and shall not be

construed as limiting competition and the Contractor in such cases may, at his option, use any article, device, product, material, fixture, form or type of construction, which in the judgement of the Architect-Engineer, expressed in writing prior to bidding as specified below, is equal to that herein named.

Requests to substitute materials or equipment considered by the Contractor as equal to those specified shall be submitted for review to the Architect-Engineer ten (10) days before bids are taken. Requests shall be accompanied by samples, descriptive literature, and engineering information, as necessary to fully identify and appraise the product. No increase in the contract sum will be considered when requests are not accepted. If the item is found to be equal, the Architect-Engineer will issue an Addendum making it a part of the Contract Documents prior to bidding.

#### 1-10 SUBMITTALS

**Electrical shop drawings shall be submitted in one complete package containing all items required by this specification and all other Division 26-28 specifications. Partial shop drawing submittals may be rejected by the Architect-Engineer.**

**Exceptions: Fire Alarm System CAD drawings may be submitted separately if additional time is needed to prepare these shop drawings.**

**Within 30 days after award of contract and before any materials are delivered to the site, submit one (1) digital set in pdf format to the Architect-Engineer on the following materials (partial/incomplete submittals may be rejected):**

- 1) Section 260500 - Raceways, Fittings, and Surface Wiring Systems.
- 2) Section 260500 - Wire and Cable.
- 3) Section 260500 - Boxes and Wireways.
- 4) Section 260500 - Wiring Devices.
- 5) Section 260500 - Disconnect Switches and Panelboards
- 6) Section 260529 - Hangers and Supports for Electrical Systems (Including Engineer's calculations where required)..
- 7) Section 283100 - Fire Alarm Equipment and Drawings.

No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

Electrical submittal to include a separate transmittal letter indicating project name and address, date, contractor name and address, construction manager name and address (if applicable), list of submittals, and remarks, and signature of transmitter. Each tab/divider shall include project name and name and address of firm or entity that prepared submittal. Failure to comply with the above criteria may result in rejection of the submittal by the Architect-Engineer. Refer to Division 1 for additional Submittal requirements.

### PART 2 - MATERIALS

#### 2-01 RACEWAYS AND FITTINGS

**GALVANIZED RIGID CONDUIT (GRC):** UL 6 and ASA C80.1 with full weight screwed fittings. Bushings shall be malleable iron. Bushings 1 1/4" and larger shall have insulated throat and grounding lug.

INTERMEDIATE GRADE METALLIC CONDUIT (IMC): UL 1242, galvanized, with full weight screwed fittings. Bushings shall be as specified above.

ELECTRICAL METALLIC TUBING (EMT): UL 797 and ASA C80.3 with steel compression or set-screw type fittings. Die-cast fittings are not acceptable. Fittings 1 1/4" and larger shall have nylon insulated throat. Indented or drive-on fittings are not acceptable. Conduit used for Fire Alarm System wiring shall be red, similar to Allied Fire Alarm EMT.

FLEXIBLE STEEL CONDUIT (GREENFIELD): UL 1. Fittings shall be steel.

LIQUIDTIGHT FLEXIBLE STEEL CONDUIT (SEALTITE): UL 360. Fittings shall be steel compression type.

PLASTIC CONDUIT (PVC): Schedule 40 polyvinylchloride. NEMA Standard TC-2 and TC-3 and UL Standards. Conduit, solvent, and fittings shall all be supplied by the same manufacturer. PVC is not permitted above grade.

SURFACE METAL RACEWAY (INDOOR): Wiremold V500 ivory surface metal raceway, or approved equal. Straps, boxes, elbows, etc. shall all be supplied by the same manufacturer. Total cross-sectional area shall be a minimum of 0.20 square inches.

## 2-02 WIRE AND CABLE

UL STANDARDS: UL 44 and UL 83.

CONDUCTOR: Copper, soft drawn, per ASTM B3. Sizes No. 12 and 10 shall be solid conductor. Sizes No. 8 and larger shall have Class B concentric stranding per ASTM B8. Stranded conductors may not be used on No. 12 and No. 10 circuits.

INSULATION: 600 Volt, 75 Deg C rated. Type THHN-THWN-MTW, unless noted otherwise.

SPLICING MATERIALS:

No. 10 and smaller:	Acceptable wire nuts or insulated crimped splice caps.
No. 8 and larger:	Bronze or copper split bolts, or tinned compression connectors. (Polaris insulated splice blocks may not be used on this project).

Insulation shall be Scotch No. 23 rubber tape and Scotch No. 33 plastic tape, or approved equivalent method.

## 2-03 BOXES AND WIREWAYS

OUTLET BOXES: Galvanized sheet steel per UL 514. "Through-wall" boxes SHALL NOT BE USED. Back-to-back mounting of boxes is not permitted. All outlet boxes 4"x4" or smaller located on opposite sides of a rated wall shall have a minimum of 24" horizontal spacing or shall be protected with listed putty pads. All outlet boxes larger than 4"x4" (communications outlets, etc.) located in rated walls shall be protected with listed putty pads.

Box sizes shall be as follows:

- 1) Wall Receptacle Outlets: 4" square by 2 1/8" deep with plaster ring as required.
- 2) Ceiling outlets: 4" square or octagonal by 1 1/2" or 2 1/8" deep with stud or ears where required for fixture support.
- 3) Indoor Surface Mounted Outlets: Wiremold V5744S-2 surface metal box unless noted otherwise on the drawings (steel boxes and EMT conduit may be used in equipment rooms, janitor's closets, storage rooms).



- 4) Exposed Outlets: Malleable iron or heavy duty cast aluminum with threaded hubs, Type FS, FD, or GS. Manufactured by Crouse Hinds, Appleton, Killark, or approved equal. Die cast boxes are not acceptable.

WIREWAYS, PULL BOXES AND JUNCTION BOXES: UL 50. Code gage galvanized sheet steel, aluminum, or steel primed and painted after fabrication. Manufactured by Square D, Austin Berryhill, Hoffman Engineering, B-Line Systems, or approved equal. Wireways shall have hinged covers.

## 2-04 WIRING DEVICES

MANUFACTURERS: All wiring devices shall be Hubbell Extra Heavy-Duty Specification Grade Series or equivalent of Arrow Hart Premium Industrial Spec Grade, Pass and Seymour Heavy-Duty Spec Grade, or Leviton Industrial Spec Grade, unless specifically noted otherwise. If devices not meeting the specifications are supplied, they shall be removed, discarded, and new devices meeting the specification shall be furnished & installed by the Electrical Contractor at no cost to the Owner or the Engineer.

RECEPTACLES: 20A, 125V, 3 wire grounding, NEMA 5-20R, side and back wired, with impact resistant nylon face and standard color as selected by Architect.

- "TR" denotes Tamper-Resistant receptacle. Tamper Resistant receptacles shall be listed Tamper-Resistant receptacles per NEC Article 406.11, typical for receptacles in Dwelling Units, Kindergartens, and Childcare Areas.
- "CR" denotes indoor Corrosion Resistant receptacle. Indoor Corrosion Resistant receptacles shall be listed Weather/Corrosion Resistant receptacles per NEC Article 406.8.
- "WP" denotes weatherproof receptacle. Weatherproof receptacles shall be listed Weather/Corrosion Resistant receptacles per NEC Article 406.8 and shall include a wet location cover.

- 1) Duplex Receptacle: Hubbell HBL-5362-X
- 2) Duplex Receptacle, Tamper Resistant (NEC 406.11): Hubbell HBL-5362-X-TR
- 3) Duplex Receptacle, Corrosion Resistant (NEC 406.8): Hubbell HBL-5362-X-WR
- 4) Single Receptacle: Hubbell HBL-5361-X
- 5) Isolated Ground Duplex Receptacle: Hubbell IG-5362-X

GFCI RECEPTACLES: Feed Thru type, 20A, 125V, NEMA 5-20R, standard color as selected by Architect. All GFCI Receptacles shall be listed Tamper Resistant (NEC 406.11) and Weather Resistant (NEC 406.8).

- 1) GFCI Duplex Receptacle: Hubbell GFR-5362-X-TR
- 2) Faceless GFCI: Hubbell GFBF20-X-L

SWITCHES: 20A, 120/277V, side and back wired, ivory color. Single pole, double pole, three way, or four way, as indicated on the drawings. Standard color as selected by Architect.

- 1) Single Pole Switch: Hubbell HBL-1221-X
- 2) Double Pole Switch: Hubbell HBL-1222-X
- 3) Three Way Switch: Hubbell HBL-1223-X
- 4) Four Way Switch: Hubbell HBL-1224-X

SPECIAL RECEPTACLES: Specification grade, rating as specified on the drawings.

COVER PLATES: Provide plates to suit the devices.

- 1) Finished interior walls: Jumbo Stainless Steel.

- Receptacles noted on drawings as dedicated for computers shall include a factory engraved jumbo stainless steel coverplate labeled "COMPUTER". See Electrical Symbols and Power Plans on drawings to identify dedicated computer receptacle.
- 2) Exposed outlets: Galvanized steel.
- 3) Wet locations: Weatherproof "In Use" type for wet location areas, hinged weatherproof type for damp location covered areas.

## 2-05 SAFETY SWITCHES AND FUSES

SWITCHES: NEMA Standard HD, heavy-duty type, 3 pole, 480 or 240 volt, as indicated, with Class R fuse clips. Manufactured by Square D, General Electric, Cutler Hammer, or Siemens.

FUSES: Time delay type, UL Class RK5. Bussman Fusetrons, or approved equal of Chase-Shawmut or General Electric.

NAMEPLATE: Provide engraved nameplate for each safety switch identifying load served, voltage, and fed-from identification. Example:

**AHU-1, 208-3-60  
FED FROM MP-15**

## 2-06 PANELBOARDS

STANDARDS: UL 67 and NEMA PB-1.

MANUFACTURERS: Square D, General Electric, Cutler Hammer, or Siemens.

CONSTRUCTION: Code gage cabinet with clamping trim cover and locking doors, keyed alike. Cabinets shall be minimum 20" wide. Busses shall be for bolt-in breakers with full sized neutral bus. Provide ground bus in each panelboard.

ENCLOSURE: Flush or surface mounted, NEMA 1, NEMA 3R, or NEMA 4X as indicated on drawings.

- 1) Front: Surface-mounted fronts, match box dimensions; Flush-mounted fronts, overlap box.
- 2) Directory Card: Inside panelboard door, mounted in metal frame with transparent protective cover. Provide typewritten circuit directory for each panel identifying load served and room location. Identify spares in pencil.
- 3) Panels and Trim Finishes: Galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two (2) coat, baked-on finish consisting of prime coat and thermosetting topcoat.

CIRCUIT BREAKERS: Molded case bolt in type. Breakers shall be rated for the specified panelboard interrupting capacity rating in RMS symmetrical amperes. Two and three pole breakers shall have common internal trip. Branch mounted main breakers are not permitted unless specifically noted on the drawings. Circuit breakers for existing panelboard shall be compatible with existing panelboards, verify breaker type required prior to ordering.

NAMEPLATE: Provide engraved nameplate for each panel identifying panel name, voltage, phase, and fed-from identification. Example:

**PANEL HA  
208/120V, 3PH  
FED FROM MP-2**

## 2-07 NAMEPLATES

NAMEPLATE: Provide engraved 3-ply laminated plastic nameplates for each panelboard, safety switch, transformer, enclosed circuit breaker, contactor, and lighting control panel. Attach to equipment cover using metal screws, rivets, or industrial epoxy cement. Manufacturer's sticky-back adhesive is not acceptable. Use 1/4" white letters on black field for normal power items. Use 1/4" white letters on red field for emergency power items (generator).

## PART 3 - EXECUTION

### 3-01 GENERAL REQUIREMENTS

WORKMANSHIP: All work shall be installed in a neat and orderly manner. Devices, cabinets, covers, fixtures, exposed raceways, etc., shall be aligned parallel or perpendicular to the building walls, ceiling, and floor. Wiring in panelboards and cabinets shall be neatly looped and laced, and not wadded. The Owner reserves the right to require repair or replacement of defective workmanship and material without additional compensation to the Contractor.

SUPPORTS: Conduits, boxes, cabinets, enclosures, lighting fixtures, etc., shall be securely supported by structural members or structural walls at intervals required by the NEC or as recommended by the manufacturer. Plaster, gypsum board, acoustical tile, and other ceiling and wall finish materials shall not be used for support.

Recessed fluorescent, incandescent, and H.I.D. fixtures and recessed ceiling speakers shall be independently supported by two (2) or four (4) #12 steel hanger wires. Hanger wires shall be hung within 10 degrees of plumb, and shall be securely tied to structural members such as steel joists or beams, or to steel angles or tubing which bridge structural members. All wiring located above fire rated assemblies must comply with 300.11 (A) 1 of the 2011 NEC.

CUTTING, PATCHING, AND PAINTING: The Electrical Contractor shall perform all boring, drilling, and cutting of walls, ceilings, and floors as required to install and support his raceways and equipment. Provide rough patching to seal penetrations through walls, ceilings, and floors. Finish patching and painting will be performed by the General Contractor.

FIRE WALL PENETRATIONS: Penetrations through fire rated walls and floors shall be sealed to maintain the integrity of the fire rating. Raceways through penetrations shall be in metal raceways. Penetration openings shall be sealed after the installation of the raceway with UL-49 listed fire retardant material, as manufactured by Chase Technology, 3M, Hilti, or approved equal. Penetrations shall be sealed in accordance with UL-49 requirements and the manufacturer's instructions. Coordinate manufacturer with the General Contractor so that all trades on the project use the same manufacturer.

Through penetrations of conduits and cables of fire resistance rated walls must comply with Section 714.3.1 of the IBC. Through penetrations of fire resistance ceiling assemblies must comply with section 714.4.1.1 of the IBC.

Where cable trays and/or signal cables penetrate rated walls the Electrical Contractor shall furnish and install a UL Listed rated assembly, Specified Technology, Inc. (STI) EZ-Path Triple Cable Pathway System, or equivalent system by Wiremold or Cooper. See details on drawings.

ROOF PENETRATIONS: Do not penetrate roof or flashing unless permitted, in writing, by the Architect-Engineer.

**TRENCHING AND BACKFILL:** The Electrical Contractor shall perform all excavation, trenching, and backfilling necessary to install his work. Trenches shall be run after final grades are established, and shall be run at 24 inches minimum depth from finished grades. Contact all underground utilities (electric, telephone, cable TV, gas, water, sewer) and establish locations of underground utilities prior to digging. Damages to underground utilities will be repaired by the Owner of the line, and the Contractor responsible for such damage will pay all costs of repairs. After completion of backfilling operations, restore the disturbed areas to their original condition by leveling, raking, seeding and mulching.

### 3-02 GROUNDING

**CODE:** Entire system shall be grounded and bonded in accordance with the requirements of Article 250 of the National Electrical Code.

**MAIN SERVICE:** Electrical service shall be grounded to the building structural steel, to the main cold water pipe within 5-feet of entrance to the building (or to the nearest indoor metal water piping when the main is PVC), and to driven ground rods as required by the National Electrical Code. Grounding point shall be inside the Main service equipment.

**FEEDERS AND BRANCH CIRCUITS:** Each feeder raceway shall be bonded to every cabinet, pull box, etc., to which it is connected by grounding bushings and bonding jumpers sized per NEC Table 250.122. Each branch circuit raceway must be connected to every cabinet, pull box, outlet box, etc., with double locknuts. Separate grounding conductors shall be installed on all feeders and on all lighting, receptacle and equipment branch circuits, whether indicated on the drawings or not. Size per NEC 250.122.

**RECEPTACLES AND FIXTURES:** Bond grounding terminal of each receptacle and fluorescent fixture to its outlet box with No. 12 green ground wire. Self-grounding receptacles are not acceptable as a substitute for this requirement.

**DRY-TYPE TRANSFORMERS:** Bond transformer secondary to building steel with full sized equipment grounding conductor per NEC Table 250.66.

### 3-03 RACEWAYS

**WIRING:** All wiring shall be installed in raceways, unless noted. Raceways shall be run concealed, unless noted.

**MAIN SERVICE:** Existing to remain, maintain during demolition and construction.

**FEEDERS:**

- 1) Feeders shall be run in GRC or IMC where run exposed.
- 2) Feeders shall be run in GRC, IMC, or EMT where run concealed in walls or ceilings
- 3) Feeders shall be run in GRC or concrete encased PVC with 2-inches minimum concrete encasement where run underground (Schedule 40 PVC is not required to be encased in conduit where run under the concrete floor slab).
- 4) Where PVC is used, elbows for turn-outs and risers shall be GRC.
- 5) PVC is not permitted above grade.
- 6) Metal conduits installed in contact with earth shall be painted with 2 coats Rustoleum paint or other acceptable preservative.

**BRANCH CIRCUITS:**

- 1) Branch circuits shall be run concealed where practical.
- 2) Branch circuits run concealed in walls or ceilings shall be run in EMT, GRC, or IMC.

- 3) Branch circuits run exposed to weather on exterior walls or on roofs shall be run in GRC or IMC with screwed fittings.
- 4) Branch circuits run exposed in dry, finished spaces shall be run in Wiremold surface metal raceway.
- 5) Branch circuits run exposed in damp locations, unfinished spaces (attics), and unoccupied spaces (storage room, equipment rooms, janitor's closet) may be run in EMT in lieu of Wiremold.
- 6) Branch circuits run underground shall be run in GRC, IMC, or Schedule 40 PVC plastic conduit.
- 7) All interior conduit homeruns to panelboards shall be run overhead in EMT, GRC, or IMC unless noted otherwise on the drawings.
- 8) Underground conduits shall be run 24" minimum below grade.
- 9) Metal conduits installed in contact with earth shall be painted with 2 coats Rustoleum paint or other acceptable preservative.
- 10) Where plastic conduits are indicated, transition from plastic to GRC or IMC below grade or slab and rise with GRC or IMC. PVC is not permitted above grade. EXCEPTION: Plastic conduit may enter floor mounted switchboards.

**FIRE ALARM SYSTEM CONDUIT:** Conduit used for Fire Alarm System wiring shall be red, similar to Allied Fire Alarm EMT.

**FLEXIBLE CONDUITS:** Recessed fluorescent and incandescent fixtures located in accessible ceilings may be connected to an outlet box above the ceiling thru flexible conduit "whips". Run a separate ground wire in all conduit, including flexible fixture whips. DO NOT loop flexible conduit from one fixture to another. Metal-clad cable fixture whips shall be permitted for light fixture whips provided they do not exceed 6-feet in length and are provided by the light fixture manufacturer.

Final connections to motors, motor driven equipment, transformers, and vibrating equipment shall be made thru flexible conduit, 36" maximum length. "Sealtite" flexible metal conduit shall be installed outdoors, in equipment rooms, and in wet locations.

**PULL WIRES:** Raceways for wiring by others or for future shall contain a No. 14 galvanized steel pull wire or equivalent plastic cord with 200 lb. tensile strength.

**INSTALLATION:** Ream raceways, butt ends into couplings, 3 quarter bends per run maximum, plug raceways until wiring is pulled in place. Exposed conduits shall be run parallel and perpendicular to walls, floor, and ceiling. Multiple conduit runs shall be racked using Unistrut or Kindorf channels and pipe clamps. Install conduits in concrete slabs between the top and bottom layers of reinforcing steel. Maximum size of conduits in slabs is 1 inch. Crossing of conduits in slabs shall be avoided, if possible.

**PULL BOXES:** Maximum length between pull points shall be 200 ft. for pulls with two 90 degree bends, and 100 ft for pulls with three 90 degree bends. Furnish and install pullboxes, junction boxes, handholes, or conduit bodies where bends or pulling lengths exceed these specifications.

**EXPANSION JOINTS:** Furnish and install expansion joints where conduit crosses building expansion joints and for straight runs exceeding 100 ft. in length.

**PLASTIC CONDUIT:** Do not damage conduit while making field bends and offsets, cutting and joining conduit. Use GRC elbows where length between pulls exceeds 100 ft. Clean conduit prior to applying solvent. Insure that conduit extends fully into coupling or fitting when making joints.

**MINIMUM SIZE:** Home runs to panelboards shall be 3/4" minimum, otherwise raceways shall be 1/2" minimum, except that flexible conduit shall be 3/8" minimum.

### 3-04 WIRE AND CABLE

MINIMUM SIZE: No. 12 for power circuits, No. 14 for control circuits, unless noted. Where home run exceeds 75 ft. length on 120 volt circuits, use No. 10 minimum.

COLOR CODE: No. 12 and No. 10 shall have color-coded insulation. No. 8 and larger shall be marked at all terminals and joints with color-coded tape. Color code as follows:

<u>Voltage</u>	<u>Phase A</u>	<u>Phase B</u>	<u>Phase C</u>	<u>Neutral</u>	<u>Grounding</u>
240/120	Black	Orange	Blue	White	Green
208/120	Black	Red	Blue	White	Green
480/277	Brown	Orange	Yellow	Gray	Green

INSTALLATION: Insure that raceway system is complete and that conductors will be free from moisture or physical damage prior to installing conductors. Install all conductors at the same time. Do not exceed cable manufacturer's recommended pulling tension for conductors. Where required, lubricate cables with Ideal Yellow 77, Burndy Slikon, or other acceptable cable lubricant. Do not use lubricants that are not acceptable to the Architect-Engineer.

SPLICING: Splices on Sizes No. 10 and smaller shall be made with wire nuts. Splices on Sizes No. 8 and larger shall be made with split bolt connectors, compression connectors, or solderless lugs. Splices shall be insulated with two or more layers of Scotch 23 rubber tape covered with two or more layers of Scotch 33 plastic tape, or acceptable equivalent method.

MULTIWIRE BRANCH CIRCUITS: Shared or common neutrals are not permitted on this project for multiwire branch circuits. The Contractor shall pull a separate neutral for all 120V & 277V circuits.

### 3-05 BOXES

WALL OUTLETS: Flush mounted, unless noted. Boxes shall be securely mounted to wall studs or be grouted in masonry. Boxes shall have single or multi-gang plaster rings, as required. "Through-wall" boxes SHALL NOT BE USED. Back-to-back mounting of boxes is not permitted. Boxes on opposite sides of a rated wall shall have a minimum of 24" horizontal spacing or shall be protected with listed putty pads.

CEILING OUTLETS: Flush mounted or concealed above ceiling. Boxes for fixture support shall have studs or ears as required and shall be securely supported by adjustable bar hangers or steel angle.

JUNCTION BOXES, PULL BOXES, AND WIREWAYS: Shall be sized and installed as indicated on the drawings or where required by NEC for pulling or splicing wiring. All junction boxes and pull boxes shall be accessible. Junction boxes and pull boxes shall not be located above inaccessible ceilings.

LOCATIONS: Verify door swings and mount switches on strike side, 6" from jamb. Verify counter heights and arrangement prior to setting boxes. The Owner reserves the right to move any outlet by as much as 10 ft. from its indicated location at no additional cost, provided the Contractor is notified prior to roughing in.

### 3-06 WIRING DEVICES

INSTALLATION: Devices shall be installed as indicated on the drawings and wired in accordance with the manufacturer's instructions.

MASKING: Devices shall be masked to prevent painting of faces and handles during construction. Do not install cover plates until clean up has been completed.

COVER PLATES: Cover plates shall be installed on all wiring devices, telephone and computer outlets, junction boxes, and outlet connections.

3-07 PANELBOARDS

INSTALLATION: Mount top of panelboards 6'-6" above floor. Connect circuits as indicated on the drawings, observing correct color code and numbering. Mark all wires in panelboard with circuit number.

DIRECTORY: Provide typewritten circuit directory for each panel identifying load served and room location. Identify spares in pencil. Panelboard schedules must comply with NEC 408.4, including listing room description and room number for each load. Turn all spare breakers off.

3-08 SAFETY SWITCHES

LOCATION: Mount switches where shown on drawings and within sight of equipment served. Mount in a readily accessible location unless noted. Verify fuse sizes with equipment manufacturer's requirements.

3-09 MAIN SWITCHBOARD

SWITCHBOARD: Existing switchboard to remain. Provide new nameplates for switchboard and for each breaker.

3-10 COMPLETION OF WORK

TESTS AND FINAL REVIEW: Upon completion of work, the entire system shall be completely operational and tested to conform with these specifications and drawings, and shall be reviewed by the Architect-Engineer. All defects in workmanship and material shall be immediately corrected without additional compensation to the Contractor.

The final review of the electrical installation by the Engineer cannot be provided until the following items have been submitted to the Engineer for review:

- 1) Letter from the Electrical Contractor on company letterhead indicating that the installation is complete and ready for a final review.
- 2) Signed and dated certificate indicating that the specified functional tests of the Fire Alarm System have been performed.

**Failure to submit the above documentation prior to requesting the Engineer's Final Review of the project may result in delays in providing the final review. The Engineer assumes no liability for delays in the project resulting from failure to provide the proper documentation.**

The system will not be considered complete until Record Documents are provided and training of facility personnel on the system operation is complete. This facet of the services to be provided by the Contractor is deemed very important to the satisfactory completion of the contract and the installation cannot be deemed complete until these services have been provided in accordance with the Contract Documents.

CLEAN UP: Upon completion of all installations and prior to final acceptance by the Owner, remove all debris from the site. Clean and touch up paint on fixture lenses and trims, cabinets, enclosures, cover plates, etc.

END OF SECTION 260500





## PART 1 - GENERAL REQUIREMENTS

### 1-01 SUMMARY

#### SECTION INCLUDES:

- 1) Hangers and supports for electrical equipment and systems.
- 2) Construction requirements for concrete bases.

### 1-02 PERFORMANCE REQUIREMENTS

- 1) Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- 2) Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- 3) Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- 4) Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

### 1-03 SUBMITTALS

- 1) Product Data: For steel slotted support systems.
- 2) Shop Drawings: Shop Drawings shall show fabrication and installation details and include calculations for the following:
  - a. Trapeze hangers. Include Product Data for components.
  - b. Steel slotted channel systems. Include Product Data for components.
  - c. Equipment supports.
- 3) Welding Certificates.

### 1-04 QUALITY ASSURANCE

- 1) Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- 2) Comply with NFPA 70.

## PART 2 - PRODUCTS

### 2-01 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- 1) Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
  - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - i. Allied Tube & Conduit.
    - ii. Cooper B-Line, Inc.; a division of Cooper Industries.

- iii. ERICO International Corporation.
  - iv. GS Metals Corp.
  - v. Thomas & Betts Corporation.
  - vi. Unistrut; Tyco International, Ltd.
  - vii. Wesanco, Inc.
  - c. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  - d. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
  - e. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
  - f. Channel Dimensions: Selected for applicable load criteria.
- 2) Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- 3) Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- 4) Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- 5) Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- 6) Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
- a. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
    - i. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - ii. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - Hilti Inc.
      - ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      - MKT Fastening, LLC.
      - Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
  - b. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel or stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
    - i. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - ii. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - Cooper B-Line, Inc.; a division of Cooper Industries.
      - Empire Tool and Manufacturing Co., Inc.
      - Hilti Inc.
      - ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      - MKT Fastening, LLC.
  - c. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
  - d. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
  - e. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
  - f. Toggle Bolts: All-steel springhead type.

- g. Hanger Rods: Threaded steel.

## 2-02 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- 1) Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- 2) Materials: Comply with requirements in Division 05 Section "Metal Fabrications" for steel shapes and plates.

## PART 3 - EXECUTION

### 3-01 APPLICATION

- 1) Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- 2) Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- 3) Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
  - a. Secure raceways and cables to these supports with two-bolt conduit clamps.
- 4) Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

### 3-02 SUPPORT INSTALLATION

- 1) Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- 2) Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.
- 3) Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).
- 4) Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  - a. To Wood: Fasten with lag screws or through bolts.
  - b. To New Concrete: Bolt to concrete inserts.
  - c. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  - d. To Existing Concrete: Expansion anchor fasteners.
  - e. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
  - f. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts; beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69; or spring-tension clamps.
  - g. To Light Steel: Sheet metal screws.

- h. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
- 5) Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3-03    INSTALLATION OF FABRICATED METAL SUPPORTS

- 1) Comply with installation requirements in Division 05 Section "Metal Fabrications" for site-fabricated metal supports.
- 2) Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- 3) Field Welding: Comply with AWS D1.1/D1.1M.

3-04    CONCRETE BASES

- 1) Construct concrete bases of dimensions indicated but not less than 4 inches (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- 2) Use 3000-psi, 28-day compressive-strength concrete.
- 3) Anchor equipment to concrete base.
  - a. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - b. Install anchor bolts to elevations required for proper attachment to supported equipment.
  - c. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3-05    PAINTING

- 1) Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- 2) Touchup: Comply with requirements in Division 09 for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- 3) Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529

## **PART 1 - GENERAL REQUIREMENTS**

### **1-01 QUALIFICATIONS OF INSTALLER:**

**NOTE: EACH AND ALL ITEMS OF THE FIRE ALARM SYSTEM, INCLUDING WIRING, SHALL BE FURNISHED AND INSTALLED BY THE FIRE ALARM SYSTEM SUPPLIER (CONDUIT WITH PULL WIRES AND BOXES MAY BE INSTALLED BY THE ELECTRICAL CONTRACTOR). ANY WIRING OR FIRE ALARM EQUIPMENT FOUND TO BE INSTALLED BY THE ELECTRICAL CONTRACTOR SHALL BE REMOVED, DISCARDED, AND NEW FURNISHED & INSTALLED BY THE FIRE ALARM SYSTEM SUPPLIER AT NO COST TO THE OWNER OR THE ENGINEER.**

### **1-02 GENERAL SYSTEM REQUIREMENTS:**

Section 260500, "Basic Materials and Methods" applies to this section, with the additions and modifications specified herein.

NFPA COMPLIANCE: The complete installation is to conform to Local Code Requirements and to the requirements of the AHJ enforced editions of the following publications including amendments:

- a) NFPA 13: Standard for the installation of sprinkler systems (applicable sections)
- b) NFPA 70: National Electrical Code (with particular attention to ARTICLE 760)
- c) NFPA 72: National Fire Alarm Code
- d) NFPA 101: Life Safety Code

UNDERWRITERS LABORATORIES: Each and all items of the Fire Alarm System shall be listed as a product of a SINGLE Fire Alarm System manufacturer under the appropriate category by Underwriters' Laboratories, Inc. (UL), and shall bear the "UL" label. All control equipment is to be listed under UL category UOJZ as a single control unit. Partial listing shall NOT be acceptable. The fire alarm system shall be manufactured by an ISO 9001 certified company and meet the requirements of BS EN9001: ANSI/ASQC Q9001-1994. Visual signaling appliances shall be listed under UL 1971.

INTERNATIONAL BUILDING CODE COMPLIANCE: The entire installed system and all integrated system operations shall be within the guidelines of the 2012 International Building Code (IBC) and the 2012 International Fire Code (IFC) unless superseded by architectural specifications

ADA COMPLIANCE: The fire alarm installation shall comply with the requirements of Appendix B, "ADA Accessibility Guidelines" of the American Disabilities Act for alarm systems.

NEMA STANDARD SB 4 COMPLIANCE: The complete installation is to comply with the applicable fire alarm installation sections of NEMA Standard SB 4.

All references to manufacturer's model numbers and other pertinent information herein is intended to establish minimum standards of performance, function and quality. Equivalent compatible UL-listed equipment from other manufacturers may be substituted for the specified equipment as long as the minimum standards are met.

The fire alarm cabinet for this project must be UL 864 Ninth Edition Listed.

Specific reference in the specifications to any article, device, product, material, fixture, form or type of construction, etc., by name, make or catalog number, with or without the words "or equal" shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition and the Contractor in such cases may, at his option, use any article, device, product, material, fixture, form or type of construction, which in the judgment of the Architect-Engineer, expressed in writing prior to bidding as specified below, is equivalent to that herein named.

The drawings and specifications shall be considered as complementary, one to the other, so that materials and labor indicated, called for, or implied by either shall be furnished and installed as if required by both. Where a disagreement exists between the plans and specifications, the item or arrangements of better quality, greater quantity, or higher cost shall be included in the base bid. Any discrepancies between the drawings, specifications, and field conditions shall be resolved with the Engineer prior to commencing work. All agreements shall be verified in writing.

**1-03 DESCRIPTION OF WORK:**

The work includes the installation of a complete fire alarm system including associated equipment and appurtenances, complete and ready for operation. Equipment, materials, installation, workmanship, review, and testing shall be in strict accordance with the required and advisory provisions of "NFPA 72: National Fire Alarm Code". Devices and equipment for fire alarm service shall be listed by Underwriters Laboratories Inc. The system and its components shall be Underwriters Laboratories, Inc. listed under the appropriate UL testing standard as listed herein for fire alarm applications and the installation shall be in compliance with the UL listing.

**WARRANTY: All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least one (1) year from the date of acceptance. The full cost of maintenance, labor and materials required to correct any defect during this one year period shall be included in the submittal bid. The Contractor shall repair or replace any deficiencies reported in the guarantee period promptly after notification, without any additional compensation from the Owner.**

As part of the above one-year warranty, the Contractor shall provide the following maintenance and testing, once at the 6-month point and a second time at the twelve-month point of the warranty period. The date of the two maintenance and testing sessions shall be scheduled as part of the fire alarm system closeout documents and shall be coordinated with the Owner and the Engineer prior to acceptance of the fire alarm system. The cost of this work shall be included in the Base Bid.

- a. Examination, adjustment and cleaning of all detectors, manual fire alarm stations, control panels, power supplies, relays, waterflow switches and all accessories of the fire alarm system.
- b. Each circuit in the fire alarm system shall be tested semiannually.
- c. Each smoke detector shall be tested in accordance with the requirements of NFPA 72.

The Contractor shall provide lightning protection for the fire alarm system and fire alarm circuits per the Manufacturer's recommendation. The Contractor shall provide lightning protection for the two (2) telephone lines serving the fire alarm system.

Furnish and install wiring materials under this section as specified in Section 260500, "Basic Materials and Methods," with the additions and modifications specified herein. Furnish materials and equipment that are current products of one manufacturer regularly engaged in the production of such equipment.

**1-04 SYSTEM DESCRIPTION:**

A new addressable, intelligent reporting, microprocessor controlled fire detection system shall be installed in accordance to the project specifications and drawings. Furnish and install all items hardware, software, programming, and factory setup required to provide a complete and operable fire alarm system. Addressable devices shall have the capability to be enabled or disabled individually without affecting other devices.

**BASIC PERFORMANCE:**

- a. Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded on NFPA Class B Signaling Line Circuits (SLC).
- b. Initiation Device Circuits (IDC) shall be wired Class B as part of an addressable device connected by the SLC Circuit.
- c. Notification Appliance Circuits (NAC) shall be wired Class B as part of an addressable device connected by the SLC Circuit.
- d. Alarm signals arriving at the FACP shall not be lost following a primary power failure (or outage) until the alarm signal is processed and recorded.
- e. NAC speaker circuits shall be arranged such that there is a minimum of one speaker circuit per floor of the building or smoke-zone whichever is greater.
- f. Audio amplifiers and tone generating equipment shall be electrically supervised for normal and abnormal conditions.
- g. NAC speaker circuits and control equipment shall be arranged such that loss of any one (1) speaker circuit will not cause the loss of any other speaker circuit in the system.
- h. Two-way telephone communication circuits shall be supervised for open and short circuit conditions.
- i. All panels and peripheral devices shall be the standard product of a single manufacturer and shall display the manufacturer's name on each component.
- j. All manual pull stations, building smoke detectors, building heat detectors, elevator smoke detectors, and extinguishing systems shall sound the building fire alarm upon activation unless specifically noted otherwise. The sprinkler tamper switch, duct smoke detectors, and door release smoke detectors shall sound a supervisory signal only upon activation, unless noted otherwise. The fire alarm control panel shall allow for on-site programming to change any device(s) signal.

**BASIC SYSTEM FUNCTIONAL OPERATION:** When a fire alarm condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur:

- a. The system alarm LED on the system display shall flash.
- b. A local piezo electric signal in the control panel shall sound.
- c. A backlit LCD display shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises.
- d. Printing and history storage equipment shall log the information associated each new fire alarm control panel condition, along with time and date of occurrence.
- e. All system output programs assigned via control-by-event interlock programming to be activated by the particular point in alarm shall be executed, and the associated system outputs (notification appliances and/or relays) shall be activated.

**TRANSIENT VOLTAGE SURGE SUPPRESSION(TVSS):** In addition to the specific surge protection device locations named herein, surge protection shall be provided at each end of all signaling circuits, at all locations where signaling cable enters the building from outside, at all control panel terminations and areas recommended by the manufacturer.

**1-05 SUBMITTALS:** Fire alarm equipment, devices and cabling shall not be ordered until manufacturer's data and shop drawings as described herein are submitted by the contractor and approved by the engineer.

Submit Manufacturer's Data for:

- a. Control Panel and Cabinet(FAC)
- b. Digital Communicator (DACT) with Surge Protector
- c. Remote Annunciator Panels (FAA)
- d. 24VDC Power Extenders (FPE)
- e. Batteries and Battery Charger
- f. Audible/visual alarm notification devices

- g. Synchronization Control Modules (SCMs)
- h. Manual Stations
- i. Each type of Smoke, Heat, and Duct Detectors
- j. Magnetic Door Holders
- k. Monitoring Modules (MMs) and Control Modules (CMs)
- l. As-Built Cabinet
- m. Fire alarm cable
- n. Any other fire alarm equipment items required by the drawings or specifications
- o. Fire Stop Materials

Data submittals for each item shall provide evidence of listing by Underwriter's Laboratories as fire alarm equipment.

LIST OF SYSTEM ADDRESSES: Provide a list of system addresses for every addressable device.

INPUT OUTPUT MATRIX: Provide descriptions of all system operations.

SHOP DRAWINGS: Fire Alarm Shop Drawings shall comply with the requirements of 907.1.1 of the International Fire Code – 2009. Provide drawings that clearly and completely indicate the function of the control panel and devices connected thereto. Indicate termination points of devices and indicate the interconnection of modules required for proper operation of the system and connections to other systems including but not limited to HVAC systems, fire protection systems, fire pump controllers, and elevator controls. Include manufacturer's name(s), model numbers, ratings, power requirements, equipment layout, device arrangement, complete wiring point-to-point diagrams, and conduit layouts.

Equipment Supplier shall submit scaled shop drawings indicating exact routing of raceways, locations of junction boxes and number, size and type of conductors in each raceway for the fire alarm system. The Electrical Contractor shall use the reviewed drawing for rough-in of fire alarm system raceways and outlet boxes.

CALCULATIONS: Provide electrical load calculation for system power supplies, standby power supplies, each alarm notification circuit and standby batteries. Calculations shall verify that battery capacity exceeds supervisory and alarm power requirements. Provide battery calculations and voltage drop calculations with shop drawing submittal. Use NAC terminal voltage at FAC cut-off voltage as provided by manufacturer for voltage drop calculations starting voltage. Provide a table of the total length and cable used for each audible and visual notification circuit.

CERTIFICATION: Together with the shop drawing submittal, submit a certification from the major equipment manufacturer indicating that the proposed supervisor of the installation and the proposed performer of contract maintenance is an authorized representative of the major equipment manufacturer. Include names and addresses in the certification.

OPERATION AND MAINTENANCE MANUAL: Provide two (2) copies, bound securely in durable, hard cover, water-resistant binders. Include instructions for operating and maintaining system components, assemblies, and accessories; include a detailed description of the control panel and system operation under both routine and emergency conditions. Include as-built circuit diagrams complete with conductor color codes, a parts list by name, model number, and manufacturer, and a listing of smoke detector locations, with the serial number and firing voltage for each. General system descriptions included in manufacturer's catalogs or advertising media will not be acceptable in meeting the operation and maintenance manual requirement.

TRAINING: Provide training for operating personnel in the system operation. Minimum instruction period shall be four (4) hours. Evidence of completion of training shall be included with closeout documents.



1-06 AS-BUILT DRAWINGS:

Redline construction drawings with all changes made during construction and submit to engineer. Provide up-dated shop drawings to reflect changes made during construction and provide hard copies and electronic files to the Owner.

1-07 SPARE PARTS:

Spare parts shall be directly interchangeable with the corresponding components of the installed system. Spare parts shall be suitably packaged and identified by nameplate, stamping, or tagging. Keys and locks for equipment shall be identical where possible. Furnish the following:

- a. Four keys or tools for resetting manual stations
- b. Four keys for locks of control panels or cabinets
- c. See Fire Alarm System Notes on drawings for additional items

**PART 2 - PRODUCTS**

2-01 SYSTEM DESIGN AND OPERATION:

ACCEPTABLE MANUFACTURERS: Notifier, Simplex, Gamewell/FCI, or approved equal. **Determination of any substituted system's equality shall be based upon review by the engineer and the engineer's acceptance or rejection shall be final.** Materials and equipment shall be the standard products of one manufacturer regularly engaged in the production of such equipment and shall be listed by Underwriter's Laboratories (UL).

OPERATOR CONTROL:

- a. Acknowledge Switch:
  1. Activation of the control panel acknowledge switch in response to new alarms and/or troubles shall silence the local panel piezo electric signal and change the alarm and trouble LEDs from flashing mode to steady-ON mode. If multiple alarm or trouble conditions exist, depression of this switch shall advance the LCD display to the next alarm or trouble condition.
  2. Depression of the Acknowledge switch shall also silence all remote annunciator piezo sounders.
- b. Alarm Silence Switch: Activation of the alarm silence switch shall cause all programmed alarm notification appliances and relays to return to the normal condition after an alarm condition. The selection of notification circuits and relays that are silenceable by this switch shall be fully field programmable within the confines of all applicable standards. The FACP software shall include silence inhibit and auto-silence timers.
- c. Alarm Activate (Drill) Switch: The Alarm Activate switch shall activate all notification appliance circuits. The drill function shall latch until the panel is silenced or reset.
- d. System Reset Switch: Activation of the System Reset switch shall cause all electronically-latched initiating devices, appliances or software zones, as well as all associated output devices and circuits, to return to their normal condition.
- e. Lamp Test: The Lamp Test switch shall activate all local system LEDs, light each segment of the liquid crystal display and display the panel software revision for service personal.

SYSTEM CAPACITY AND GENERAL OPERATION:

- a. The control panel or each network node shall provide, or be capable of expansion to 636 intelligent/addressable devices.
- b. The control panel or each network node shall include Form-C alarm, trouble, supervisory, and security relays rated at a minimum of 2.0 amps @ 30 VDC.
- c. It shall also include four Class B or Class A programmable Notification Appliance Circuits.
- d. The Notification Appliance Circuits shall be programmable to Synchronize with System Sensor, Gentex and Wheelock Notification Appliances.
- e. The system shall include a full featured operator interface control and annunciation panel that shall include a backlit Liquid Crystal Display (LCD), individual color coded system status LEDs, and an alphanumeric keypad with easy touch rubber keys for the field programming and control of the fire alarm system.
- f. The system shall be programmable, configurable, and expandable in the field without the need for special tools, PROM programmers or PC based programmers. It shall not require replacement of memory ICs to facilitate programming changes.
- g. The system shall allow the programming of any input to activate any output or group of outputs. Systems that have limited programming (such as general alarm), have complicated programming (such as a diode matrix), or require a laptop personal computer are not considered suitable substitutes. The FACP shall support up to 20 logic equations, including "and," "or," and "not," or time delay equations to be used for advanced programming. Logic equations shall require the use of a PC with a software utility designed for programming.
- h. The FACP or each network node shall provide the following features:
  1. Drift compensation to extend detector accuracy over life. Drift compensation shall also include a smoothing feature, allowing transient noise signals to be filtered out.
  2. Detector sensitivity test, meeting requirements of NFPA 72, Chapter 14.
  3. Maintenance alert, with two levels (maintenance alert/maintenance urgent), to warn of excessive smoke detector dirt or dust accumulation.
  4. Nine sensitivity levels for alarm, selected by detector. The alarm level range shall be .5 to 2.35 percent per foot for photoelectric detectors and 0.5 to 2.5 percent per foot for ionization detectors. The system shall also support sensitive advanced detection laser detectors with an alarm level range of .03 percent per foot to 1.0 percent per foot. The system shall also include up to nine levels of Prealarm, selected by detector, to indicate impending alarms to maintenance personnel.
  5. The ability to display or print system reports.
  6. Alarm verification, with counters and a trouble indication to alert maintenance personnel when a detector enters verification 20 times.
  7. PAS presignal, meeting NFPA 72, 23.8.1.2 and 23.8.1.3 requirements.
  8. Rapid manual station reporting (under 3 seconds) and shall meet NFPA 72 requirements for activation of notification circuits within 10 seconds of initiating device activation.
  9. Periodic detector test, conducted automatically by the software.
  10. Self optimizing pre-alarm for advanced fire warning, which allows each detector to learn its particular environment and set its prealarm level to just above normal peaks.
  11. Cross zoning with the capability of counting: two detectors in alarm, two software zones in alarm, or one smoke detector and one thermal detector.
  12. Walk test, with a check for two detectors set to same address.
  13. Control-by-time for non-fire operations, with holiday schedules.
  14. Day/night automatic adjustment of detector sensitivity.
  15. Device blink control for sleeping areas.
- i. The FACP shall be capable of coding main panel node notification circuits in March Time (120 PPM), Temporal (NFPA 72 A-2-2.2.2), and California Code. Panel notification circuits (NAC 1,2,3 and 4) shall also support Two-Stage operation, Canadian Dual Stage (3 minutes) and Canadian Dual Stage (5 minutes). Two stage operation shall allow 20 Pulses Per Minute (PPM) on alarm and 120 PPM after 5 minutes or when a second

device activates. Canadian Dual stage is the same as Two-Stage except will only switch to second stage by activation of Drill Switch 3 or 5 minute timer. The panel shall also provide a coding option that will synchronize specific strobe lights designed to accept a specific "sync pulse."

- j. Network Communication: The FACP shall be capable of communicating on a Local Area Network (LAN), a firmware package that utilizes a peer-to-peer, inherently regenerative communication format and protocol.

CENTRAL MICROPROCESSOR:

- a. The microprocessor shall be a state-of-the-art; high speed, 16-bit RISC device and it shall communicate with, monitor and control all external interfaces. It shall include an EPROM for system program storage, Flash memory for building-specific program storage, and a "watch dog" timer circuit to detect and report microprocessor failure.
- b. The microprocessor shall contain and execute all control-by-event programs for specific action to be taken if an alarm condition is detected by the system. Control-by-event equations shall be held in non-volatile programmable memory, and shall not be lost even if system primary and secondary power failure occurs.
- c. The microprocessor shall also provide a real-time clock for time annotation of system displays, printer, and history file. The time-of-day and date shall not be lost if system primary and secondary power supplies fail. The real time clock may also be used to control non-fire functions at programmed time-of-day, day-of-week, and day-of-year.
- d. A special program check function shall be provided to detect common operator errors.
- e. An auto-program (self-learn) function shall be provided to quickly install initial functions and make the system operational.
- f. For flexibility and to ensure program validity, an optional Windows(TM) based program utility shall be available. This program shall be used to off-line program the system with batch upload/download, and have the ability to upgrade the manufacturers (FLASH) system code changes. This program shall also have a verification utility, which scans the program files, identifying possible errors. It shall also have the ability to compare old program files to new ones, identifying differences in the two files to allow complete testing of any system operating changes. This shall be in compliance with the NFPA 72 requirements for testing after system modification.

SYSTEM DISPLAY:

- a. The system shall support the following display mode options: 80 character display option. The display shall include an 80-character backlit alphanumeric Liquid Crystal Display (LCD) and a full PC style QWERTY keypad.
- b. The display shall provide all the controls and indicators used by the system operator: The 80-character display shall include the following operator control switches: ACKNOWLEDGE, ALARM SILENCE, ALARM ACTIVATE (drill), SYSTEM RESET, and LAMP TEST.
- c. The display shall annunciate status information and custom alphanumeric labels for all intelligent detectors, addressable modules, internal panel circuits, and software zones.
- d. The display shall also provide Light-Emitting Diodes: The 80-character display shall provide 12 Light-Emitting-Diodes (LEDs), that indicate the status of the following system parameters: AC POWER, FIRE ALARM, PREALARM WARNING, SECURITY ALARM, SUPERVISORY SIGNAL, SYSTEM TROUBLE, DISABLED POINTS, ALARM SILENCED, Controls Active, Pre-Discharge, Discharge and Abort.
- e. The display shall have QWERTY type keypad: The 80-character display keypad shall be an easy to use QWERTY type keypad, similar to a PC keyboard. This shall be part of the standard system and have the capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels shall be provided to prevent unauthorized system control or programming.
- f. The system shall support the display of battery charging current and voltage on the 80-

character LCD display.

**SIGNALING LINE CIRCUITS (SLC):**

- a. Each FACP or FACP network node shall support up to two SLCs. Each SLC interface shall provide power to and communicate with up to 159 intelligent detectors (ionization, photoelectric or thermal) and 159 intelligent modules (monitor or control) for a loop capacity of 318 devices. The addition of the optional second loop shall double the device capacity, supporting a total of 636 devices. Each SLC shall be capable of NFPA 72 Class A or B wiring.
- b. CPU shall receive analog information from all intelligent detectors to be processed to determine whether normal, alarm, prealarm, or trouble conditions exist for each detector. The software shall automatically maintain the detector's desired sensitivity level by adjusting for the effects of environmental factors, including the accumulation of dust in each detector. The analog information shall also be used for automatic detector testing and for the automatic determination of detector maintenance requirements.

**SERIAL INTERFACES:**

- a. The system shall include two serial EIA-232 interfaces. Each interface shall be a means of connecting UL Listed Information Technology Equipment (ITE) peripherals.
- b. The EIA-485 interface may be used for network connection to a proprietary-receiving unit.

**ENCLOSURES:**

- a. The control panel shall be housed in a UL-listed cabinet suitable for surface or semi-flush mounting. The cabinet and front shall be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish.
- b. The back box and door shall be constructed of 0.060 steel with provisions for electrical conduit connections into the sides and top.
- c. The door shall provide a key lock and shall include a glass or other transparent opening for viewing of all indicators. For convenience, the door may be site configured for either right or left hand hinging.

**POWER SUPPLY:**

- a. A high tech off-line switching power supply shall be available for the fire alarm control panel or network node and provide 6.0 amps of available power for the control panel and peripheral devices.
- b. Provisions will be made to allow the audio-visual power to be increased as required by adding modular expansion audio-visual power supplies.
- c. Positive-Temperature-Coefficient (PTC) thermistors, circuit breakers, or other over-current protection shall be provided on all power outputs. The power supply shall provide an integral battery charger for use with batteries up to 55 AH or may be used with an external battery and charger system. Battery arrangement may be configured in the field.
- d. The power supply shall continuously monitor all field wires for earth ground conditions, and shall have the following LED indicators:
  1. Ground Fault LED
  2. AC Power Fail LED
  3. NAC on LED (4)
- e. The main power supply shall operate on 120 VAC, 60 Hz, and shall provide all necessary power for the FACP.
- f. The main power supply shall provide a battery charger using dual-rate charging techniques for fast battery recharge and be capable of charging batteries up to 200 AH.

- g. All circuits shall be power-limited, per UL864 requirements.

**BATTERIES:** The battery shall have sufficient capacity to power the fire alarm system for not less than twenty-four hours plus 5 minutes of alarm upon a normal AC power failure. The batteries are to be completely maintenance free. No liquids are required. Fluid level checks for refilling, spills, and leakage shall not be required. If necessary to meet standby requirements, external battery and charger systems may be used.

**AUXILIARY FIELD POWER SUPPLY – ADDRESSABLE:**

- a. The auxiliary addressable power supply is a remote 24 VDC power supply used to power Notification Devices and field devices that require regulated 24VDC power. The power supply shall also include and charge backup batteries.
- b. The addressable power supply for the fire alarm system shall provide up a minimum of 6.0 amps of 24 volt DC regulated power for Notification Appliance Circuit (NAC) power or 5 amps of 24 volt DC general power. The power supply shall have an additional .5 amp of 24 VDC auxiliary power for use within the same cabinet as the power supply. It shall include an integral charger designed to charge 7.0 - 25.0 amp hour batteries.
- c. The addressable power supply shall provide four individually addressable Notification Appliance Circuits that may be configured as two Class "A" and two Class "B" or four Class "B" only circuits. All circuits shall be power-limited per UL 864 requirements.
- d. The addressable power supply shall provide built-in synchronization for certain Notification Appliances on each circuit without the need for additional synchronization modules. The power supply's output circuits shall be individually selected for synchronization. A single addressable power supply shall be capable of supporting both synchronized and non-synchronized Notification Devices at the same time.
- e. The addressable power supply shall operate on 120 or 240 VAC, 50/60 Hz.
- f. The interface to the power supply from the Fire Alarm Control Panel (FACP) shall be via the Signaling Line Circuit (SLC) or other multiplexed means. Power supplies that do not use an intelligent interface are not suitable substitutes. The required wiring from the FACP to the addressable power supply shall be a single unshielded twisted pair wire. Data on the SLC shall be transmitted between 24 VDC, 5 VDC and 0 VDC at approximately 3.33k baud.
- g. The addressable power supply shall supervise for battery charging failure, AC power loss, power brownout, battery failure, NAC loss, and optional ground fault detection. In the event of a trouble condition, the addressable power supply shall report the incident and the applicable address to the FACP via the SLC.
- h. The addressable power supply shall have an AC Power Loss Delay option. If this option is utilized and the addressable power supply experiences an AC power loss, reporting of the incident to the FACP will be delayed. A delay time of eight or sixteen hours shall be Dip-switch selected.
- i. The addressable power supply shall have an option for Canadian Trouble Reporting and this option shall be Dip-switch selectable.
- j. The addressable power supply mounts in either the FACP backbox or its own dedicated surface mounted backbox with cover.
- k. Each of the power supply's four output circuits shall be DIP-switch selected for Notification Appliance Circuit or General Purpose 24 VDC power. Any output circuit shall be able to provide up to 2.5 amps of 24 VDC power.
- l. The addressable power supply's output circuits shall be individually supervised when they are selected to be either a Notification Appliance Circuit when wired Class "A" or by the use of an end-of-line resistor. When the power supply's output circuit is selected as General 24VDC power, the circuit shall be individually supervised when an end-of-line relay is used.
- m. When selected for Notification Appliance Circuits, the output circuits shall be individually DIP-switch selectable for Steady, March Time, Dual Stage or Temporal.
- n. When selected as a Notification Appliance Circuit, the output circuits of the addressable

- power supply shall have the option to be coded by the use of a universal zone coder.
- o. The addressable power supply shall interface and synchronize with other power supplies of the same type. The required wiring to interface multiple addressable power supplies shall be a single unshielded, twisted pair wire.
  - p. An individual or multiple interfaced addressable power supplies shall have the option to use an external charger for battery charging. Interfaced power supplies shall have the option to share backup battery power.

**FIELD CHARGING POWER SUPPLY (FCPS):** The FCPS is a device designed for use as either a remote 24 volt power supply or used to power Notification Appliances.

- a. The FCPS shall offer up to 6.0 amps (4.0 amps continuous) of regulated 24 volt power. It shall include an integral charger designed to charge 7.0 amp hour batteries and to support 60 hour standby.
- b. The Field Charging Power Supply shall have two input triggers. The input trigger shall be a Notification Appliance Circuit (from the fire alarm control panel) or a relay. Four outputs shall be available for connection to the Notification devices.
- c. The FCPS shall include an attractive surface mount backbox.
- d. The Field Charging Power Supply shall include the ability to delay the AC fail delay per NFPA requirements.

#### SPECIFIC SYSTEM OPERATIONS

- a. **Smoke Detector Sensitivity Adjust:** A means shall be provided for adjusting the sensitivity of any or all addressable intelligent detectors in the system from the system keypad. Sensitivity range shall be within the allowed UL window.
- b. **Alarm Verification:** Each of the intelligent addressable smoke detectors in the system may be independently selected and enabled to be an alarm verified detector. The alarm verification delay shall be programmable from 5 to 30 seconds and each detector shall be able to be selected for verification. The FACP shall keep a count of the number of times that each detector has entered the verification cycle. These counters may be displayed and reset by the proper operator commands.
- c. **Point Disable:** Any addressable device or conventional circuit in the system may be enabled or disabled through the system keypad.
- d. **Point Read:** The system shall be able to display or print the following point status diagnostic functions:
  - 1. Device status
  - 2. Device type
  - 3. Custom device label
  - 4. View analog detector values
  - 5. Device zone assignments
  - 6. All program parameters
- e. **System Status Reports:** Upon command from an operator of the system, a status report will be generated and printed, listing all system status.
- f. **System History Recording and Reporting:** The fire alarm control panel shall contain a history buffer that will be capable of storing up to 800 events. Up to 200 events shall be dedicated to alarm and the remaining events are general purpose. Systems that do not have dedicated alarm storage, where events are overridden by non-alarm type events, are not suitable substitutes. Each of these activations will be stored and time and date stamped with the actual time of the activation. The contents of the history buffer may be manually reviewed, one event at a time, or printed in its entirety. The history buffer shall use non-volatile memory. Systems that use volatile memory for history storage are not acceptable substitutes.
- g. **Automatic Detector Maintenance Alert:** The fire alarm control panel shall automatically

- interrogate each intelligent detector and shall analyze the detector responses over a period of time. If any intelligent detector in the system responds with a reading that is above or below normal limits, then the system will enter the trouble mode, and the particular detector will be annunciated on the system display, and printed on the optional printer. This feature shall in no way inhibit the receipt of alarm conditions in the system, nor shall it require any special hardware, special tools or computer expertise to perform.
- h. Pre-Alarm Function: The system shall provide two levels of pre-alarm warning to give advance notice of a possible fire situation. Both pre-alarm levels shall be fully field adjustable. The first level shall give an audible indication at the panel. The second level shall give an audible indication and may also activate control relays. The system shall also have the ability to activate local detector sounder bases at the pre-alarm level, to assist in avoiding nuisance alarms.
  - i. Software Zones: The FACP shall provide 100 software zones, 10 additional special function zones, 10 releasing zones, and 20 logic zones.
  - j. The fire alarm control panel shall include a walk test feature. It shall include the ability to test initiating device circuits and notification appliance circuits from the field without returning to the panel to reset the system. Operation shall be as follows:
    - 1. Alarming an initiating device shall activate programmed outputs, which are selected to participate in walk test, for 3 seconds.
    - 2. Introducing a trouble into the initiating device shall activate the programmed outputs for 8 seconds.
    - 3. All devices tested in walk test shall be recorded in the history buffer.
  - k. Waterflow Operation: An alarm from a waterflow detection device shall activate the appropriate alarm message on the main panel display, turn on all programmed notification appliance circuits and shall not be affected by the signal silence switch.
  - l. Supervisory Operation: An alarm from a supervisory device shall cause the appropriate indication on the system display, light a common supervisory LED, but will not cause the system to enter the trouble mode.
  - m. Signal Silence Operation: The FACP shall have the ability to program each output circuit (notification, relay, speaker etc) to deactivate upon depression of the signal silence switch.
  - n. Non-Alarm Input Operation: Any addressable initiating device in the system may be used as a non-alarm input to monitor normally open contact type devices. Non-alarm functions are a lower priority than fire alarm initiating devices.
  - o. Combo Zone: A special type code shall be available to allow waterflow and supervisory devices to share a common addressable module. Waterflow devices shall be wired in parallel, supervisory devices in series.

2-03 COMPONENT DESIGN:

**MAIN FIRE ALARM CONTROL PANEL:** Main FACP or network node shall be a NOTIFIER Model NFS2-640, SIMPLEX 4100ES, or GAMEWELL/FCI E3 Series and shall contain a microprocessor based Central Processing Unit (CPU) and power supply in an economical space saving single board design. The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, printer, annunciators, and other system controlled devices. The FAC panel shall be networkable and shall include the manufacturer's fiber-ready network option. The FAC panel shall be capable of having voice evacuation added as an option. The FAC panel shall be capable of having firefighter's telephones added as an option.. The FAC shall bear the name of the manufacturer.

FURNISH & INSTALL SYSTEM SMOKE DETECTORS AT ALL FIRE ALARM CONTROL PANEL LOCATIONS, REMOTE FIRE ALARM ANNUNCIATOR LOCATIONS, AND ALL POWER SUPPLY LOCATIONS REGARDLESS OF WHETHER OR NOT THEY ARE SHOWN ON THE DRAWINGS.

The panel shall be UL listed as a test instrument for the measurement of the sensitivity of connected intelligent analog ionization and photoelectric smoke detectors to comply with the testing requirements of NFPA 72.

**ALARM SEQUENCE:** The activation of any system smoke detector shall initiate an Alarm Verification operation whereby the panel will reset the activated detector and wait for a second alarm activation. If, within one (1) minute after resetting, a second alarm is reported from the same or any other smoke detector, the system shall process the alarm as described previously. If no second alarm occurs within one minute the system is to resume normal operation. The Alarm Verification is to operate only on smoke detector alarms. Other activated initiating devices shall be processed immediately. The alarm verification operation is to be selectable by device.

**ALPHANUMERIC LCD TYPE REMOTE FIRE ALARM ANNUNCIATOR (FAA):** Mount with panel top 54 inches above finished floor elevation. Annunciator shall duplicate annunciation functions performed by the main control panel. Fire alarm device descriptions shall correspond to the fire alarm control panel device descriptions. Panel shall be flush mounted. Provide flush mount backbox as required. Field verify the remote annunciator location with the local building official prior to rough-in.

- a. The alphanumeric display annunciator shall be a supervised, remotely located back-lit LCD display containing a minimum of eighty (80) characters for alarm annunciation in clear English text.
- b. The LCD annunciator shall display all alarm and trouble conditions in the system.
- c. An audible indication of alarm shall be integral to the alphanumeric display.
- d. The display shall be UL listed for fire alarm application.
- e. It shall be possible to connect up to 32 LCD displays and be capable of wiring distances up to 6,000 feet from the control panel.
- f. The annunciator shall connect to a separate, dedicated "terminal mode" EIA-485 interface. This is a two-wire loop connection and shall be capable of distances to 6,000 feet. Each terminal mode LCD display shall mimic the main control panel.
- g. The system shall allow a minimum of 32 terminal mode LCD annunciators. Up to 10 LCD annunciators shall be capable of the following system functions: Acknowledge, Signal Silence and Reset, which shall be protected from unauthorized use by a keyswitch or password.
- h. The LED annunciator shall offer an interface to a graphic style annunciator and provide each of the features listed above.

**UNIVERSAL DIGITAL ALARM COMMUNICATOR TRANSMITTER (UDACT):** The UDACT is an interface for communicating digital information between a fire alarm control panel and an UL-Listed central station. Furnish and install a digital communicator for transmission of fire alarm signals to a remote monitoring facility via telephone lines. The digital communicator shall conform to UL 864 and NFPA 71 requirements, and shall be UL listed. The communicator shall be capable of transmitting the status of software zones (alarm & trouble), system trouble, panel off-normal, supervisory, bell trouble, low battery, and AC fail, and shall be compatible for use with the Fire Alarm Control Panel. The communicator shall have the capability of supervising two telephone lines, and of seizing the telephone lines and sending an alarm signal on one or both lines without the need for additional equipment. The communicator shall sound a local trouble alarm and transmit a signal to the fire alarm control panel if telephone service is interrupted on either line for more than 45 seconds and simultaneously transmit a signal to both the central monitoring station and the control panel when telephone service is restored. The communicator shall be capable of sending a test signal to the central monitor station every 24 hours at any specific time of day or night by setting a program within the communicator. Alarm signals to the central monitor station



shall indicate which of the communicator transmitter initiating device circuits are in trouble and which are in alarm. Restoration to normal shall also be transmitted to the central monitor station.

- a. The UDACT shall be compact in size, mounting in a standard module position of the fire alarm control cabinet. Optionally, the UDACT shall have the ability for remote mounting, up to 6,000 feet from the fire alarm control panel. The wire connections between the UDACT and the control panel shall be supervised with one pair for power and one pair for multiplexed communication of overall system status. Systems that utilize relay contact closures are not acceptable.
- b. The UDACT shall include connections for dual telephone lines (with voltage detect), per UL/NFPA/FCC requirements. It shall include the ability for split reporting of panel events up to three different telephone numbers.
- c. The UDACT shall be completely field programmable from a built-in keypad and 4 character red, seven segment display.
- d. The UDACT shall be capable of transmitting events in at least 15 different formats. This ensures compatibility with existing and future transmission formats.
- e. Communication shall include vital system status such as:
  - Independent Zone (Alarm, trouble, non-alarm, supervisory)
  - Independent Addressable Device Status
  - AC (Mains) Power Loss
  - Low Battery and Earth Fault
  - System Off Normal
  - 12 and 24 Hour Test Signal
  - Abnormal Test Signal (per UL requirements)
  - EIA-485 Communications Failure
  - Phone Line Failure
- f. The UDACT shall support independent zone/point reporting when used in the Contact ID format. In this format the UDACT shall support transmission of up to 2,040 points. This enables the central station to have exact details concerning the origin of the fire or response emergency.

Provide 2-line telephone surge protector for incoming DACT telephone lines. Surge protector shall be DiTek DTK-MRJ31XSCP-RUV, or approved equivalent of Innovative Technology, EPT, MCG Electronics, or APC. Unit shall be listed per UL 497A, rated for 130 volts, 9000 amps, 76 joules, with a 5 nanosecond response time. Unit shall be provided with RJ45 modular plugs.

#### 2-04 NOTIFICATION APPLIANCES

**SYNCHRONIZED STROBE AUDIO VISUAL ALARMS:** UL Listed to Standard 1971 and tested for 75 candela on-axis. Semi-flush mounted combination horn-lamp assembly suitable for use on an electrically supervised circuit. Horn shall be electronic type with a 3-pulse temporal audible signal and shall have a sound rating of 88db at 10 ft, and shall include a minimum of three settings (high/medium/low). All horns in corridors and in spaces larger than 2,000sf shall be set to "high". All other horns shall be set to "low". Lamps shall be synchronized flashing Xenon type with field selectable 15/30/75/110 candela effective intensity and a flash rate of 1 Hz, and shall be protected by a clear plastic lens. The housing shall be finished in textured **red** plastic with "FIRE" marked thereon in **white**. Provide flush-mount backboxes as required. Strobe setting to be as indicated on the drawings.

**SYNCHRONIZED STROBE VISUAL ALARMS:** UL Listed to Standard 1971 and tested for 75 candela on-axis. Semi-flush mounted. Lamps shall be synchronized flashing Xenon type with field selectable 15/30/75/110 candela effective intensity and a flash rate of 1 Hz, and shall be protected by a clear plastic lens. The housing shall be finished in textured **red** plastic with "FIRE" marked

thereon in **white**. Provide flush-mount backboxes as required. Strobe setting to be as indicated on the drawings.

**SYNCHRONIZATION CONTROL MODULES (SCM):** Provide SCM's as required to synchronize all strobes and horns on each notification appliance circuit. Furnish, install, and wire the SCM's per the manufacturer's recommendations.

**SPARE CAPACITY:** All Notification Appliance Circuits shall be designed with a minimum of 20% spare capacity to allow for future devices.

## 2-05 INITIATING DEVICES

There shall be no limit to the number of detectors, stations, or modules that may be activated or "in alarm" simultaneously. Detectors shown connected to magnetic door holders or other similar devices shall be furnished with 120V auxiliary SPDT contacts for release of the devices when the detectors are actuated. Detectors shall be suitable for operation on 24V DC power.

**INTELLIGENT MANUAL STATIONS:** Provide noncoded type with mechanical reset features. Stations shall be semiflush mounted with the base at 48 inches above the finished floor to the top. The manual stations shall be addressable and identifiable by the master fire alarm control panel. Address assignments shall be set electronically and reside within the station in non volatile memory. Addressable pull stations shall contain electronics that communicate the station's status (alarm or normal) to the control panel over two wires that also provide power to the pull station. The stations will be manufactured from high impact red Lexan. Lettering will be raised and painted white. The station will mechanically latch upon operation and remain so until manually reset by opening with a key. Pull stations shall be dual action. The front of the station is to be hinged to a backplate assembly and must be opened with a key to reset the station. The addressable manual station shall be capable of field programming of its "address" location on an addressable signaling line circuit. Stations indicated as weatherproof shall be installed in cast metal, weatherproof housings with side-hinged access doors.

**INTELLIGENT MULTI-SENSOR TYPE FIRE DETECTORS:** UL 268. Low profile multi-sensor type detectors shall be plug-in units that mount to a twist-lock base. The intelligent multi-criteria detector shall be an addressable device that is designed to monitor a minimum of photoelectric and thermal technologies in a single sensing device. The design shall include the ability to adapt to its environment by utilizing a built-in microprocessor to determine its environment and choose the appropriate sensing settings. The detector design shall allow a wide sensitivity window, no less than 1 to 4% per foot obscuration. This detector shall utilize advanced electronics that react to slow smoldering fires and thermal properties all within a single sensing device. The microprocessor design shall be capable of selecting the appropriate sensitivity levels based on the environment type it is in (office, manufacturing, kitchen etc.) and then have the ability to automatically change the setting as the environment changes (as walls are moved or as the occupancy changes). The intelligent multi criteria detection device shall include the ability to combine the signal of the thermal sensor with the signal of the photoelectric signal in an effort to react hastily in the event of a fire situation. It shall also include the inherent ability to distinguish between a fire condition and a false alarm condition by examining the characteristics of the thermal and smoke sensing chambers and comparing them to a database of actual fire and deceptive phenomena. No radioactive material shall be used. Provide a separate mounting base with terminal screws for all wiring connections. Base shall be capable of mounting on standard 4" square back box for flush mounting or special box for surface mounting. Detector shall be polled and shall report "Normal", "Alarm", or "Trouble" condition to the control panel. A detector disconnected from the base shall indicate a "Trouble" condition. Detector shall utilize an LED that blinks when device is polled and glows steady when device is in alarm.

INTELLIGENT PHOTOELECTRIC TYPE DUCT SMOKE DETECTORS: UL 268A. Detectors in ducts shall comply with UL requirements for sensing of products of combustion in air handling/duct systems for each air handler. Provide power on LED and relay for AHU shut down. The relay must be capable of being logically controlled independent of the detector head. To minimize nuisance alarms, detectors shall have an insect screen and be designed to ignore invisible particles or smoke densities that are below the factory set point. No radioactive material shall be used. The 24VDC intelligent analog duct detector shall communicate actual smoke chamber values to the system control. For maintenance purposes, it shall be possible to clean the duct housing sampling tubes by accessing them through the duct housing front cover. Provide a remote indicator with integrated key-activated remote test station for each duct smoke detector.

Duct Detectors shall be furnished by the Fire Alarm System Contractor, installed by the HVAC Contractor. Wiring for the Fire Alarm System shall be furnished and installed by the Fire Alarm System Contractor. Keyed Test Station and Alarm Light to be furnished and installed by the Fire Alarm System Contractor. Wiring for HVAC control/shutdown shall be furnished and installed by the Mechanical Contractor. Coordinate in field prior to rough-in as required. Refer to manufacturer's installation instructions prior to installing duct smoke detectors and coordinate the location of each duct detector with the Mechanical Contractor prior to rough-in to insure compliance with the manufacturer's requirements. See fire alarm notes for location and testing of duct mounted smoke detectors.

INTELLIGENT HEAT DETECTORS: UL 521.

- a. Combination Rate of Rise Type: Detector shall be semi-flush mounted intelligent addressable device rated at 135 degrees Fahrenheit (58 degrees Celsius) and have a rate-of-rise element rated at 15 degrees F (9.4 degrees C) per minute. No detector shall be located closer than 12" to any part of any light fixture. Detector shall be automatically restorable and shall have tamper resistant design. Provide a separate mounting base with terminal screws for all wiring connections. Base shall be capable of mounting on standard 4" square back box for flush mounting or special box for surface mounting. Detector shall be polled and shall report "Normal", "Alarm", or "Trouble" condition to the control panel. A detector disconnected from the based shall indicate a "Trouble" condition. Detector shall utilize an LED that blinks when device is polled and glows steady when device is in alarm.
- b. Fixed Temperature Type: Detector shall be semi-flush mounted intelligent addressable device rated at 135 degrees Fahrenheit (58 degrees Celsius) for standard and 190 degrees Fahrenheit (88 degrees Celsius) for high temperature. No detector shall be located closer than 12" to any part of any light fixture. Detector shall be automatically restorable and shall have tamper resistant design. Provide a separate mounting base with terminal screws for all wiring connections. Base shall be capable of mounting on standard 4" square back box for flush mounting or special box for surface mounting. Detector shall be polled and shall report "Normal", "Alarm", or "Trouble" condition to the control panel. A detector disconnected from the based shall indicate a "Trouble" condition. Detector shall utilize an LED that blinks when device is polled and glows steady when device is in alarm.

MAGNETIC DOOR HOLDERS: Low profile, concealed wiring type, 24VDC/120VAC. Tie in to smoke detectors as indicated on the drawings. Provide one addressable output module per door holder. Provide extension arms where required for proper door holder function.

INTELLIGENT MONITORING MODULES: Monitoring Modules (MMs) shall be used for monitoring systems including but not limited to: waterflow, valve tamper, Halon/Clean Agent Control Panels, fire pump controllers, kitchen hood fire suppression systems, and non-addressable detectors. .

Modules shall be capable of mounting in a standard electric outlet box and shall include cover plates to allow surface or flush mounting. Each Module shall be supervised and uniquely identified by the control panel. Device identification shall be transmitted to the control panel for processing according to the program instructions. Should a Module become non-operational, tampered with, or removed, a discrete trouble signal, unique to the device, shall be transmitted to, and annunciated at, the control panel. Modules shall be capable of being programmed for "address" location on the addressable device signaling line circuit, and shall be compatible with addressable manual stations and addressable detectors on the same addressable circuits. Modules shall be cable of field assignable personality codes based upon monitoring point type.

**INTELLIGENT CONTROL MODULES:** Control Modules (CMs) shall be used for controlling systems including but not limited to AHU systems, elevator controllers, smoke damper controls and electrically operated door controls. Modules shall be capable of mounting in a standard electric outlet box and shall include cover plates to allow surface or flush mounting. CMs shall receive their 24VDC power from a separate two wire pair running from an appropriate power supply. Each Module shall be supervised and uniquely identified by the control panel. Device identification shall be transmitted to the control panel for processing according to the program instructions. Should a Module become non-operational, tampered with, or removed, a discrete trouble signal, unique to the device, shall be transmitted to, and annunciated at, the control panel. Modules shall be capable of being programmed for "address" location on the addressable device signaling line circuit, and shall be compatible with addressable manual stations and addressable detectors on the same addressable circuits. Control modules shall contain form "C" contacts rated at 2A, 24VDC and 0.5A, 120VAC. Where the device being controlled requires higher contact current ratings, provide heavy duty relays with proper contact ratings slaved from an output module on a supervised control circuit. Coordinate with controlled device for contact voltage and current ratings.

2-06 WIRE

**WIRING:** Furnish and install in accordance with NFPA 70 and NFPA 72. Wiring shall be in accordance with local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Conductors for 120-volt circuits shall be No. 12 AWG minimum. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for Initiating Device Circuits and Signaling Line Circuits, and 14 AWG (1.63 mm) for Notification Appliance Circuits. Identify conductors within each enclosure where a tap, splice, or termination is made. Identify conductors by plastic-coated, self-sticking, printed markers or by heat-shrink type sleeves. Wire the alarm initiating and notification signal devices so that removal will cause the system trouble device to sound. Pigtail or "T" tap connections to evacuation alarm bells, horns, and fire warning lights are not acceptable. Each conductor used for the same specific function shall be distinctively color coded. Each circuit color code wire shall remain uniform throughout circuit.

- a. All fire alarm system wiring shall be new (verify all fire alarm system wiring requirements with the equipment manufacturer prior to starting work). Conductors shall be copper.
- b. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
- c. Wiring used for the multiplex communication circuit (SLC) shall be twisted and unshielded and support a minimum wiring distance of 12,500 feet. The design of the system shall permit use of IDC and NAC wiring in the same conduit with the SLC communication circuit.
- d. All field wiring shall be electrically supervised for open circuit and ground fault.
- e. The fire alarm control panel shall be capable of t-tapping Class B Signaling Line Circuits (SLCs). Systems that do not allow or have restrictions in, for example, the amount of t-taps, length of t-taps etc., are not acceptable.
- f. Wire installed outside shall be U.L. listed for specific installation type.

Wiring types will be approved by the equipment manufacturer. The system must allow up to 2,500 feet wire length to the furthest addressable device. Class A communications will be provided where shown on the drawings. Wire and conduit will be routed to maintain sufficient distance between the forward and return loop as called for by the authority having jurisdiction. Class B communications will be provided where shown on the drawings.

Where NFPA 72 requires a pathway survivability of 2 or greater for fire alarm, the use of fire resistive cables listed for the application is acceptable. Other listed systems for pathway survivability may be used only after approval from the AHJ and engineer.

Use solid conductors with 600V Type THHN-THWN-MTW insulation for systems operating at 120V, and 300V Type TF insulation for systems operating at low voltage (24V or less). Stranded wire may be used if Sta-Con connectors are used at all screw terminals.

#### 2-07 RACEWAYS

Galvanized rigid conduit (GRC) or Intermediate grade metallic conduit (IMC) with screwed fittings, or Electrical metallic tubing (EMT) with compression type fittings or all-steel set screw fittings. See Section 260500, Basic Materials and Methods.

All circuits shall be in metal conduit, unless noted otherwise. All raceways shall be run concealed in walls or ceilings in EMT, GRC, or IMC, unless noted otherwise. Where surface raceway is required and is approved in writing by the Architect and the Owner, use Wiremold ivory surface metal raceway with red surface metal boxes compatible with fire alarm devices, except that EMT with steel boxes may be used in storage rooms, etc. requiring surface raceway. No high voltage wiring will be permitted in the same raceway or electrical box with any wiring of the fire alarm system except where there is a direct interface such as programmable relay controlling an external device. Where this occurs, the box must be clearly marked to indicate the presence of high voltage.

#### 2-08 PATHWAY SURVIVABILITY

Refer to NFPA 72 for pathway survivability requirements of each alarm and communication circuit for the fire alarm system and area of refuge system. Provide rated cable or other system approved by the AHJ and the engineer to achieve pathway survivability ratings.

### PART 3 - INSTALLATION

#### 3-01 WORKMANSHIP

All work shall be installed in a neat and orderly manner. Devices, cabinets, covers, fixtures, exposed raceways, etc., shall be aligned parallel or perpendicular to the building walls, ceiling and floor. Wiring in panelboards and cabinets shall be neatly looped and laced, and not wadded. The Owner reserves the right to require repair or replacement of defective workmanship and material without additional compensation to the Contractor.

#### 3-02 SUPPORTS

Conduits, boxes, cabinets, enclosures, etc., shall be securely supported by structural members or structural walls at intervals required by the NEC or as recommended by the manufacturer. Plaster, gypsum board, acoustical tile, and other ceiling and wall finish material shall not be used for support.

#### 3-03 MANUFACTURER'S REPRESENTATIVE

The services of a qualified manufacturer's representative or technician, experienced in the installation, operation, testing, and servicing of the type of system being installed, shall supervise

the installation, connecting, software documentation, testing, and adjusting of the system, and train the Owner's personnel in operation of the system. Certified test reports of the final satisfactory test shall be submitted to the Architect-Engineer.

### 3-04 CONDUIT AND WIRING IDENTIFICATION

See Section 260500, Basic Materials and Methods. All wiring shall be run in EMT, GRC, or IMC conduit. All junction box covers shall be spray painted red and labeled "Fire Alarm". Conductors shall be color coded as follows:

Red/Black	Indicating Circuits (Horns/lights)
Blue/Yellow	Manual Initiating Circuits (Different zones shall be numbered)
Brown/Orange	Automatic Initiating Circuits (Different zones shall be numbered)
White/Green	Do Not Use

### 3-05 INITIATING AND INDICATING DEVICES

Initiating and indicating devices shall be SECURELY installed as indicated on the drawings and connected in accordance with the applicable wiring diagrams. The contractor shall clean all dirt and debris from the inside and outside of the fire alarm equipment after completion of the installation. The smoke detection devices shall be covered with plastic bags or hard covers in accordance with the manufacturer's recommendations after installation to maintain cleanliness. The bags/covers shall be red for quick visual identification for removal at time of occupancy.

### 3-06 TESTS

Upon completion of work, the entire system shall be completely operational and tested for conformance with these specifications and drawings, and reviewed by the Architect-Engineer. Test shall be performed in accordance with the fire alarm system manufacturer's instructions and per NFPA 72 requirements. All defects in workmanship and material shall be immediately corrected without additional compensation to the Contractor.

**SMOKE DETECTOR TESTS:** Prior to formal review and tests, clean and perform operational test on each smoke detector. Clean the smoke detectors in accordance with the manufacturers recommended procedures.

**DUCT MOUNTED SMOKE DETECTOR TESTS:** Prior to formal review and tests, clean and perform operational test on each smoke detector. Clean the smoke detectors in accordance with the manufacturers recommended procedures. Provide documentation of duct detector testing per NFPA 72 Table 14.4.2.2-14(g)(6). Air duct detectors shall be tested or inspected to ensure that the device will sample the airstream. The test shall be made in accordance with the manufacturer's published instructions.

**FIELD REVIEW AND TEST:** Before final acceptance of the work, test each system to demonstrate compliance with the contract requirement. Each system shall be subjected to complete functional and operational tests including tests in place of each heat and smoke detector (smoke testing aerosols containing oil are NOT acceptable). When tests have been completed and corrections made, submit a signed and dated certificate with a request for formal review and tests.

**FORMAL REVIEW AND TEST:** The Engineer will witness formal tests after receipt of written certification that preliminary tests have been completed and that the system is ready for final review. The system manufacturer's technical representative shall be present for the final review and test. Preliminary tests shall be repeated and functional and operational tests conducted, as requested by

the Engineer. Correct defects and conduct additional tests to demonstrate that the system conforms to contract specifications.

RECORD OF COMPLETION: Complete and submit the NFPA-72 Record of Completion form.

3-07 INSTRUCTION

Instruction shall be provided as required for operating the system. Hands-on demonstrations of the operation of all system components and the entire system including program changes and functions shall be provided.

The contractor and/or the systems manufacturer's representatives shall provide a typewritten "Sequence of Operation."

3-08 RECORD OF SYSTEM PROGRAMMING

Provide to the owner a printout of the system programming and DVD disk containing a copy of the program. DVD shall contain all manufacturer software necessary for system maintenance and/or adds and deletes of devices/equipment.

3-09 CLEAN-UP

Upon completion of all installations and prior to final acceptance by the Owner, all debris shall be removed from the site. Cabinets, enclosures, cover plates, etc., shall be cleaned and paint touched up.

END OF SECTION 283100





## **Hazardous Materials Assessments**



**LIMITED LEAD-BASED PAINT  
INVESTIGATION**

**USC 1600 HAMPTON STREET ANNEX  
#29a  
1600 HAMPTON STREET  
COLUMBIA, SOUTH CAROLINA**

**REPORT PREPARED FOR:**



**UNIVERSITY OF  
SOUTH CAROLINA**

**UNIVERSITY OF SOUTH CAROLINA  
743 Green Street  
Columbia, South Carolina 29208**

**BY:**

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**September 3, 2013**

**E5300.12**

## TABLE OF CONTENTS

I. Executive Summary.....	1
II. LBP Background Information .....	2
III. Introduction .....	2
IV. Investigation Results.....	3
V. Recommendations .....	3

### APPENDIX A

- Site Vicinity Map (Figure 1)
- General Building Plan (Figure 2)
- XRF Data (Table I)
- Photographs of Positive Lead-Based Paint Items

### APPENDIX B

- Personnel Certification

### APPENDIX C

- SCDHEC Lead-Based Paint Disposal Fact Sheets

## I. EXECUTIVE SUMMARY

As requested, F&ME Consultants has completed a Limited Lead-Based Paint (LBP) investigation of the University of South Carolina's 1600 Hampton Street Annex building (#29a) located at 1600 Hampton Street in Columbia, South Carolina. This limited investigation was performed on August 7<sup>th</sup> and 8<sup>th</sup>, 2013.

It is our understanding that the existing building is scheduled for a complete interior renovation. For this reason, the scope of this limited LBP investigation was to identify, analyze and assess the condition of lead-based painted or coated building components associated with the interior that may be affected by the planned renovation activities. This scope includes both a visual evaluation of the physical condition of painted materials as well as quantitative testing of random surfaces using a Thermo Scientific Niton X-Ray Fluorescence (XRF) Portable Analyzer. The XRF documents the concentration of lead, if any, in the overall paint or coating. Positive results indicate that LBP is present in concentrations that equal or exceed the threshold of 0.7 mg/cm<sup>2</sup>. This threshold is based on the South Carolina Department of Health and Environmental Control's (SCDHEC) requirement to use specialized waste disposal sites for the disposal of lead painted/coated building components containing lead at concentrations  $\geq 0.7$  mg/cm<sup>2</sup>. However, OSHA considers paint having **any** measurable level of lead to be a substantial exposure hazard during construction work, depending upon the work performed.

The results from the XRF quantitative testing indicate that lead is present on components associated with the subject building structure. The following components were found to have LBP: original structural steel beams and columns; porcelain sinks in the bathrooms; ceramic wall tiles in the bathrooms on the third floor; stair stringers, risers, balusters, and newel posts in all stairways; paint on the edge of the steps and on the wooden baseboards in stairwell ST02; outer door for elevator EV01 on all floors; and the yellow-painted elevator walls and ceiling on service elevator EV02.

The XRF test results are organized in Table I, which includes the location, description and type of building material from which the readings were taken (see Appendix A). The General Building Plan (Figure 2) includes the subject building's layout and area/room numbering, as well as the "side" designations for the subject building as listed in Table I.

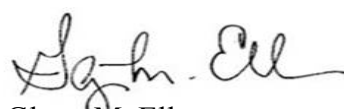
We sincerely appreciate the opportunity to assist you with this project. If you have any questions or require any additional information, please do not hesitate to contact our office at (803) 254-4540.

Sincerely,

F&ME CONSULTANTS



Jeffrey S. Leary  
S.C. Lead-Based Paint Inspector  
EPA Cert. No. SC-I-18721-2 (Exp. 07/29/15)



Glynn M. Ellen  
Senior Environmental Professional

## II. LBP BACKGROUND INFORMATION

Housing and Urban Development (HUD) defines “lead-based paint” as any coating that has a lead concentration of 1.0 milligrams of lead per square centimeter ( $1.0 \text{ mg/cm}^2$ ) or greater, or if the lead concentration is greater than 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 lead-based paint 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 the Occupational Safety and Health Administration (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 ( $50 \text{ } \mu\text{g/m}^3$ ) averaged over an 8-hour period.

Additionally, the SCDHEC requires the use of specialized waste disposal sites if materials contain lead concentrations at or exceeding  $0.7 \text{ mg/cm}^2$ . Due to the anticipated impact on the building’s components from the planned renovation activities, the SCDHEC lead disposal requirement was used as our project threshold.

## III. INTRODUCTION

As requested, F&ME Consultants has completed a Limited Lead-Based Paint (LBP) investigation of the University of South Carolina’s 1600 Hampton Street Annex building (#29a) located at 1600 Hampton Street in Columbia, South Carolina. This limited investigation was performed on August 7<sup>th</sup> and 8<sup>th</sup>, 2013.

It is our understanding that the existing building is scheduled for a complete interior renovation. For this reason, the scope of this limited LBP investigation was to identify, analyze and assess the condition of lead-based painted or coated building components associated with the interior that may be affected by the planned renovation activities.

The results, conclusions and recommendations from this limited investigation are representative of the conditions observed at the site on the date(s) of the field inspection. F&ME does not assume responsibility for any changes in conditions or circumstances that occur after the inspection. Use of this document for bidding purposes is not recommended without prior consultation with F&ME. No other environmental issues are addressed in this report.

## IV. INVESTIGATION RESULTS

The subject building is a four-story concrete and steel structure with steel columns, steel trusses and poured-in-place concrete flooring. Interior finishes include “furred out” drywall walls over original plaster walls, masonry block walls, a suspended ceiling system, floor tiles, ceramic tiles, carpeting, and exposed concrete flooring. Exterior finishes include textured concrete walls and a flat built-up roof. See the General Building Plan (Figure 2) in Appendix A for the building’s layout.

Our LBP investigation sampling protocol consisted of randomly selecting building components within the interior of the subject building and scanning them with our Thermo Scientific Niton X-Ray Fluorescence (XRF) Portable Analyzer (Model XLp300A, Serial #18185, Isotope 1: Cd109, 40mCi, source date 11/15/2011) using the threshold of 0.7 mg/cm<sup>2</sup>. The interior components that were tested with the XRF include the following: structural beams, columns, and joists; interior walls; ceilings; interior and exterior doors and door components; interior and exterior windows and window components; flooring; porcelain sinks, toilets, and urinals; ceramic tiles; painted baseboards; stairwell components, etc. For more information regarding the specific descriptions and locations of the items that were tested, refer to the XRF Data (Table I) located in the appendix.

The XRF results indicate that LBP is present in the subject structure. The components found to contain LBP include the following: original structural steel beams and columns; porcelain sinks in the bathrooms; ceramic wall tiles in the bathrooms on the third floor; stair stringers, risers, balusters, and newel posts in all stairways; paint on the edge of the steps and on the wooden baseboards in stairwell ST02; outer door for elevator EV01 on all floors; and the yellow-painted elevator walls and ceiling on service elevator EV02.

As noted above, some components associated with particular areas were found to contain lead, while the same components in other areas were found to be free of lead. For example, ceramic wall tiles were observed in restrooms on all floors; however, the only bathroom with lead-containing tiles was determined to be on the third floor. Additionally, the only steps found to have LBP were located in stairwell ST02.

The appendices include a Site Vicinity Map (Figure 1), a General Building Plan (Figure 2), the XRF Data (Table I), Photographs of Positive Lead-Based Paint Items, Personnel Certification, and SCDHEC Lead-Based Paint Disposal Fact Sheets.

## V. RECOMMENDATIONS

As reported herein, lead-based paints and/or coatings were identified on interior building components that may be affected by the planned renovation activities. If components found to contain LBP are to be removed as part of the renovation, it is recommended that these components are separated from general renovation waste and disposed of as LBP waste. However, certain lead-coated building components that can be removed intact, such as porcelain bathroom sinks, are accepted at most construction and demolition (C&D) landfills.

Additionally, renovation activities associated with LBP-painted surfaces that will disturb the coating (i.e. scraping, sanding, or cutting) must be performed in accordance with all applicable federal, state and local regulations and guidelines requiring lead-safe work practices to prevent the creation of lead dust. Lead-based painted/coated materials must be removed without creating appreciable

amounts of dust and disposed of in an SCDHEC-approved landfill. This special care is intended to prevent exposure of the workers to lead via inhalation of lead-contaminated dust. All LBP removal should be performed by certified personnel experienced in removing, handling and properly disposing of LBP. OSHA and EPA regulations list the proper means and methods to be used when handling items containing lead-based paint.

In South Carolina, construction/ demolition waste containing LBP is required to be deposited at an SCDHEC-certified Municipal Solid Waste Landfill (MSWLF) when the total lead level exceeds 0.06% by weight (>600 ppm), and/or XRF results are  $\geq 0.7 \text{ mg/cm}^2$ . If any of the positive identified items are to be demolished in-place (i.e. not removed intact prior to general renovation), the presence of LBP may require the resulting demolition debris to be disposed of in an MSWLF which accepts lead-contaminated construction and demolition (C&D) waste at a higher cost than a normal C&D landfill. Metal components painted with and/or contain lead may be recycled if they are taken to a recycling facility that accepts lead painted and/or lead containing material.

The health risk associated with lead comes from the inhaling, ingesting or drinking lead contaminated items. In some cases if the lead has not been aerosolized, and is not chipping or flaking, there may be minimal risk to people. It is when lead containing items are disturbed or begin to decay that they typically pose the greatest risk to a person's health and become more of an environmental hazard.

Special care and procedures are to be used when handling any of the items that tested positive for lead. Using proper Personnel Protection Equipment (PPE) and proper hygiene when working with items that contain lead are a must. The type of procedures and handling depend on whether the item and/or items are going to be removed or renovated. As stated before, OSHA 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 ( $50\text{ug/m}^3$ ) averaged over an 8-hour period.

As previously stated, this LBP investigation included the analysis of randomly-selected painted or coated building components associated with the specified areas of the subject structure. **Due to this random selection method, there may be items with lead-based paint or coating(s) that were not tested.** For the purposes of this investigation, untested components that are similar to tested components in material, age, color, and use will be assumed positive or negative based upon the XRF results and should be handled in accordance with OSHA, EPA and SCDHEC guidelines. Therefore, the items that tested positive for lead should be handled as lead-based paint containing materials to ensure compliance with regulatory requirements. However, in the event that untested building components and/or equipment are to be directly affected by renovation activities, direct testing must be performed to determine definitively whether or not LBP is present.

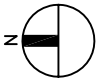
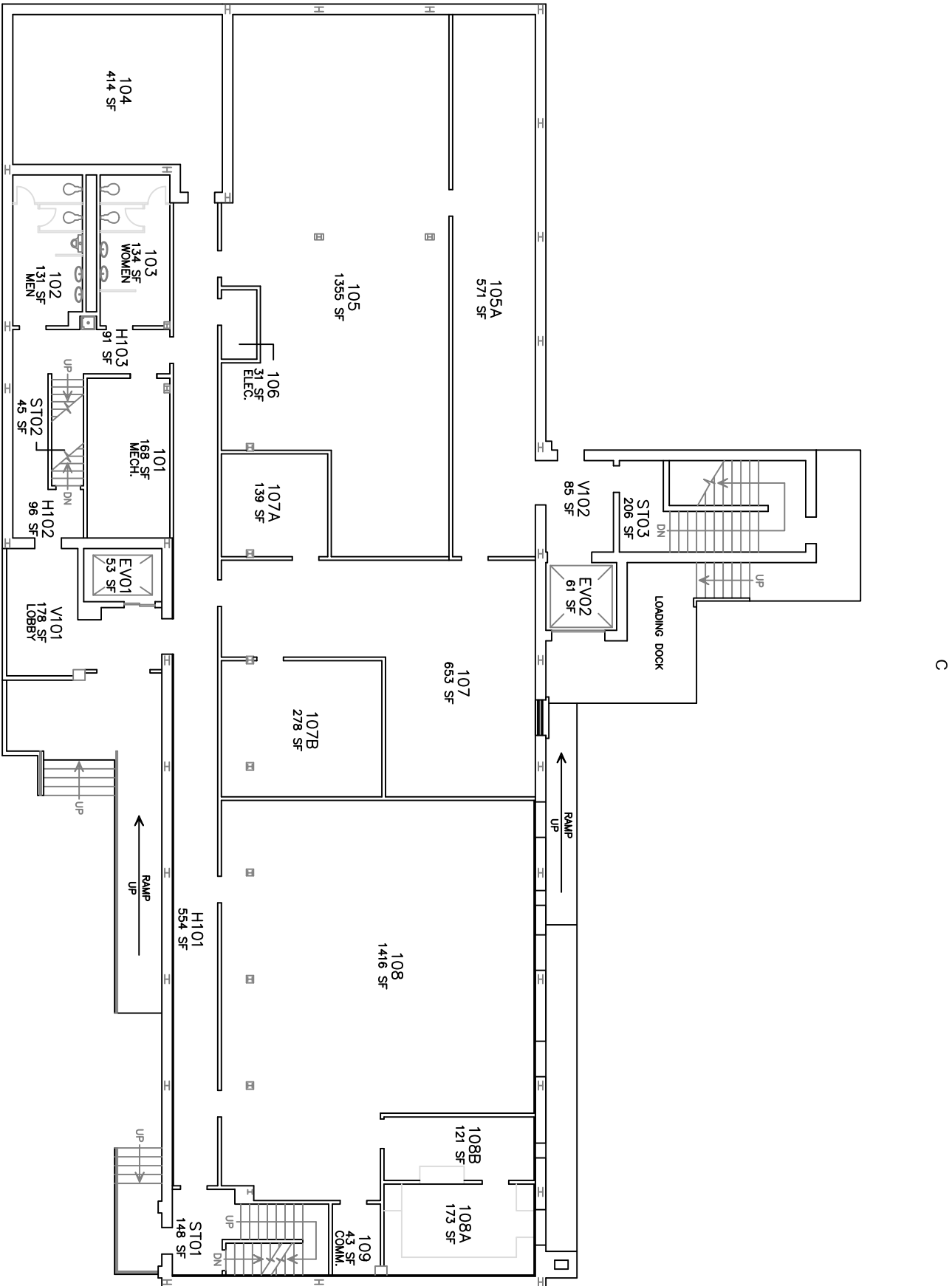
This report has been prepared exclusively for the University of South Carolina and shall not be disseminated in whole or part to other parties without prior consent from the University of South Carolina, or F&ME Consultants, Inc. Use of this document for bidding purposes is not recommended without prior consultation with F&ME.



## **APPENDIX A**

Site Vicinity Map (Figure 1)  
General Building Plan (Figure 2)  
XRF Data (Table I)  
Photographs of Positive Lead-Based Paint Items





FIRST FLOOR PLAN – 029A

SCALE: 1/16" = 1.0'



**Table I. XRF Data**  
**USC 1600 Hampton Street Annex (#29a)**  
**Date Analyzed: 08/07,08/2013**

READING NO.	COMPONENT	SUBSTRATE	SIDE	CONDITION	COLOR	ROOM	FLOOR	RESULTS	ACTION LEVEL (mg/cm <sup>2</sup> )	PbC (mg/cm <sup>2</sup> )
1		Shutter Calibrate								NA
2			Calibrate					Positive	0.7	0.7
3			Calibrate					Positive	0.7	0.7
4			Calibrate					Positive	0.7	0.8
5	Wall	Drywall	A	INTACT	Beige	004	Basement	Negative	0.7	< LOD
6	Stall	Wood	C	INTACT	Beige	004	Basement	Negative	0.7	< LOD
7	Toilet	Porcelain	C	INTACT	White	004	Basement	Negative	0.7	< LOD
8	Urinal	Porcelain	C	INTACT	White	004	Basement	Negative	0.7	< LOD
9	Sink	Porcelain	C	INTACT	White	004	Basement	Positive	0.7	32.9
10	Baseboard	Tile	A	INTACT	White	004	Basement	Negative	0.7	< LOD
11	Floor	Tile	A	INTACT	Beige	004	Basement	Negative	0.7	< LOD
12	Ceiling joist	Metal	A	INTACT	Black	004	Basement	Negative	0.7	< LOD
13	Drop ceiling	Drywall	A	INTACT	White	004	Basement	Negative	0.7	< LOD
14	Ceiling track	Metal	A	INTACT	White	004	Basement	Negative	0.7	< LOD
15	Door Casing	Metal	D	INTACT	Beige	004	Basement	Negative	0.7	< LOD
16	Door	Metal	D	INTACT	Beige	004	Basement	Negative	0.7	< LOD
17	Wall	Tile	C	INTACT	White	004	Basement	Negative	0.7	< LOD
18	Wall	Tile	A	INTACT	White	006	Basement	Negative	0.7	< LOD
19	Toilet	Porcelain	A	INTACT	White	006	Basement	Negative	0.7	< LOD
20	Beam	Metal	B	INTACT	Black	H002	Basement	Positive	0.7	8.6
21	Beam	Metal	B	INTACT	Black	H002	Basement	Positive	0.7	13.8
22	Ceiling joist	Metal	B	INTACT	Black	H002	Basement	Negative	0.7	< LOD
23	Beam flange	Metal	B	INTACT	Beige	H002	Basement	Positive	0.7	3.3
24	Ceiling	Drywall	B	INTACT	Beige	002	Basement	Negative	0.7	< LOD
25	Wall	Drywall	B	INTACT	Beige	002	Basement	Negative	0.7	< LOD
26	Beam	Metal	C	INTACT	Beige	002	Basement	Positive	0.7	1.9
27	HVAC Unit	Metal	C	INTACT	Beige	002	Basement	Negative	0.7	< LOD
28	Wall	Plaster	C	INTACT	Beige	ST02	Basement	Negative	0.7	0.11
29	Wall	Drywall	A	INTACT	Beige	ST02	Basement	Negative	0.7	< LOD
30	Hand Rail	Wood	A	PEELING	Brown	ST02	Basement	Negative	0.7	< LOD

**Table I. XRF Data**  
**USC 1600 Hampton Street Annex (#29a)**  
**Date Analyzed: 08/07,08/2013**

READING NO.	COMPONENT	SUBSTRATE	SIDE	CONDITION	COLOR	ROOM	FLOOR	RESULTS	ACTION LEVEL (mg/cm <sup>2</sup> )	PbC (mg/cm <sup>2</sup> )
31	Newel Post	Metal	C	INTACT	Beige	ST02	Basement	Positive	0.7	1.8
32	Baluster	Metal	C	INTACT	Beige	ST02	Basement	Positive	0.7	1.5
33	Baluster	Metal	C	INTACT	Beige	ST02	Basement	Positive	0.7	2
34	Stair Riser	Metal	C	INTACT	Beige	ST02	Basement	Negative	0.7	< LOD
35	Stair Riser	Metal	C	INTACT	Beige	ST02	Basement	Negative	0.7	< LOD
36	Stair Riser	Metal	C	INTACT	Beige	ST02	Basement	Positive	0.7	2.1
37	Stair Stringer	Metal	C	INTACT	Beige	ST02	Basement	Positive	0.7	3.2
38	Hand Rail	Wood	A	INTACT	Brown	ST02	Basement	Negative	0.7	< LOD
39	Stair Tread	Metal	A	PEELING	Beige	ST02	Basement	Negative	0.7	< LOD
40	Stair Tread	Metal	A	PEELING	Beige	ST02	Basement	Positive	0.7	1.7
41	Stair Tread	Metal	A	PEELING	Beige	ST02	Basement	Positive	0.7	1.3
42	Wall	Cinder Block	C	INTACT	White	003	Basement	Negative	0.7	< LOD
43	Wall	Drywall	C	INTACT	White	H001	Basement	Negative	0.7	< LOD
44	Beam	Metal	A	INTACT	Black	H001	Basement	Positive	0.7	9
45	Wall	Plaster	D	INTACT	White	009	Basement	Negative	0.7	< LOD
46	Door	Wood	D	INTACT	Beige	009	Basement	Negative	0.7	< LOD
47	Door Casing	Metal	D	INTACT	Beige	009	Basement	Negative	0.7	< LOD
48	Column	Drywall	Center	INTACT	White	007	Basement	Negative	0.7	< LOD
49	Partion wall	Drywall	Center	INTACT	White	007	Basement	Negative	0.7	< LOD
50	Partion wall cap	Wood	Center	INTACT	Stain	007	Basement	Negative	0.7	< LOD
51	Door	Wood	A	INTACT	Grey	011	Basement	Negative	0.7	< LOD
52	Door Casing	Metal	A	INTACT	Grey	011	Basement	Negative	0.7	< LOD
53	Column	Concrete	C	INTACT	White	011	Basement	Negative	0.7	< LOD
54	Wall	Drywall	C	INTACT	White	011	Basement	Negative	0.7	< LOD
55	Ceiling track	Metal	C	INTACT	White	011	Basement	Negative	0.7	< LOD
56	Ceiling track	Metal	C	INTACT	White	011	Basement	Negative	0.7	< LOD
57	Door	Metal	B	INTACT	Grey	EV02	Basement	Negative	0.7	< LOD
58	Door Casing	Metal	B	INTACT	Grey	EV02	Basement	Negative	0.7	< LOD
59	Hand Rail	Metal	B	INTACT	Brown	ST03	Basement	Negative	0.7	< LOD
60	Wall	Plaster	B	INTACT	White	ST03	Basement	Negative	0.7	< LOD

**Table I. XRF Data**  
**USC 1600 Hampton Street Annex (#29a)**  
**Date Analyzed: 08/07,08/2013**

READING NO.	COMPONENT	SUBSTRATE	SIDE	CONDITION	COLOR	ROOM	FLOOR	RESULTS	ACTION LEVEL (mg/cm <sup>2</sup> )	PbC (mg/cm <sup>2</sup> )
61	Door	Metal	C	INTACT	Beige	ST03	Basement	Negative	0.7	< LOD
62	Door Casing	Metal	C	INTACT	Beige	ST03	Basement	Negative	0.7	< LOD
63	Outer Door	Metal	B	INTACT	Brown	EV01	Basement	Positive	0.7	1.4
64	Door Casing	Metal	B	INTACT	Brown	EV01	Basement	Negative	0.7	0.3
65	Outer Door	Metal	B	INTACT	Brown	EV01	Basement	Positive	0.7	1.7
66	Door	Metal	C	INTACT	Brown	001	Basement	Negative	0.7	< LOD
67	Door Casing	Metal	C	INTACT	Brown	001	Basement	Negative	0.7	< LOD
68	Doorway	Metal	C	INTACT	Grey	001	Basement	Negative	0.7	< LOD
69	Stair Stringer	Metal	B	INTACT	Beige	ST01	Basement	Negative	0.7	< LOD
70	Stair Riser	Metal	B	INTACT	Beige	ST01	Basement	Negative	0.7	< LOD
71	Wall	Drywall	B	INTACT	White	ST01	Basement	Negative	0.7	< LOD
72	Wall	Cinder Block	C	INTACT	White	ST01	Basement	Negative	0.7	< LOD
73	Hand Rail	Metal	B	INTACT	Brown	ST01	Basement	Negative	0.7	< LOD
74	Wall	Drywall	C	INTACT	White	014	Basement	Negative	0.7	< LOD
75	Column	Drywall	Center	INTACT	White	014	Basement	Negative	0.7	< LOD
76	Cubicle	Metal	Center	INTACT	Beige	014	Basement	Negative	0.7	< LOD
77	Baseboard	Wood	D	INTACT	Beige	ST01	First	Negative	0.7	< LOD
78	Wall	Drywall	D	INTACT	Beige	ST01	First	Negative	0.7	< LOD
79	Door Casing	Wood	A	INTACT	Beige	ST01	First	Negative	0.7	0.4
80	Door Casing	Wood	A	INTACT	Beige	ST01	First	Negative	0.7	< LOD
81	Door	Metal	C	INTACT	Beige	ST01	First	Negative	0.7	< LOD
82	Door Casing	Metal	C	INTACT	Beige	ST01	First	Negative	0.7	< LOD
83	Stair Riser	Metal	C	INTACT	Brown	ST01	First	Positive	0.7	1.4
84	Stair Stringer	Metal	B	INTACT	Beige	ST01	First	Positive	0.7	3.6
85	Newel Post	Metal	D	INTACT	Beige	ST01	First	Positive	0.7	2.8
86	Baluster	Metal	D	INTACT	Beige	ST01	First	Positive	0.7	6.4
87	Hand Rail	Wood	D	INTACT	Stain	ST01	First	Negative	0.7	< LOD
88	Wall	Drywall	C	INTACT	Beige	108A	First	Negative	0.7	< LOD
89	Cabinet	Wood	D	INTACT	Beige	108A	First	Negative	0.7	< LOD
90	Cabinet	Wood	A	INTACT	Beige	108A	First	Negative	0.7	< LOD

**Table I. XRF Data**  
**USC 1600 Hampton Street Annex (#29a)**  
**Date Analyzed: 08/07,08/2013**

READING NO.	COMPONENT	SUBSTRATE	SIDE	CONDITION	COLOR	ROOM	FLOOR	RESULTS	ACTION LEVEL (mg/cm <sup>2</sup> )	PbC (mg/cm <sup>2</sup> )
91	Wall	Drywall	A	INTACT	Blue	108B	First	Negative	0.7	< LOD
92	Door	Wood	A	INTACT	Grey	108B	First	Negative	0.7	< LOD
93	Door Casing	Wood	A	INTACT	Grey	108B	First	Negative	0.7	< LOD
94	Baseboard	Wood	D	INTACT	Beige	109	First	Negative	0.7	< LOD
95	Ceiling	Drywall	D	INTACT	Beige	109	First	Negative	0.7	< LOD
96	Column	Metal	Center	INTACT	Black	108	First	Positive	0.7	3.8
97	Beam	Metal	Center	INTACT	Black	108	First	Positive	0.7	4.6
98	Ceiling joist	Metal	Center	INTACT	Black	108	First	Negative	0.7	< LOD
99	Column	Drywall	Center	INTACT	Blue	108	First	Negative	0.7	< LOD
100	Wall	Plaster	D	INTACT	Blue	108	First	Negative	0.7	< LOD
101	Wall	Drywall	C	INTACT	White	H101	First	Negative	0.7	< LOD
102	Wall	Drywall	C	INTACT	White	105A	First	Negative	0.7	< LOD
103	Door	Metal	A	INTACT	Grey	105A	First	Negative	0.7	< LOD
104	Door Casing	Metal	A	INTACT	Grey	105A	First	Negative	0.7	< LOD
105	Doorway	Metal	C	INTACT	Grey	105A	First	Negative	0.7	< LOD
106	Wall	Plaster	B	INTACT	White	V101	First	Negative	0.7	< LOD
107	Door	Metal	B	INTACT	Grey	V101	First	Negative	0.7	< LOD
108	Door Casing	Metal	B	INTACT	Grey	V101	First	Negative	0.7	< LOD
109	Win. Casing	Metal	A	INTACT	Brown	V101	First	Negative	0.7	< LOD
110	Wall	Drywall	C	INTACT	Beige	H102	First	Negative	0.7	< LOD
111	Old wall	Plaster	C	INTACT	Beige	H102	First	Negative	0.7	< LOD
112	Wall	Concrete	C	INTACT	Beige	H102	First	Negative	0.7	< LOD
113	Door	Metal	C	INTACT	Beige	102	First	Negative	0.7	< LOD
114	Door Casing	Metal	C	INTACT	Beige	102	First	Negative	0.7	< LOD
115	Wall	Tile	A	INTACT	White	102	First	Negative	0.7	< LOD
116	Floor	Tile	A	INTACT	White	102	First	Negative	0.7	< LOD
117	Stall	Metal	Center	INTACT	Brown	102	First	Negative	0.7	< LOD
118	Toilet	Porcelain	C	INTACT	White	102	First	Negative	0.7	< LOD
119	Toilet	Porcelain	C	INTACT	White	102	First	Negative	0.7	< LOD
120	Sink	Porcelain	C-1	INTACT	White	102	First	Positive	0.7	39.4

**Table I. XRF Data**  
**USC 1600 Hampton Street Annex (#29a)**  
**Date Analyzed: 08/07,08/2013**

READING NO.	COMPONENT	SUBSTRATE	SIDE	CONDITION	COLOR	ROOM	FLOOR	RESULTS	ACTION LEVEL (mg/cm <sup>2</sup> )	PbC (mg/cm <sup>2</sup> )
121	Sink	Porcelain	C-r	INTACT	White	102	First	Positive	0.7	39.3
122	Urinal	Porcelain	C	INTACT	White	102	First	Negative	0.7	< LOD
123	Wall	Drywall	C	INTACT	Beige	101	First	Negative	0.7	< LOD
124	Door	Metal	B	INTACT	Beige	101	First	Negative	0.7	< LOD
125	Door Casing	Metal	B	INTACT	Beige	101	First	Negative	0.7	< LOD
126	Wall	Drywall	B	INTACT	Beige	H103	First	Negative	0.7	< LOD
127	Door	Metal	C	INTACT	Beige	H103	First	Negative	0.7	< LOD
128	Door	Metal	C	INTACT	Grey	H103	First	Negative	0.7	< LOD
129	Door Casing	Metal	C	INTACT	Grey	H103	First	Negative	0.7	< LOD
130	Door Casing	Metal	C	INTACT	Beige	H103	First	Negative	0.7	< LOD
131	Wall	Drywall	B	INTACT	White	105	First	Negative	0.7	< LOD
132	Column	Drywall	Center	INTACT	White	105	First	Negative	0.7	< LOD
133	Wall	Plaster	D	INTACT	White	104	First	Negative	0.7	< LOD
134	Column	Drywall	B	INTACT	White	104	First	Negative	0.7	< LOD
135	Ceiling track	Metal	D	INTACT	White	104	First	Negative	0.7	< LOD
136	Door Casing	Metal	D	INTACT	Brown	104	First	Negative	0.7	< LOD
137	Door	Metal	D	INTACT	Brown	104	First	Negative	0.7	< LOD
138	Stair Riser	Metal	Center	INTACT	Brown	ST02	First	Positive	0.7	2.5
139	Stair Stringer	Metal	Center	INTACT	Beige	ST02	First	Positive	0.7	2
140	Baluster	Metal	Center	INTACT	Beige	ST02	First	Positive	0.7	2.4
141	Floor	Concrete	Center	INTACT	Grey	ST03	Basement	Negative	0.7	< LOD
142	Beam	Metal	Center	INTACT	Red	H003	Basement	Negative	0.7	< LOD
143		Shutter Calibrate								NA
144			Calibrate					Positive	0.7	0.8
145			Calibrate					Positive	0.7	0.7
146			Calibrate					Positive	0.7	0.7
147		Shutter Calibrate								3.22
148			Calibrate					Positive	0.7	0.7
149			Calibrate					Positive	0.7	0.7
150			Calibrate					Positive	0.7	0.7



**Table I. XRF Data**  
**USC 1600 Hampton Street Annex (#29a)**  
**Date Analyzed: 08/07,08/2013**

READING NO.	COMPONENT	SUBSTRATE	SIDE	CONDITION	COLOR	ROOM	FLOOR	RESULTS	ACTION LEVEL (mg/cm <sup>2</sup> )	PbC (mg/cm <sup>2</sup> )
151	Wall	Drywall	B	INTACT	White	H202	Second	Negative	0.7	< LOD
152	Door	Wood	D	INTACT	Grey	H202	Second	Negative	0.7	< LOD
153	Door Casing	Metal	D	INTACT	Grey	H202	Second	Negative	0.7	< LOD
154	Door Casing	Metal	D	INTACT	Beige	H202	Second	Negative	0.7	< LOD
155	Baseboard	Wood	A	INTACT	Beige	ST02	Second	Positive	0.7	1.9
156	Baseboard	Wood	A	INTACT	Beige	ST02	Second	Positive	0.7	1.2
157	Baseboard	Wood	D	INTACT	Beige	ST02	Second	Positive	0.7	3.5
158	Wall	Drywall	B	INTACT	Beige	ST02	Second	Negative	0.7	< LOD
159	Wall	Drywall	A	INTACT	Beige	ST02	Second	Negative	0.7	< LOD
160	Wall	Drywall	B	INTACT	Red	205	Second	Negative	0.7	< LOD
161	Wall	Drywall	D	INTACT	Beige	205	Second	Negative	0.7	< LOD
162	Column	Drywall	Center	INTACT	Beige	205	Second	Negative	0.7	< LOD
163	Column	Drywall	Center	INTACT	Beige	205	Second	Negative	0.7	< LOD
164	Cubicle	Metal	Center	INTACT	Beige	205	Second	Negative	0.7	< LOD
165	Door	Metal	D	INTACT	Beige	205	Second	Negative	0.7	< LOD
166	Door Casing	Metal	D	INTACT	Beige	205	Second	Negative	0.7	< LOD
167	Column	Drywall	Center	INTACT	Beige	208	Second	Negative	0.7	< LOD
168	Wall	Drywall	C	INTACT	Beige	213	Second	Negative	0.7	< LOD
169	Win. Casing	Metal	C	INTACT	Brown	213	Second	Negative	0.7	< LOD
170	Door	Metal	A	INTACT	Beige	213	Second	Negative	0.7	< LOD
171	Door Casing	Metal	A	INTACT	Beige	213	Second	Negative	0.7	< LOD
172	Wall	Drywall	D	INTACT	Beige	208	Second	Negative	0.7	< LOD
173	Wall	Drywall	D	INTACT	Beige	ST01	Second	Negative	0.7	< LOD
174	Door	Metal	B	INTACT	Beige	ST01	Second	Negative	0.7	< LOD
175	Door Casing	Metal	B	INTACT	Beige	ST01	Second	Negative	0.7	< LOD
176	Wall	Drywall	A	INTACT	White	H201	Second	Negative	0.7	< LOD
177	Doorway	Metal	A	INTACT	Grey	H201	Second	Negative	0.7	< LOD
178	Win. Casing	Metal	D	INTACT	Brown	V201	Second	Negative	0.7	< LOD
179	Win. Sill	Concrete	D	INTACT	Brown	V201	Second	Negative	0.7	< LOD
180	Outer Door	Metal	D	INTACT	Brown	EV01	Second	Positive	0.7	1.4

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**USC 1600 Hampton Street Annex (#29a)**  
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READING NO.	COMPONENT	SUBSTRATE	SIDE	CONDITION	COLOR	ROOM	FLOOR	RESULTS	ACTION LEVEL (mg/cm <sup>2</sup> )	PbC (mg/cm <sup>2</sup> )
181	Door Casing	Metal	D	INTACT	Brown	EV01	Second	Negative	0.7	0.3
182	Wall	Drywall	A	INTACT	White	EV01	Second	Negative	0.7	< LOD
183	Baluster	Metal	Center	INTACT	Beige	ST02	Third	Positive	0.7	5.2
184	Baseboard	Wood	A	INTACT	Beige	ST02	Third	Positive	0.7	2.8
185	Stair Stringer	Metal	A	INTACT	Beige	ST02	Third	Positive	0.7	1.7
186	Stair Riser	Metal	A	INTACT	Brown	ST02	Third	Positive	0.7	1.4
187	Sink	Porcelain	A	INTACT	White	303	Third	Positive	0.7	32.7
188	Wall	Tile	C	INTACT	Beige	303	Third	Positive	0.7	1.3
189	Wall	Tile	A	INTACT	Beige	303	Third	Positive	0.7	1.5
190	Floor	Tile	A	INTACT	Beige	303	Third	Negative	0.7	< LOD
191	Stall	Metal	C	INTACT	Beige	303	Third	Negative	0.7	< LOD
192	Baseboard	Tile	C	INTACT	Beige	303	Third	Negative	0.7	< LOD
193	Door	Metal	D	INTACT	Beige	303	Third	Negative	0.7	< LOD
194	Door Casing	Metal	D	INTACT	Beige	303	Third	Negative	0.7	< LOD
195	Wall	Tile	D	INTACT	Beige	304	Third	Positive	0.7	1.1
196	Floor	Tile	D	INTACT	Beige	304	Third	Negative	0.7	< LOD
197	Baseboard	Tile	C	INTACT	Beige	304	Third	Negative	0.7	< LOD
198	Urinal	Porcelain	A	INTACT	White	304	Third	Negative	0.7	< LOD
199	Stall	Metal	A	INTACT	Brown	304	Third	Negative	0.7	< LOD
200	Win. Casing	Metal	C	INTACT	Brown	308	Third	Negative	0.7	< LOD
201	Win. Casing	Metal	C	INTACT	Brown	308	Third	Negative	0.7	< LOD
202	Win. Casing	Metal	B	INTACT	Beige	308	Third	Negative	0.7	< LOD
203	Wall	Drywall	B	INTACT	White	308	Third	Negative	0.7	< LOD
204	Ceiling track	Metal	B	INTACT	White	308	Third	Negative	0.7	< LOD
205	Ceiling track	Metal	B	INTACT	White	301	Third	Negative	0.7	< LOD
206	Door	Metal	C	INTACT	Beige	301	Third	Negative	0.7	< LOD
207	Door Casing	Metal	C	INTACT	Beige	301	Third	Negative	0.7	< LOD
208	Door Casing	Metal	C	INTACT	Grey	301	Third	Negative	0.7	< LOD
209	Wall	Drywall	D	INTACT	White	301	Third	Negative	0.7	< LOD
210	Wall	Drywall	A	INTACT	Beige	301	Third	Negative	0.7	< LOD

**Table I. XRF Data**  
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READING NO.	COMPONENT	SUBSTRATE	SIDE	CONDITION	COLOR	ROOM	FLOOR	RESULTS	ACTION LEVEL (mg/cm <sup>2</sup> )	PbC (mg/cm <sup>2</sup> )
211	HVAC Unit	Metal	C	INTACT	Beige	301	Third	Negative	0.7	< LOD
212	Doorway	Metal	A	INTACT	Beige	H301	Third	Negative	0.7	< LOD
213	Outer Door	Metal	D	INTACT	Beige	EV01	Third	Positive	0.7	1.6
214	Door Casing	Metal	D	INTACT	Beige	EV01	Third	Negative	0.7	< LOD
215	Wall	Drywall	A	INTACT	Beige	H301	Third	Negative	0.7	< LOD
216	Wall	Drywall	C	INTACT	Beige	H301	Third	Negative	0.7	< LOD
217	Door	Metal	B	INTACT	Beige	ST01	Third	Negative	0.7	< LOD
218	Door Casing	Metal	B	INTACT	Beige	ST01	Third	Negative	0.7	< LOD
219	Wall	Drywall	D	INTACT	Yellow	314	Third	Negative	0.7	< LOD
220	Door Casing	Metal	B	INTACT	White	314	Third	Negative	0.7	< LOD
221	Door	Metal	B	INTACT	White	314	Third	Negative	0.7	< LOD
222	Column	Drywall	Center	INTACT	Yellow	310	Third	Negative	0.7	< LOD
223	Column	Drywall	Center	INTACT	Yellow	310	Third	Negative	0.7	< LOD
224	Wall	Drywall	C	INTACT	Yellow	311	Third	Negative	0.7	< LOD
225	Wall	Drywall	C	INTACT	White	313	Third	Negative	0.7	< LOD
226	Wall	Drywall	D	INTACT	Grey	313	Third	Negative	0.7	< LOD
227	Door	Wood	B	INTACT	White	313	Third	Negative	0.7	< LOD
228	Door Casing	Wood	B	INTACT	White	313	Third	Negative	0.7	< LOD
229	Wall	Tile	C	INTACT	White	204	Second	Negative	0.7	< LOD
230	Floor	Tile	C	INTACT	White	204	Second	Negative	0.7	< LOD
231	Wall	Metal	A	INTACT	Yellow	EV02		Positive	0.7	3.8
232	Wall	Metal	C	INTACT	Beige	EV02		Negative	0.7	< LOD
233	Door-gate	Metal	B	INTACT	Black	EV02		Negative	0.7	< LOD
234	Door-gate	Metal	B	INTACT	Black	EV02		Negative	0.7	< LOD
235	Door	Metal	B	INTACT	Grey	EV02		Negative	0.7	< LOD
236	Door Casing	Metal	B	INTACT	Grey	EV02		Negative	0.7	< LOD
237	Door Casing	Metal	D	INTACT	Beige	EV02		Negative	0.7	< LOD
238	Door	Metal	D	INTACT	Beige	EV02		Negative	0.7	< LOD
239	Wall	Cinder Block	D	INTACT	White	EV02		Negative	0.7	< LOD
240		Shutter Calibrate								NA

**Table I. XRF Data**  
**USC 1600 Hampton Street Annex (#29a)**  
**Date Analyzed: 08/07,08/2013**

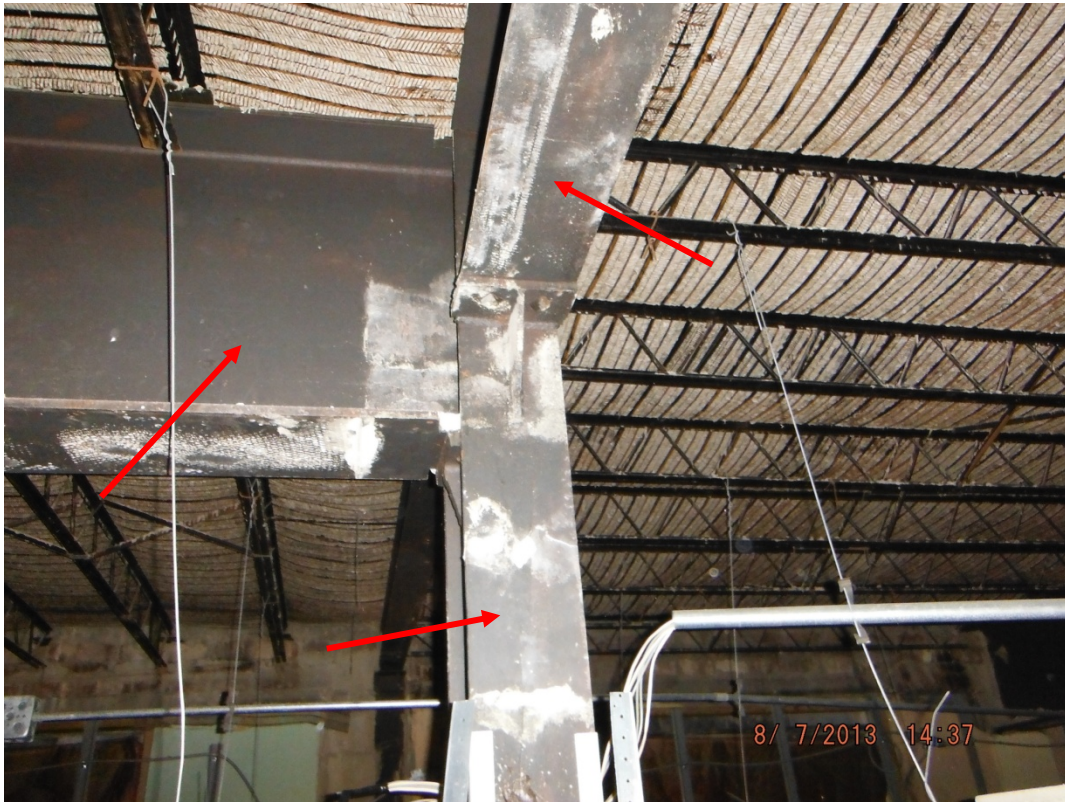
READING NO.	COMPONENT	SUBSTRATE	SIDE	CONDITION	COLOR	ROOM	FLOOR	RESULTS	ACTION LEVEL (mg/cm <sup>2</sup> )	PbC (mg/cm <sup>2</sup> )
241			Calibrate					Positive	0.7	0.7
242			Calibrate					Positive	0.7	0.7
243			Calibrate					Positive	0.7	0.8



Porcelain sinks in bathrooms





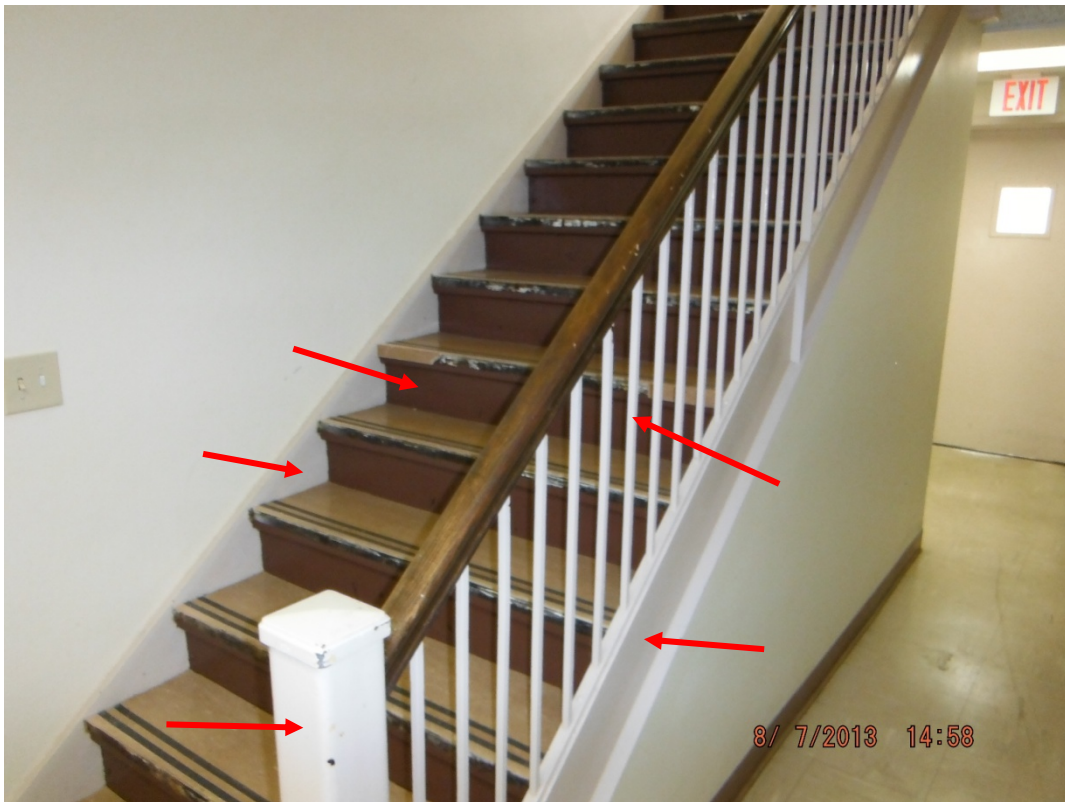


Structural beams and columns in original building





Stair newel post, balusters, risers, and stringers







Paint on edge of stair step



Wooden baseboard in stairway ST02





Outer elevator door (EV01)



Yellow paint on walls and ceiling of the service elevator (EV02)



Wall tile in bathrooms on the 3<sup>rd</sup> floor



## **APPENDIX B**

### Personnel Certification



# United States Environmental Protection Agency

This is to certify that

Jeffrey Steve 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 a:

Inspector

In the Jurisdiction of:

South Carolina

This certification is valid from the date of issuance and expires

July 29, 2015


SC-I-18721-2

Certification #

JUN - 6 2012

Issued On



  
Jeaneanne M. Gettle, Chief

Pesticides and Toxic Substances Branch

## **APPENDIX C**

SCDHEC Lead-Based Paint Disposal Fact Sheets

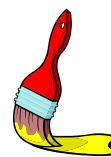


# Lead-based Paint Disposal Fact Sheet

## Terms You Should Know:

- ≡ **LEAD-BASED PAINT** - paint containing  $>0.06\%$  ( $>600$  ppm) **total lead**; or  $\geq 0.7$  mg/cm<sup>2</sup> **XRF**.
- ≡ **MUNICIPAL SOLID WASTE LANDFILL (MSWLF)** - A lined landfill with a leachate collection system & ground water monitoring that accepts municipal solid waste (garbage.) These landfills can accept waste painted with lead-based paint.
- ≡ **CONSTRUCTION, DEMOLITION, & LAND-CLEARING DEBRIS LANDFILL, a.k.a., "C&D Landfill"** - A landfill that accepts certain construction & demolition debris and land-clearing debris & yard trash. These landfills can NOT accept waste painted with lead-based paint.
- ≡ **"Total lead" analysis** - reveals the total amount of lead contained in the media being tested and is expressed in "ppm for Total lead"; used to determine acceptability of lead-based painted C&D waste for disposal at C&D landfills; when the total lead level on painted waste exceeds 0.06% by weight ( $>600$  ppm) - the waste is NOT acceptable for disposal at a C&D landfill.
- ≡ **"TCLP" analysis** - (Toxicity characteristic leaching procedure) is used to determine whether or not a waste is a characteristic hazardous waste due to leachability and is expressed in mg/l;  $\geq 5.0$  mg/l is considered hazardous under the SC Hazardous Waste Management Regulation.
- ≡ **"XRF" analysis** - (X-ray Fluorescence Spectrum Analyzer) is used in-situ to determine the presence of lead-based paint; a reading of  $\geq 0.7$  mg/cm<sup>2</sup> means lead-based paint is present and, therefore, the painted waste is NOT acceptable at a C&D landfill. (The XRF analyzer must be licensed with DHEC.)

## Facts You Should Know:



- ≡ C&D Landfills **CAN NOT** accept wastes painted with lead-based paint.
- ≡ All wastes painted with lead-based paint may be disposed in a Municipal Solid Waste Landfill.
- ≡ When determining proper disposal (C&D vs. MSWLF) for painted waste, one of the following methods must be used to test for the presence of lead-based paint. Analyze paint:
  - γ For total lead, *not* TCLP (All chemical analyses must be done by a laboratory certified by either DHEC or EPA's NLLAP (National Lead Laboratory Accreditation Program.); **OR**,
  - γ Using a X-ray Fluorescence (XRF) Spectrum Analyzer (S.C. licensed.)

≡ When paint is chemically removed, scraped, or sandblasted from a structure, the paint residue - after removal from the substrate - must ALWAYS be tested for lead using **TCLP** to determine if it is a “hazardous waste.” This requirement does NOT apply to paint residue removed from a home or residence. (Paint residue generated from a home or residence is considered household hazardous waste.)

≡ Generators that meet the requirements of a “conditionally exempt small quantity generator” pursuant to R.61-79.261.5, may dispose of hazardous waste in a Subtitle D landfill with approval from the landfill in lieu of disposal in a Subtitle C landfill.

≡ With regard to disposal, all non-hazardous wastes painted with “lead-based paint” are still considered “solid waste” NOT “hazardous wastes.”

TYPES OF LANDFILLS	DESCRIPTION OF LANDFILL	ACCEPTABLE WASTE	DETERMINATION OF LEAD LEVEL
C&D	Construction, Demolition, & Land-Clearing Debris Landfill; Least protected type landfill; no liners, & no groundwater monitoring	See Regulation 61-107.11, Appendix I (NO waste painted with lead-based paint)	Analyze paint using <i>Total Lead analysis, or XRF analyzer</i> . [Total Pb levels >600 ppm & XRF levels $\geq 0.7$ mg/cm <sup>2</sup> are NOT acceptable for disposal.]
MSWLF (Subtitle D)	Municipal Solid Waste Landfill; Synthetic liner & leachate collection system	- Can accept C&D waste painted with lead-based paint.  - May accept hazardous wastes from “conditionally exempt small quantity generators” if acceptable under their Special Waste Plan.	- No testing required by DHEC  - TCLP
Subtitle C §	Hazardous waste landfill	Paint residue with >5.0 mg/l lead	TCLP

§ Disposal in a Subtitle C landfill does NOT apply to waste generated by construction or demolition activities conducted on a household or residence.

## Recycling C&D Waste Paint with Lead-based Paint:



≡ Metals painted with lead-based paint **CAN** be recycled - without removing the paint.

≡ Unless otherwise approved by the Department, C&D debris painted with lead-based paint can **NOT** be used as:

- γ mulch,
- γ fill material, or
- γ roadbed

Ω EXCEPTION: Crushed brick and block can be used for road bed **IF** it will be encapsulated in asphalt or cement.

## **Best Management Practices Recommended by EPA:**

EPA encourages residents and contractors managing waste painted with lead-based paint from households to take common sense measures to minimize the generation of lead dust, limit access to stored wastes painted with lead-based paint and maintain the integrity of waste packaging material during transfer of the waste. The following actions are recommended:

- Collect paint chips and dust, and dirt and rubble in plastic trash bags for disposal;
- Store larger lead-base painted architectural debris pieces in containers until ready for disposal;
- Consider using a covered mobile dumpster (such as a roll-off container for storage of debris until the job is done;
- Follow the guide lines contained in this Fact Sheet for proper disposal of waste painted with lead-based paint.

### ***NOTE:***

Contractors working in residential dwellings are subject to either one or both of the following:

— The HUD Guidance for contractors doing publicly funded rehabilitation/renovation projects in public housing can be accessed via the Internet at <http://www.hud.gov/lea/learules.html>.

— TSCA 402/404 training and certification requirements. (See 40 CFR Part 745; 61 FR 45778, August 29, 1996) and the proposed TSCA onsite management standards (See 40 CFR Part 745, Subpart P; 63 FR 70227 -70230, Dec. 18, 1998.)

[The above-mentioned BMPs for households are similar to those included in the HUD Guidelines for individuals controlling lead-based paint (LBP) hazards in housing. HUD requires that contractors using HUD funding adhere to LBP hazard control guidelines. Non-adherence to these guidelines can potentially result in the loss of funding.]



**LIMITED ASBESTOS CONTAINING  
MATERIALS INVESTIGATION  
REPORT**

**USC 1600 HAMPTON STREET ANNEX  
#29a  
1600 HAMPTON STREET  
COLUMBIA, SOUTH CAROLINA**

**REPORT PREPARED FOR:**



**UNIVERSITY OF  
SOUTH CAROLINA**

**UNIVERSITY OF SOUTH CAROLINA  
743 Green Street  
Columbia, South Carolina 29208**

**BY:**

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(803) 254-4540**

**September 3, 2013  
Revised February 11, 2014**

**E5300.12**

## TABLE OF CONTENTS

I. Executive Summary.....	2
II. Introduction .....	3
III. Investigation Results.....	3
IV. Asbestos Containing Materials Description & Assessment .....	6
V. Recommendations .....	7

### APPENDIX A

- Site Vicinity Map (Figure 1)
- General Building Plans (Figures 2-5)
- Sample Location Plans (Figures 6-9)
- Homogeneous Area Plans (Figures 10-13)

### APPENDIX B

- Summary of Samples (Table I)
- Summary of Asbestos Containing Materials (Table II)
- Summary of Inspection
- Physical Assessment Data Sheets
- Bulk Asbestos Analytical Reports (F&ME)
- Chain of Custody (F&ME)
- Bulk Asbestos Analytical Reports (USC)
- Chain of Custody (USC)

### APPENDIX C

- Personnel Certifications

### APPENDIX D

- SCDHEC Regulation Summary
- SCDHEC Abatement Project Forms

## I. EXECUTIVE SUMMARY

As requested, F&ME Consultants has completed a Limited Asbestos Containing Materials (ACM) investigation of the University of South Carolina's 1600 Hampton Street Annex building (#29a) located at 1600 Hampton Street in Columbia, South Carolina. This investigation was conducted in accordance with SCDHEC, USEPA, and OSHA regulations.

It is our understanding that the existing building is scheduled for a complete interior renovation. Therefore, the scope of this limited ACM investigation was to identify, sample and assess materials suspected of containing asbestos that are located throughout the interior of the subject building. The field investigation was performed on August 7<sup>th</sup> and 8<sup>th</sup>, 2013. Additional samples were also provided by USC's HAZMAT personnel.

The limited investigation of the subject building identified numerous suspect materials. Of the materials analyzed, laboratory results indicate that the black mastic associated with 12" x 12" non-ACM floor tiles is an ACM. Furthermore, the additional samples provided by USC's HAZMAT personnel indicated that the carpet adhesive and overlying carpet on all four (4) floors are contaminated with residual black mastic. Attached is the report of our findings.

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



Michael S. Mincey  
Environmental Professional  
Asbestos Consultant/Mngmnt. Planner  
SCDHEC License No: MP-00161  
Expiration Date 02/15/2014



Glynn M. Ellen  
Senior Environmental Professional  
Asbestos Consultant Management Planner  
SCDHEC License No: ASB-22641  
Expiration Date 02/15/2014

MSM/GME/jls

## II. INTRODUCTION

As requested, F&ME Consultants has completed a Limited Asbestos Containing Materials (ACM) investigation of the University of South Carolina's 1600 Hampton Street Annex building (#29a) located at 1600 Hampton Street in Columbia, South Carolina. This investigation was conducted in accordance with SCDHEC, USEPA, and OSHA regulations.

It is our understanding that the current building is scheduled for a complete interior renovation. Therefore, the scope of this limited ACM investigation was to identify, sample and assess materials suspected of containing asbestos that are located throughout the interior of the subject building. The field investigation was performed on August 7<sup>th</sup> and 8<sup>th</sup>, 2013.

The results, conclusions and recommendations from this investigation are representative of the conditions observed at the site on the dates of the field inspection. F&ME does not assume responsibility for any changes in conditions or circumstances that occur after the inspection. Use of this document for bidding purposes is not recommended without prior consultation with F&ME.

## III. INVESTIGATION RESULTS

The purpose of this limited investigation was to locate, sample and record the physical characteristics of suspect ACM associated with the interior of the subject building in anticipation of renovation activities. Therefore, the quantities and physical condition of suspect materials were assessed and bulk samples of these materials were submitted for laboratory analysis.

The subject building is a four (4) story concrete and steel structure with steel columns, steel trusses and poured-in-place concrete flooring. Interior finishes include “furred out” drywall walls over original plaster walls, masonry block walls, suspended ceiling systems, floor tiles, ceramic tiles, carpeting, and exposed concrete flooring. Exterior finishes include textured concrete walls and a flat built-up roof.



*Photo 1. Textured concrete walls make up the majority of the exterior of the subject building.*

The building structure consists of a basement and first through third floors. Its original construction date is unknown. However, it appears that multiple renovations have occurred through the years as evidenced by the “furred out” drywall walls over the original plaster walls as well as the concealment of the original window frames on the first and second floors. Furthermore, additions were also observed, including an area in the southeast portion of the basement and room 104. In room 104, the west wall was noted to have the same texturing as observed on the exterior wall surfaces, indicating that this wall was previously exterior to the structure. See Appendix A for the General Building Plans (Figures 2-5) for the layout of the subject building.

Due to the age of the subject building, components such as electrical panels, fire doors, elevator brake shoes, etc., could contain asbestos. However, due to the inaccessibility of the materials, the destructive nature of bulk sampling, and/ or the potential for voiding warranties (i.e. drilling into fire doors), these suspect materials were not sampled during this investigation. It is important to understand that additional investigations of these systems will be required if they are to be

impacted by renovation activities. Furthermore, the existing fire doors observed during the field investigation were metal doors in metal door casings. While these doors appear to be non-suspect, there is still the potential for the core to contain asbestos.

Suspect materials identified during this investigation included the following materials:

- Drywall/ joint compounds
- Baseboard adhesive
- 2'x4' ceiling panels
- Carpet adhesive
- HVAC mastics
- Fire stop caulks
- Black sink undercoating
- Bathroom wall tile adhesive
- 12"x12" Beige w/ white/gray floor tiles and mastic
- Stair tread adhesive
- Plaster
- Fire resistant board
- Green board/ joint compound
- Various caulks
- Wall texturing

Remaining building materials (i.e. concrete, metal, wood, brick, carpet, etc.) were not considered suspect.

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. Proper sampling and chain-of-custody protocol were followed to ensure appropriate handling and delivery of samples to the analytical laboratory. See Appendix A for the Sample Location Plans (Figure 6-9).

A total of one hundred twelve (112) samples were collected from the subject building. Due to multiple layering of some materials and the implementation of a "first-positive stop" protocol, one hundred and eighty-four (184) samples were analyzed by PLM and fourteen (14) were TEM-confirmed. Of the materials analyzed, the black mastic associated with 12" x 12" non-ACM floor tiles was found to be an ACM (also see Table II, Summary of Asbestos Containing Materials). For more information regarding the locations of this material, refer to the Homogeneous Area Plans (Figures 10-13) located in the appendix.

During the investigation, three (3) samples of the exterior wall texturing were collected from the wall in room 104 due to the potential for this material to be impacted by the planned renovation activities. According to SCDHEC regulations, the analysis of three (3) samples is sufficient to determine whether or not the wall texturing is negative for asbestos relative to the sampled wall located in room 104 only. However, a total of seven (7) samples will be required in order to satisfy SCDHEC requirements for deeming all exterior wall texturing located on the majority of the subject building's exterior as a non-ACM. Therefore, additional samples of this material will be required if any of the planned renovations impact the exterior wall surfaces. In addition to the exterior wall texturing, another similar texturing material was found in the rear stairwell (ST03). This material was also sampled and analyzed during this investigation. Both of the wall texture materials were found to be non-ACM.

While performing this limited investigation, black mastic was observed under 12" x 12" floor tiles found in various areas of the building. The analysis of samples collected revealed them to be non-ACM floor tiles over ACM black mastic. These tiles and associated mastic were noted mostly in the basement area, but were also found in isolated areas on all other floors of the building. The majority of the building was found with a carpet and associated adhesive overlying concrete floors. Evidence of residual black/brown mastic was noted which predates the current carpet installed throughout the building. This residual mastic appeared more concentrated under the carpet of the second and third floors and more than likely is related to the black mastic found under the non-ACM tiles in other areas. During the limited investigation, eight (8) samples of carpet adhesive with this underlying black/brown mastic were collected throughout the building. Seven of eight (8) samples were analyzed by PLM which returned negative results. TEM analysis was performed on an eighth (8) sample taken from the third floor which indicated that the sample contained <0.25% chrysotile. SCDHEC considers only those materials with >1% asbestos to be ACM. In an attempt to further confirm the negative results, the laboratory was asked to run an additional confirmation TEM analysis on a carpet adhesive sample taken from an area that returned negative PLM results but was noted during the field investigation to have the residual mastic. This additional TEM analysis confirmed the carpet adhesive to be a non-ACM.



*Photo 2. Asbestos-containing black mastic under non-ACM 12"x12" floor tiles was found in various areas of the subject structure. An area of exposed black mastic was observed in the basement mechanical room (002) as depicted herein.*

While the carpet adhesive is considered a non-ACM according to the SCDHEC requirements, it is important to note that OSHA considers any material with any amount of asbestos fibers to be an ACM. In addition, the evidence was observed which indicates the possibility that more concentrated amounts of residual mastic may be discovered during the proposed renovation activities. This information was presented to USC HAZMAT, who decided to return to the building to collect additional samples in an attempt to delineate the locations of the positive residual mastic. The analysis of the samples collected indicated that concentrations of residual ACM black mastic are present. Therefore, carpet adhesive is deemed contaminated by the residual black mastic and is an ACM. For this reason, the carpet adhesive and overlying carpet throughout the building are to be handled as ACM during removal activities.

The Appendices include a Site Vicinity Map (Figure 1), General Building Plans (Figures 2-5), Sample Location Plans (Figures 6-9), Homogeneous Area Plans (Figures 10-13), a Summary of Samples (Table I), a Summary of Asbestos Containing Materials (Table II), Physical Assessment Data Sheets, Bulk Sample Analysis Reports, the Chain of Custody, Personnel Certifications, a SCDHEC Regulation Summary and SCDHEC Abatement Project Forms.

## IV. ASBESTOS CONTAINING MATERIALS DESCRIPTION & ASSESSMENT

The following is a description and quantity of the ACM identified within the interior of the subject building structure (See Homogeneous Area Plans, Figures 10-13):

- HA-1 – Black Floor Tile Mastic under non-ACM Beige 12”x12” Floor Tile (~5,500 S.F.)

Asbestos-containing black mastic was found under the non-ACM 12” x 12” floor tiles of the subject building. Additionally, the mastic was found to be exposed in the basement mechanical room where the overlying floor tiles had been removed. It is difficult to assess the overall condition of the mastic due to the overlaying floor tiles. Where observed, this material appears to be intact and is in a non-friable condition. Prior to the start of renovation activities to the subject structure, this material and the non-ACM floor tiles must be removed and disposed of as ACM by a licensed abatement contractor.

- HA-2 – Residual Black Mastic under Carpet (~20,500 S.F.)

Residual asbestos-containing black mastic was found under carpet in the subject building. This material was most likely leftover from the removal of floor tiles during previous renovation activities. While analytical results obtained during this limited investigation indicate that the residual black mastic is found at <1% in the carpet adhesive, there is potential that patches of the mastic may be encountered during the removal of the overlying carpet.

In an effort to further delineate the location of this residual mastic, USC’s HAZMAT personnel performed some additional sampling. According to their laboratory results, the residual black mastic was found to be contaminating the carpet adhesive on all four (4) floors of the subject structure. Where observed, this material appears to be intact and is in a non-friable condition. Prior to the start of renovation activities to the subject structure, this material, the non-ACM carpet adhesive and overlying carpet must be removed and disposed of as ACM by a licensed abatement contractor.

Asbestos containing materials are categorized by SCDHEC as friable (a.k.a. regulated asbestos containing materials, or RACM), Category I non-friable ACM (packing, gaskets, floor coverings, asphalt roofing products, etc.) and Category II non-friable ACM (other non-friable materials not covered in Category I). SCDHEC regulates any disturbances of friable/RACM, requiring its removal prior to renovation activities.

SCDHEC also legally tracks the dumping of all ACM into landfills. Therefore, SCDHEC must be notified prior to abatement and demolition projects in order to arrange for the proper disposal of ACM and associated contaminated debris. Most landfills will not accept ACM or asbestos-contaminated debris. This is an important consideration for the owner because it is more expensive to dispose of ACM than normal debris. If the abatement/ demolition contractor selects a landfill that accepts ACM, the entire load of abatement/ demolition debris could be transported to the permitted landfill. However, since the ACM would be mixed in with the total demolition debris, all of the debris would be considered to be ACM resulting in higher disposal costs. Therefore, it is recommended that removal of all asbestos is conducted prior to and separate from building demolition activities.



Unlike SCDHEC, OSHA does not distinguish between friable and non-friable ACM, regulated and non-regulated ACM, and/or ACM in good condition versus ACM in poor/damaged condition. Instead, OSHA regulates all worker contact with asbestos.

This report has been prepared exclusively for the University of South Carolina, and shall not be disseminated in whole or part to other parties without prior consent from the University of South Carolina or F&ME Consultants, Inc. No other environmental issues are addressed in this report.

## V. RECOMMENDATIONS

It is our understanding that this limited investigation was required in anticipation of planned interior renovations. For this reason, ACM and contaminated materials (i.e. non-ACM floor tiles, carpet adhesive with residual ACM mastic, etc.) identified during this investigation must be abated prior to the commencement of renovation activities. All asbestos waste, including contaminated building materials (i.e. non-ACM floor tiles, non-ACM carpet etc.), must be deposited in a landfill permitted by the SCDHEC for receiving ACM.

It is important to note that no suspect pipe insulation was observed during this investigation. However, due to the age of the building, selective demolition may be necessary in some areas in order to determine whether or not original piping with suspect insulation were abandoned in-place within the wall cavities.

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 (see below for a summary).

If any concealed and/or inaccessible ACM are encountered during asbestos abatement or demolition activities, the affected contractor(s) must stop work, take appropriate actions, and notify the Owner/ Abatement Contractor/ Asbestos Consultant for an appropriate response action. The SCDHEC must be notified in the event that any additional ACM is discovered, as well as changes in the condition of identified 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 demolition/removal work areas. This notification requirement is also extended to any persons/employees who work near the demolition/removal work areas.

*Project Design.* Furthermore, abatement projects that will remove more than 3,000 square, 1,500 linear 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.

## **APPENDIX A**

Site Vicinity Map (Figure 1)

General Building Plans (Figures 2-5)

Sample Location Plans (Figures 6-9)

Homogeneous Areas Plans (Figures 10-13)







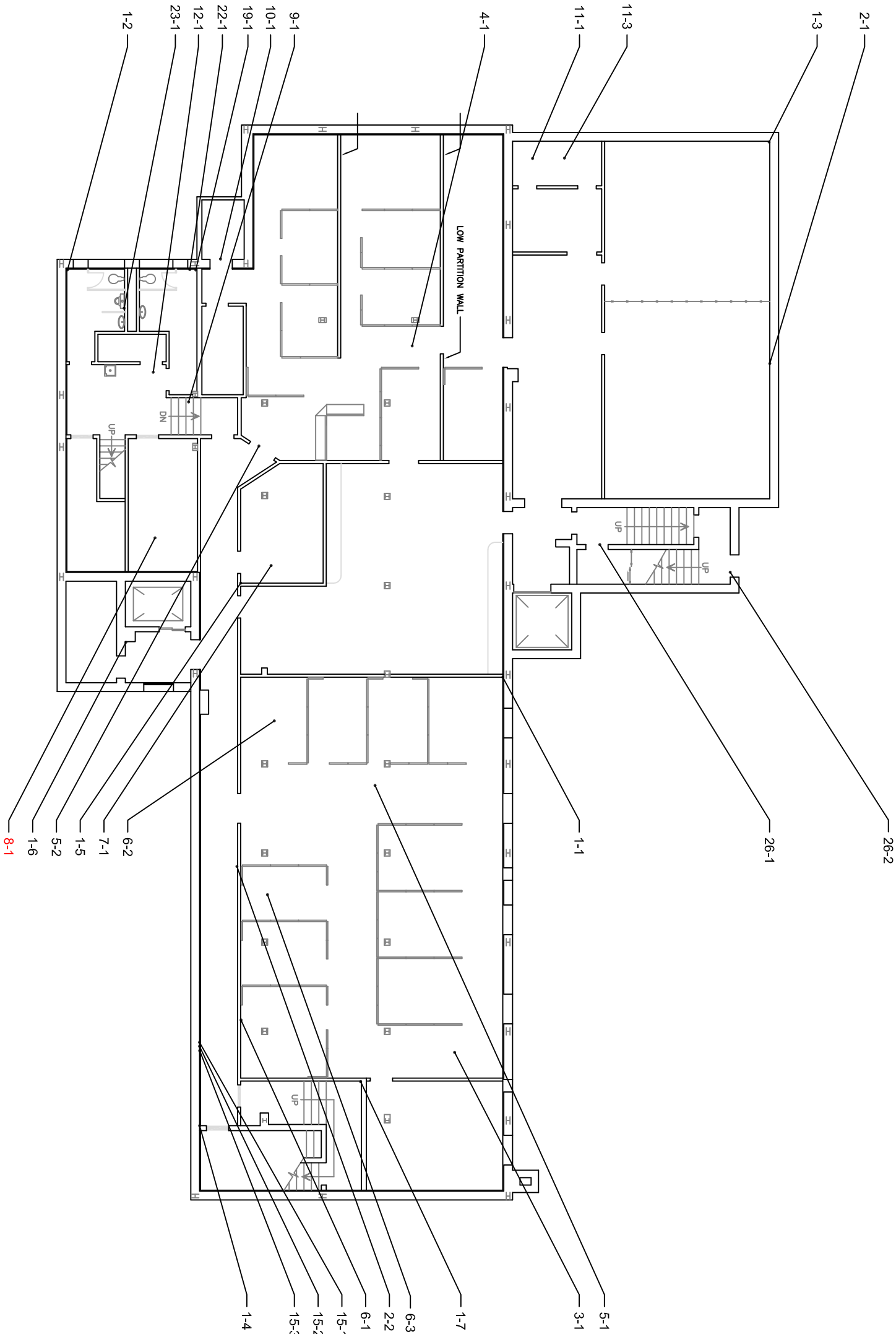
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**SCALE: 1/16" = 1.0'**



**SCALE: 1/16" = 1.0'**




**BASEMENT FLOOR PLAN – 029A**  
SCALE: 1/16" = 1.0'

DRWN. BY: N/A
CHKD. BY: JLS
APPR. BY: GME
NOTES:

ORIGINAL:
REVISIONS:
1
2
3
SCALE
1/16" = 1.0'

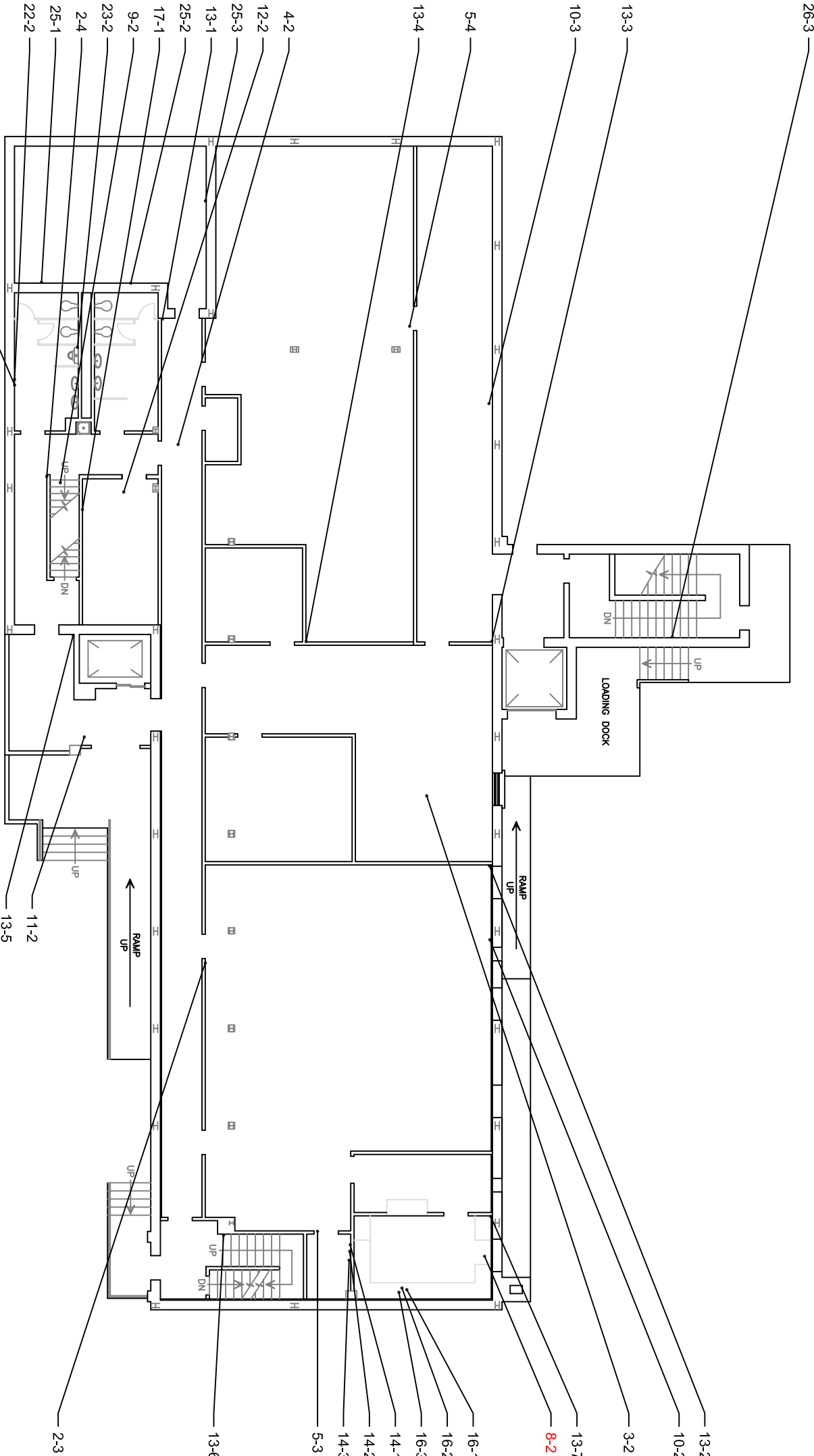
**F&ME**  
CONSULTANTS  
GEOTECHNICAL - ENVIRONMENTAL - MATERIALS  
COLUMBIA, SOUTH CAROLINA

**SAMPLE LOCATION PLAN**  
 **University of South Carolina**  
ASBESTOS CONTAINING MATERIALS INVESTIGATION  
1600 Hampton Street - Annex Building  
Columbia, South Carolina  
USC Project Number: H27-6052

F&ME CONSULTANTS  
PROJECT NUMBER:  
**E5300.12**

FIGURE NUMBER:  
**#6**





**FIRST FLOOR PLAN – 029A**  
SCALE: 1/16" = 1.0'


DRWN. BY: N/A
CHKD. BY: JLS
APPR. BY: GME
NOTES:

ORIGINAL:
REVISIONS:
1
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SCALE
1/16" = 1.0'

F&ME

CONSULTANTS

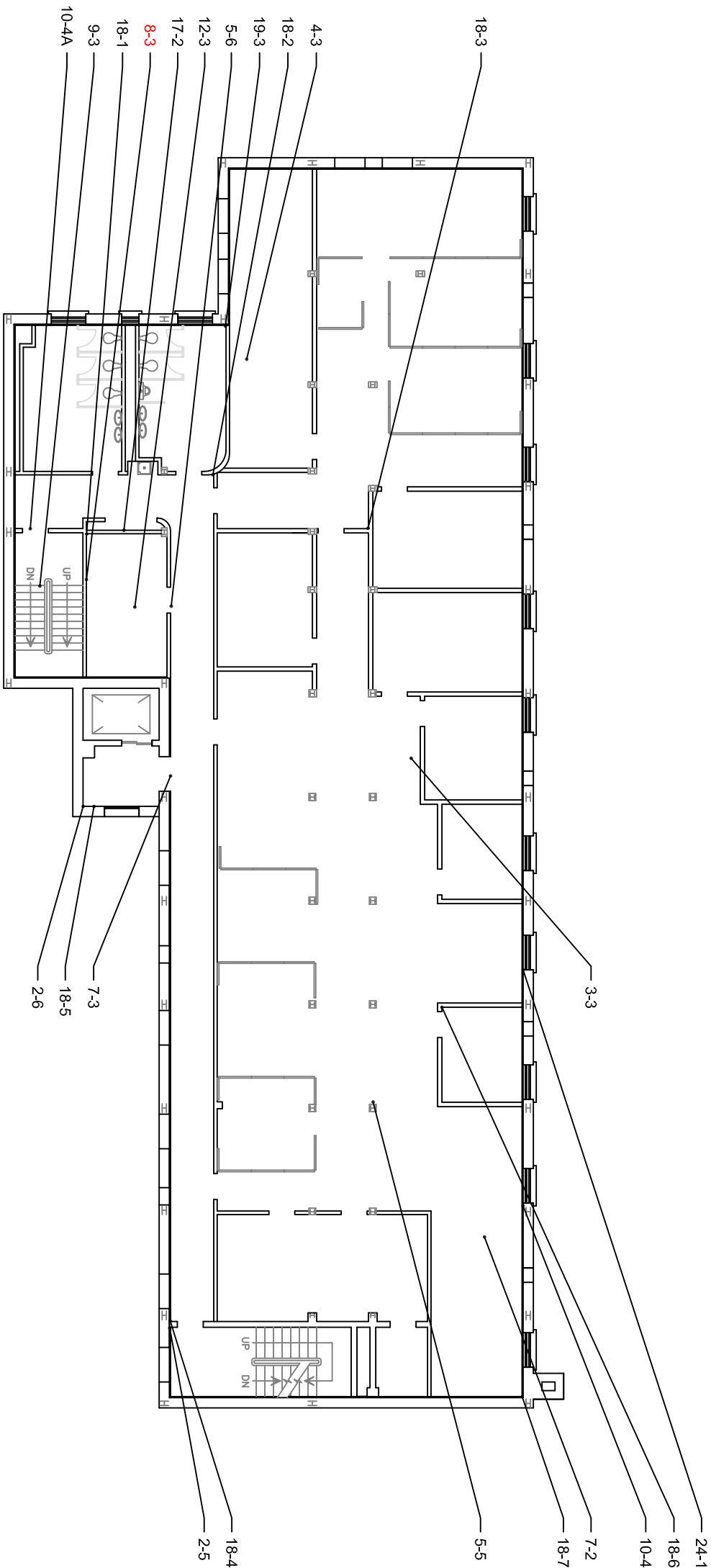
GEOTECHNICAL - ENVIRONMENTAL - MATERIALS  
COLUMBIA, SOUTH CAROLINA

University of South Carolina

ASBESTOS CONTAINING MATERIALS INVESTIGATION  
1600 Hampton Street - Annex Building  
Columbia, South Carolina  
USC Project Number: H27-6052

F&ME CONSULTANTS  
PROJECT NUMBER:

E5300.12



SECOND FLOOR PLAN – 029A

SCALE: 1/16" = 1.0'

SAMPLE LOCATION PLAN



University of South Carolina

ASBESTOS CONTAINING MATERIALS INVESTIGATION  
1600 Hampton Street - Annex Building  
Columbia, South Carolina  
USC Project Number: H27-6052

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GEOTECHNICAL - ENVIRONMENTAL - MATERIALS  
COLUMBIA, SOUTH CAROLINA

ORIGINAL:

REVISIONS:

1

2

3

SCALE  
1/16" = 1.0'

DRWN. BY: N/A

CHKD. BY: JLS

APPR. BY: GME

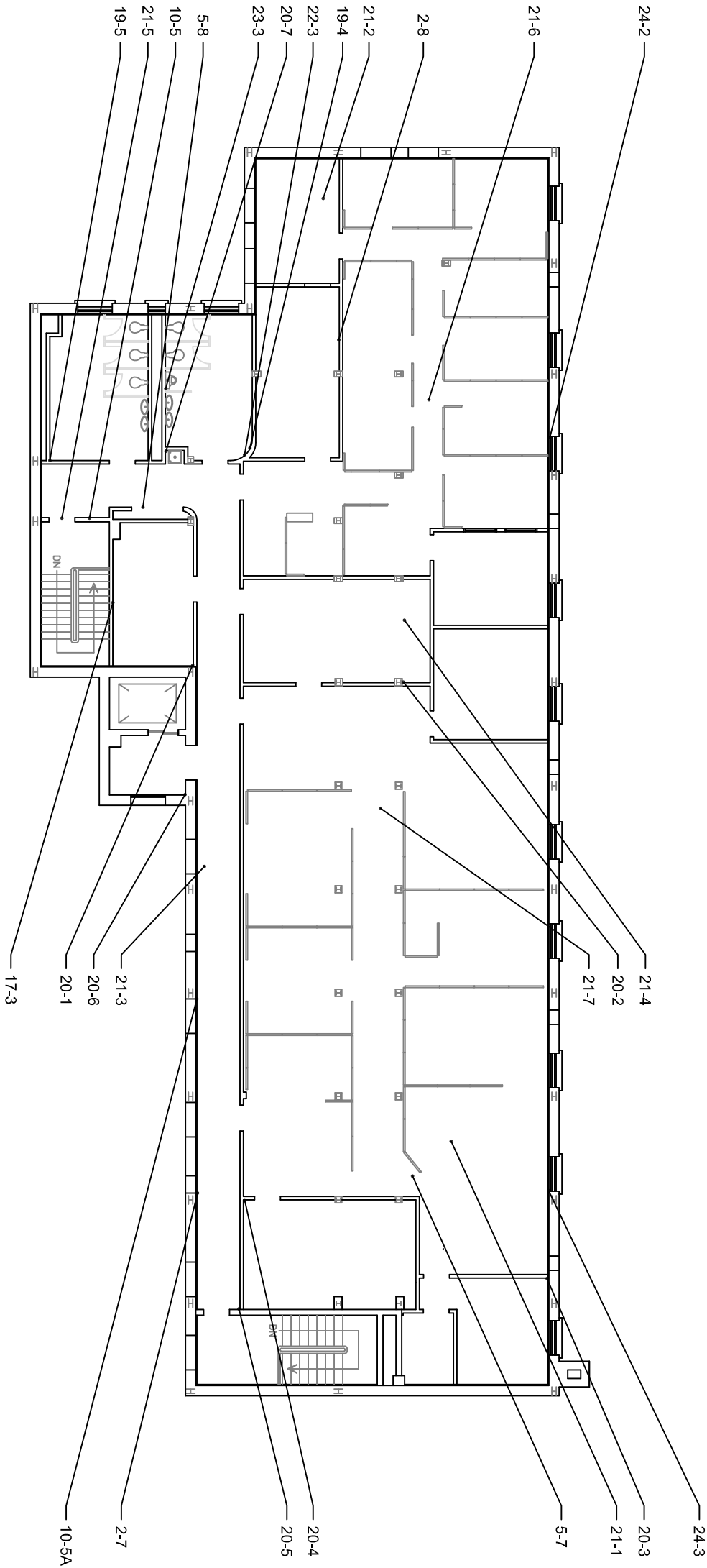
NOTES:

F&ME CONSULTANTS  
PROJECT NUMBER:

E5300.12

FIGURE NUMBER:

#8



THIRD FLOOR PLAN – 029A  
SCALE: 1/16" = 1.0'


DRWN. BY: N/A
CHKD. BY: JLS
APPR. BY: GME
NOTES:

ORIGINAL:
REVISIONS:
1
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SCALE
1/16" = 1.0'

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GEOTECHNICAL - ENVIRONMENTAL - MATERIALS  
COLUMBIA, SOUTH CAROLINA



University of South Carolina

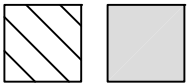
ASBESTOS CONTAINING MATERIALS INVESTIGATION  
1600 Hampton Street - Annex Building  
Columbia, South Carolina  
USC Project Number: H27-6052

F&ME CONSULTANTS  
PROJECT NUMBER:

E5300.12

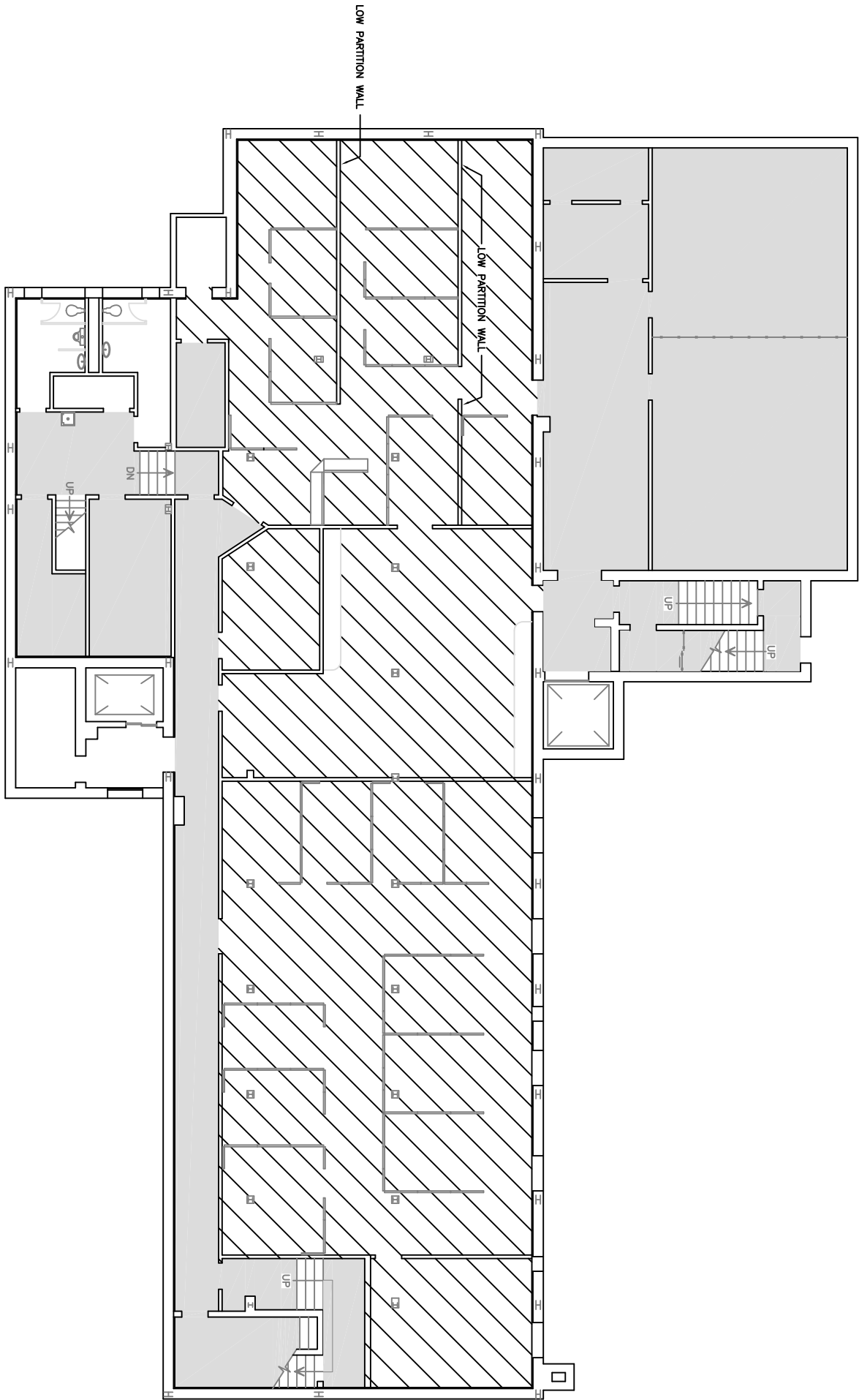
FIGURE NUMBER:

#9



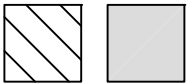
HA-1 Black Mastic Under non-ACM Beige 12" x 12" Floor Tile

HA-2 Residual Black Mastic Under Carpet



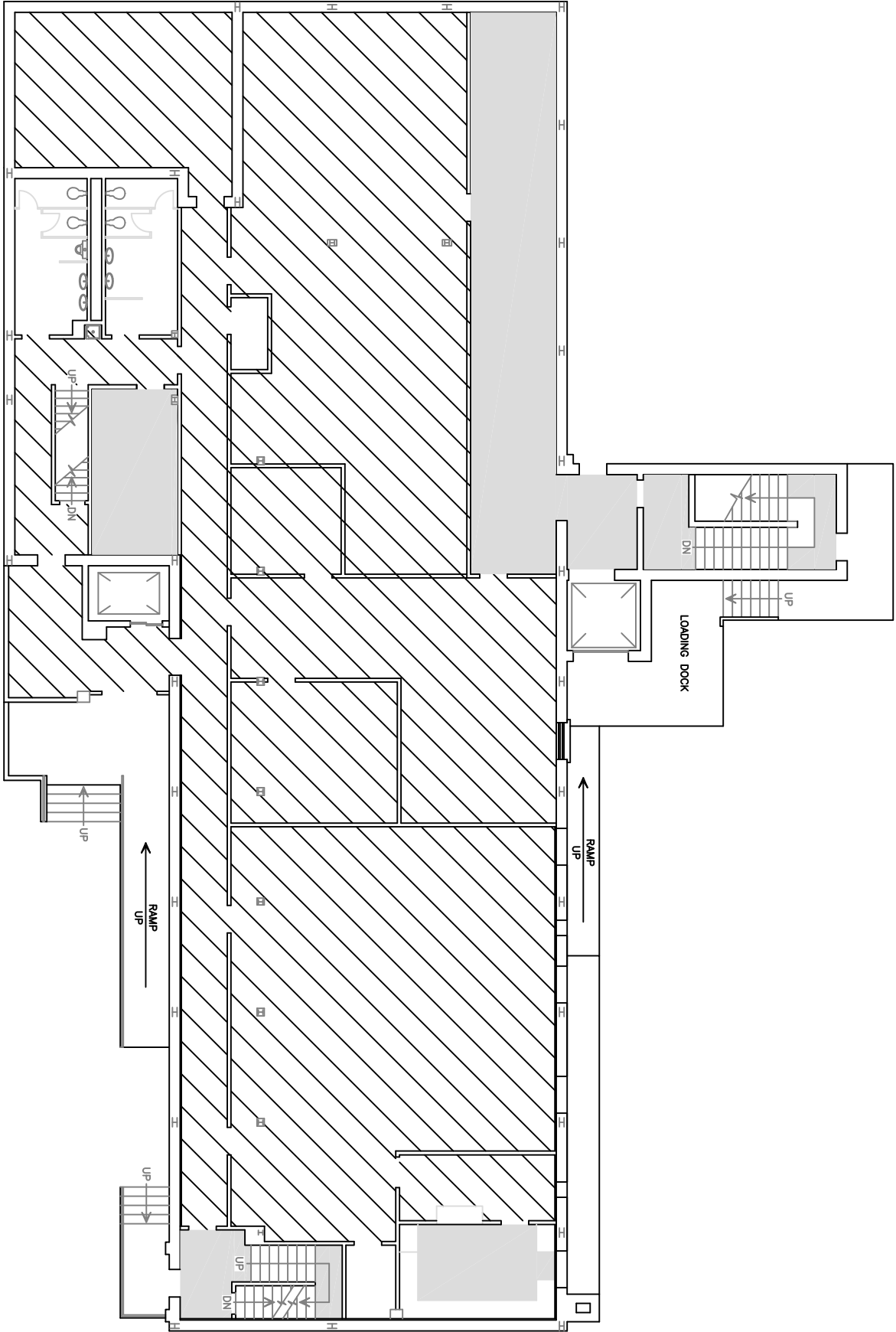
**BASEMENT FLOOR PLAN – 029A**  
SCALE: 1/16" = 1.0'





HA-1 Black Mastic Under non-ACM Beige 12" x 12" Floor Tile

HA-2 Residual Black Mastic Under Carpet



FIRST FLOOR PLAN – 029A  
SCALE: 1/16" = 1.0'

#11

FIGURE NUMBER:

F&ME CONSULTANTS  
PROJECT NUMBER:

E5300.12



HOMOGENEOUS AREA PLAN

University of South Carolina

ASBESTOS CONTAINING MATERIALS INVESTIGATION  
1600 Hampton Street - Annex Building  
Columbia, South Carolina  
USC Project Number: H27-6052

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CONSULTANTS

GEOTECHNICAL - ENVIRONMENTAL - MATERIALS  
COLUMBIA, SOUTH CAROLINA

ORIGINAL:

REVISIONS:

1

2

3

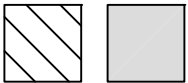
SCALE  
1/16" = 1.0'

DRWN. BY: N/A

CHKD. BY: JLS

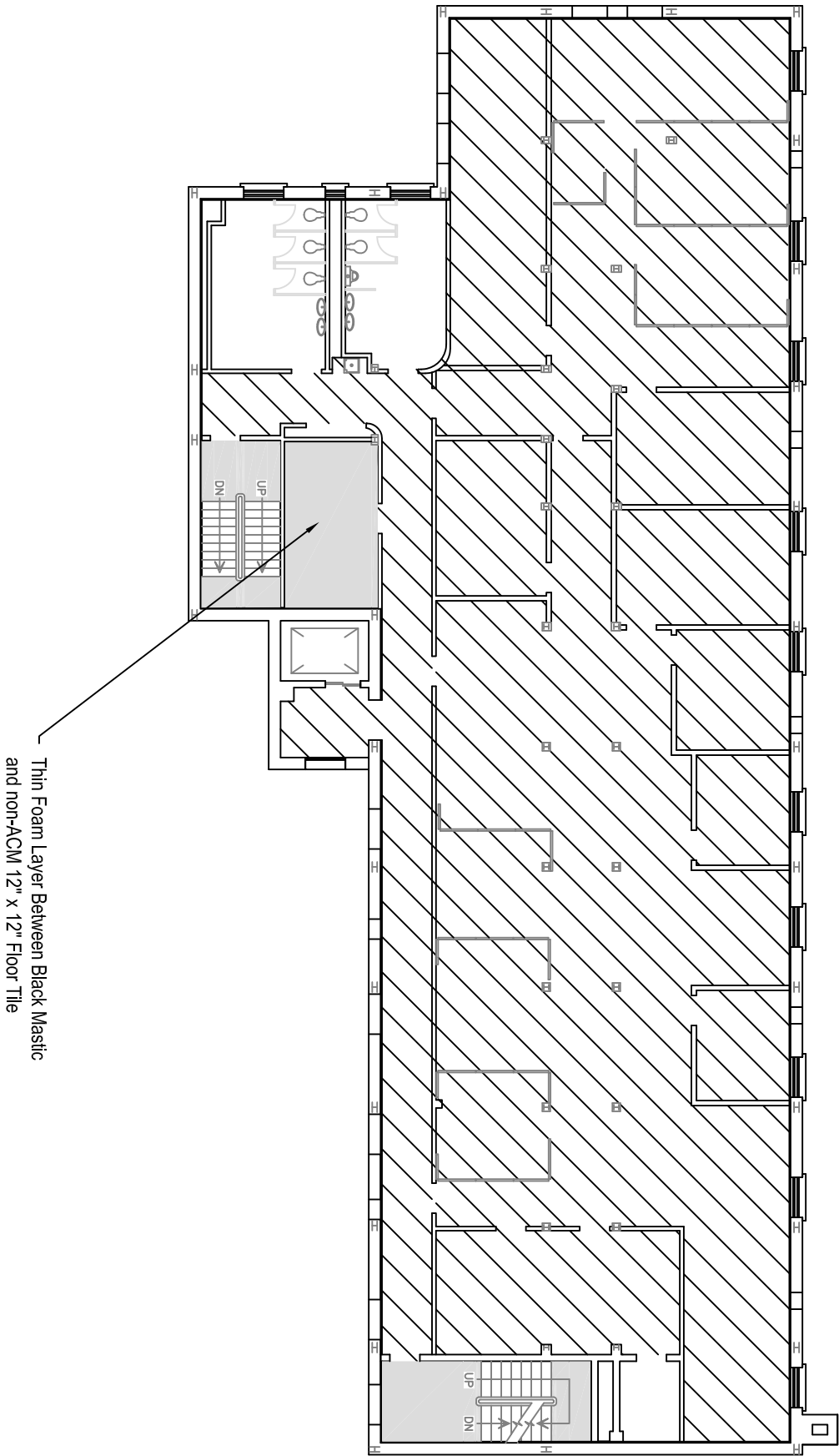
APPR. BY: GME

NOTES:



HA-1 Black Mastic Under non-ACM Beige 12" x 12" Floor Tile

HA-2 Residual Black Mastic Under Carpet



SECOND FLOOR PLAN – 029A

SCALE: 1/16" = 1.0'


DRWN. BY: N/A
CHKD. BY: JLS
APPR. BY: GME
NOTES:

ORIGINAL:
REVISIONS:
1
2
3
SCALE
1/16" = 1.0'

F&ME

CONSULTANTS

GEOTECHNICAL - ENVIRONMENTAL - MATERIALS  
COLUMBIA, SOUTH CAROLINA



**HOMOGENEOUS AREA PLAN**  
University of South Carolina

ASBESTOS CONTAINING MATERIALS INVESTIGATION  
1600 Hampton Street - Annex Building  
Columbia, South Carolina  
USC Project Number: H27-6052

F&ME CONSULTANTS  
PROJECT NUMBER:

E5300.12

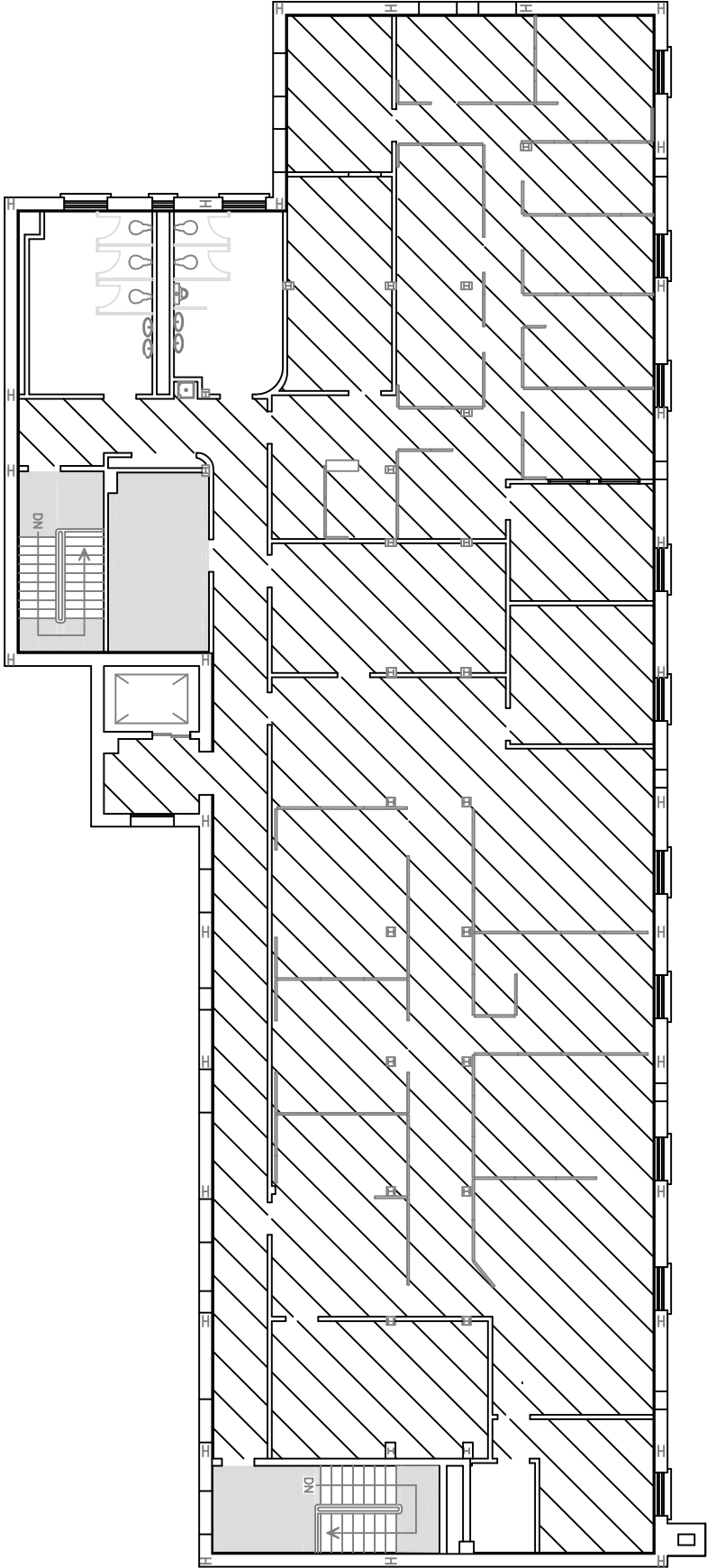
FIGURE NUMBER:

#12



HA-1 Black Mastic Under non-ACM Beige 12" x 12" Floor Tile

HA-2 Residual Black Mastic Under Carpet



THIRD FLOOR PLAN – 029A


SCALE: 1/16" = 1.0'

DRWN. BY: N/A
CHKD. BY: JLS
APPR. BY: GME
NOTES:

ORIGINAL:
REVISIONS:
1
2
3
SCALE
1/16" = 1.0'

F&ME  
CONSULTANTS

GEOTECHNICAL - ENVIRONMENTAL - MATERIALS  
COLUMBIA, SOUTH CAROLINA



**HOMOGENEOUS AREA PLAN**  
University of South Carolina

ASBESTOS CONTAINING MATERIALS INVESTIGATION  
1600 Hampton Street - Annex Building  
Columbia, South Carolina  
USC Project Number: H27-6052

F&ME CONSULTANTS  
PROJECT NUMBER:

E5300.12

FIGURE NUMBER:

#13

## **APPENDIX B**

Summary of Samples (Table I)

Summary of Asbestos Containing Materials (Table II)

Summary of Inspection

Physical Assessment Data Sheets

Bulk Asbestos Analytical Reports (F&ME)

Chain of Custody (F&ME)

Bulk Asbestos Analytical Reports (USC)

Chain of Custody (USC)



**TABLE I. SUMMARY OF SAMPLES**

<b>Sample ID</b>	<b>Sample Description</b>
1-1	Drywall/Joint Compound
1-2	Drywall/Joint Compound
1-3	Drywall/Joint Compound
1-4	Drywall/Joint Compound
1-5	Drywall/Joint Compound
1-6	Drywall/Joint Compound
1-7	Drywall/Joint Compound
2-1	Baseboard Adhesive
2-2	Baseboard Adhesive
2-3	Baseboard Adhesive
2-4	Baseboard Adhesive
2-5	Baseboard Adhesive
2-6	Baseboard Adhesive
2-7	Baseboard Adhesive
2-8	Baseboard Adhesive
3-1	2'x 4' Wavy Pattern Ceiling Panels
3-2	2'x 4' Wavy Pattern Ceiling Panels
3-3	2'x 4' Wavy Pattern Ceiling Panels
4-1	2'x 4' Replacement Ceiling Panels
4-2	2'x 4' Replacement Ceiling Panels
4-3	2'x 4' Replacement Ceiling Panels
5-1	Carpet Adhesive
5-2	Carpet Adhesive
5-3	Carpet Adhesive
5-4	Carpet Adhesive
5-5	Carpet Adhesive
5-6	Carpet Adhesive
5-7	Carpet Adhesive
5-8	Carpet Adhesive
6-1	Dark Gray Mastic on Metal Duct
6-2	Dark Gray Mastic on Metal Duct
6-3	Dark Gray Mastic on Metal Duct
7-1	Light Gray Mastic on Metal Duct
7-2	Light Gray Mastic on Metal Duct
7-3	Light Gray Mastic on Metal Duct
8-1	12"x 12" Beige w/ White/Gray Floor Tile & Mastic
8-2	12"x 12" Beige w/ White/Gray Floor Tile & Mastic
8-3	12"x 12" Beige w/ White/Gray Floor Tile & Mastic
9-1	Stair Tread Adhesive

**TABLE I**

**TABLE I. SUMMARY OF SAMPLES**

<b>Sample ID</b>	<b>Sample Description</b>
9-2	Stair Tread Adhesive
9-3	Stair Tread Adhesive
10-1	Plaster (Both Coats)
10-2	Plaster (Both Coats)
10-3	Plaster (Both Coats)
10-4	Plaster (Both Coats)
10-4A	Plaster (Both Coats)
10-5	Plaster (Both Coats)
10-5A	Plaster (Both Coats)
11-1	Tan Mastic on Metal Duct
11-2	Tan Mastic on Metal Duct
11-3	Tan Mastic on Metal Duct
12-1	2'x4' Gypsum Ceiling Panels
12-2	2'x4' Gypsum Ceiling Panels
12-3	2'x4' Gypsum Ceiling Panels
13-1	Drywall/Joint Compound
13-2	Drywall/Joint Compound
13-3	Drywall/Joint Compound
13-4	Drywall/Joint Compound
13-5	Drywall/Joint Compound
13-6	Drywall/Joint Compound
13-7	Drywall/Joint Compound
14-1	Red Fire Stop Caulking
14-2	Red Fire Stop Caulking
14-3	Red Fire Stop Caulking
15-1	Fire Resistant Board
15-2	Fire Resistant Board
15-3	Fire Resistant Board
16-1	Black Sink Undercoating
16-2	Black Sink Undercoating
16-3	Black Sink Undercoating
17-1	Brown Fire Stop Caulking
17-2	Brown Fire Stop Caulking
17-3	Brown Fire Stop Caulking
18-1	Drywall/Joint Compound
18-2	Drywall/Joint Compound
18-3	Drywall/Joint Compound
18-4	Drywall/Joint Compound
18-5	Drywall/Joint Compound

**TABLE I**

**TABLE I. SUMMARY OF SAMPLES**

<b>Sample ID</b>	<b>Sample Description</b>
18-6	Drywall/Joint Compound
18-7	Drywall/Joint Compound
19-1	Green Board/Joint Compound
19-2	Green Board/Joint Compound
19-3	Green Board/Joint Compound
19-4	Green Board/Joint Compound
19-5	Green Board/Joint Compound
20-1	Drywall/Joint Compound
20-2	Drywall/Joint Compound
20-3	Drywall/Joint Compound
20-4	Drywall/Joint Compound
20-5	Drywall/Joint Compound
20-6	Drywall/Joint Compound
20-7	Drywall/Joint Compound
21-1	Fire Rated Drywall/Joint Compound (Ceiling)
21-2	Fire Rated Drywall/Joint Compound (Ceiling)
21-3	Fire Rated Drywall/Joint Compound (Ceiling)
21-4	Fire Rated Drywall/Joint Compound (Ceiling)
21-5	Fire Rated Drywall/Joint Compound (Ceiling)
21-6	Fire Rated Drywall/Joint Compound (Ceiling)
21-7	Fire Rated Drywall/Joint Compound (Ceiling)
22-1	Bathroom Wall Tile Adhesive
22-2	Bathroom Wall Tile Adhesive
22-3	Bathroom Wall Tile Adhesive
23-1	White Caulking (Men's Bathroom)
23-2	White Caulking (Men's Bathroom)
23-3	White Caulking (Men's Bathroom)
24-1	Interior Window Caulking
24-2	Interior Window Caulking
24-3	Interior Window Caulking
25-1	Wall Texturing
25-2	Wall Texturing
25-3	Wall Texturing
26-1	Wall Texturing
26-2	Wall Texturing
26-3	Wall Texturing
26-3	Wall Texturing

**TABLE I**

**TABLE II. SUMMARY OF ASBESTOS CONTAINING MATERIALS**

Sample ID	Sample Description	Layer	% Asbestos
8-1	12" x12" Beige Floor Tile & Mastic	Floor Tile	Negative
		Mastic	8% Chrysotile
8-2	12" x12" Beige Floor Tile & Mastic	Floor Tile	Negative
		Mastic	First Positive Stop
8-3	12" x12" Beige Floor Tile & Mastic	Floor Tile	Negative
		Mastic	First Positive Stop

**TABLE II**

## **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

<u>Functional Space No.:</u>	<u>Functional Space Type:</u>
1.	H = Hallway
2.	MR = Mechanical Room
3.	E = Electrical Room
4.	S = Stairwell
5.	C = Communication Room
6.	O = Office

### **ACM CHARACTERISTICS:**

F = Friable

NF = Non-Friable

### **ASSESSMENT RESULTS:**

(Refer to Physical Assessment Data)

### **POTENTIAL FOR DISTURBANCE:**

(Refer to Physical Assessment Data)

**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)

<b><u>Hazard Rank</u></b>	<b><u>ACM Condition</u></b>	<b><u>ACM Disturbance Potential</u></b>
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

# PHYSICAL ASSESSMENT DATA SHEET

**Building:** 1600 Hampton Street Annex (#29a)

**Functional Space No:** 1, 2, 3, 4, 5, 6 **Type:** H, MR, E, S, C, O **Location:** (See Homogeneous Area Plan)

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

**Description:** HA-1 – Black Floor Tile Mastic under non-ACM Beige 12"x12" Floor Tile

**Approximate Amount of Material (SF or LF):** ~5,500 S.F.

**Condition:**

**Percent Damage:** X >0% \_\_\_\_\_ <10% \_\_\_\_\_ >10% \_\_\_\_\_ <25% \_\_\_\_\_ >25%

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

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

**Description:**

Asbestos-containing black mastic was found under the non-ACM 12" x 12" floor tiles of the subject building. Additionally, the mastic was found to be exposed in the basement mechanical room where the overlying floor tiles had been removed (see Photo 2). It is difficult to assess the overall condition of the mastic due to the overlying floor tiles. Where observed, this material appears to be intact and is in a non-friable condition. Prior to the start of renovation activities to the subject structure, this material and the non-ACM floor tiles must be removed and disposed of as ACM by a licensed abatement contractor.

**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:** Mike M. May **Date:** 08/26/2013

# PHYSICAL ASSESSMENT DATA SHEET

**Building:** 1600 Hampton Street Annex (#29a)

**Functional Space No:** 1, 6 **Type:** H, O **Location:** (See Homogeneous Area Plan)

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

**Description:** HA-2 – Residual Black Mastic under Carpet

**Approximate Amount of Material (SF or LF):** ~20,500 S.F.

## Condition:

**Percent Damage:** X >0% \_\_\_\_\_ <10% \_\_\_\_\_ >10% \_\_\_\_\_ <25% \_\_\_\_\_ >25%

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

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

## Description:

Residual asbestos-containing black mastic was found under carpet in the subject building. This material was most likely leftover from the removal of floor tiles during previous renovation activities. While analytical results obtained during this limited investigation indicate that the residual black mastic is found at <1% in the carpet adhesive, there is potential that patches of the mastic may be encountered during the removal of the overlying carpet. In an effort to further delineate the location of this residual mastic, USC's HAZMAT personnel performed some additional sampling. According to their laboratory results, the residual black mastic was found to be contaminating the carpet adhesive on all four (4) floors of the subject structure. Where observed, this material appears to be intact and is in a non-friable condition. Prior to the start of renovation activities to the subject structure, this material, the non-ACM carpet adhesive and overlying carpet must be removed and disposed of as ACM by a licensed abatement contractor.

**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:** Mike May **Date:** 08/26/2013



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 Analysis Date: 8/16/2013  
 Collected:

Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
1-1-Drywall 021304890-0001	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (other)	None Detected
1-1-Joint Compound 021304890-0001A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
1-2-Drywall 021304890-0002	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	None Detected
1-2-Joint Compound 021304890-0002A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	1% Cellulose	99% Non-fibrous (other)	None Detected
1-2-Tape 021304890-0002B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected
1-3-Drywall 021304890-0003	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	None Detected
1-3-Joint Compound 021304890-0003A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	1% Cellulose	99% Non-fibrous (other)	None Detected
1-3-Tape 021304890-0003B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected

Analyst(s)

James Cole (39)

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Stephen Bennett, Laboratory Manager  
or other approved signatory

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Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
1-4-Drywall 021304890-0004	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	10% Cellulose 1% Glass	89% Non-fibrous (other)	None Detected
1-4-Joint Compound 021304890-0004A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
1-4-Tape 021304890-0004B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected
1-5-Drywall 021304890-0005	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (other)	None Detected
1-5-Joint Compound 021304890-0005A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
1-6-Drywall 021304890-0006	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	8% Cellulose 1% Glass	91% Non-fibrous (other)	None Detected
1-6-Joint Compound 021304890-0006A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	1% Cellulose	99% Non-fibrous (other)	None Detected
1-6-Tape 021304890-0006B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected

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Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
1-7-Drywall 021304890-0007	Drywall/Joint Compound	Brown/Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (other)	<b>None Detected</b>
1-7-Joint Compound 021304890-0007A	Drywall/Joint Compound	White Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
1-7-Tape 021304890-0007B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
2-1 021304890-0008	Baseboard Adhesive	Gold Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
2-2 021304890-0009	Baseboard Adhesive	Yellow/Gold Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
2-3 021304890-0010	Baseboard Adhesive	Gold Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
2-4 021304890-0011	Baseboard Adhesive	Yellow/Gold Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
2-5 021304890-0012	Baseboard Adhesive	Brown/Tan/Gold Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
2-6 021304890-0013	Baseboard Adhesive	Yellow/Gold Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
2-7 021304890-0014	Baseboard Adhesive	Tan Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
3-1 021304890-0015	Ceiling Panels	Gray/White Fibrous Heterogeneous	40% Min. Wool 30% Cellulose	30% Non-fibrous (other)	None Detected
3-2 021304890-0016	Ceiling Panels	Gray/White Fibrous Heterogeneous	40% Min. Wool 30% Cellulose	30% Non-fibrous (other)	None Detected
3-3 021304890-0017	Ceiling Panels	Gray/White Fibrous Homogeneous	40% Min. Wool 30% Cellulose	30% Non-fibrous (other)	None Detected
4-1 021304890-0018	Ceiling Panels	Gray/Tan/White Fibrous Heterogeneous	45% Cellulose 15% Min. Wool	40% Non-fibrous (other)	None Detected
4-2 021304890-0019	Ceiling Panels	Gray/White Fibrous Heterogeneous	55% Cellulose 2% Glass	43% Non-fibrous (other)	None Detected
4-3 021304890-0020	Ceiling Panels	Gray/White Fibrous Homogeneous	45% Cellulose	55% Non-fibrous (other)	None Detected

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
5-1 021304890-0021	Carpet Adhesive	Tan/Gold Non-Fibrous Homogeneous	<1% Cellulose <1% Synthetic	100% Non-fibrous (other)	None Detected
5-2 021304890-0022	Carpet Adhesive	Yellow/Gold Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
5-3 021304890-0023	Carpet Adhesive	Tan/Gold/Orange Non-Fibrous Heterogeneous	1% Synthetic <1% Cellulose	99% Non-fibrous (other)	None Detected
5-4 021304890-0024	Carpet Adhesive	Tan/Yellow Non-Fibrous Homogeneous	3% Synthetic <1% Cellulose	97% Non-fibrous (other)	None Detected
5-5 021304890-0025	Carpet Adhesive	Tan/Black/Orange Non-Fibrous Heterogeneous	<1% Cellulose <1% Synthetic	100% Non-fibrous (other)	None Detected
5-6 021304890-0026	Carpet Adhesive	Black/Green/Gold Non-Fibrous Heterogeneous	2% Cellulose 2% Synthetic	96% Non-fibrous (other)	None Detected
5-7 021304890-0027	Carpet Adhesive	Tan/Black Non-Fibrous Homogeneous	<1% Cellulose <1% Synthetic	100% Non-fibrous (other)	None Detected
6-1 021304890-0028	Mastic on Metal Duct	Gray Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected

Analyst(s)

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

Sample	Description	Appearance	Non-Asbestos		Asbestos	
			% Fibrous	% Non-Fibrous	% Type	
6-2 021304890-0029	Mastic on Metal Duct	Gray Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)		None Detected
7-1 021304890-0030	Mastic on Metal Duct	Gray Fibrous Homogeneous	5% Glass <1% Cellulose	95% Non-fibrous (other)		None Detected
7-2 021304890-0031	Mastic on Metal Duct	Gray Non-Fibrous Homogeneous	5% Glass	95% Non-fibrous (other)		None Detected
8-1-Floor Tile 021304890-0032	Floor Tile & Mastic	Beige/Grayish Non-Fibrous Homogeneous		100% Non-fibrous (other)		None Detected
8-1-Mastic 021304890-0032A	Floor Tile & Mastic	Black Fibrous Homogeneous	2% Cellulose	90% Non-fibrous (other)		8% Chrysotile
8-2-Floor Tile 021304890-0033	Floor Tile & Mastic	Beige Non-Fibrous Homogeneous		100% Non-fibrous (other)		None Detected
8-2-Mastic 021304890-0033A	Floor Tile & Mastic					Stop Positive (Not Analyzed)
9-1 021304890-0034	Stair Tread Adhesive	Brown/Tan/Black Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)		<1% Chrysotile
9-2 021304890-0035	Stair Tread Adhesive	Black Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)		None Detected

## Analyst(s)

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Scott Combs (145)

Stephen Bennett, Laboratory Manager  
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ProjectID:

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Phone: (803) 254-4540  
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Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
10-1 021304890-0036	Plaster	Gray/Tan/White Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
No Discernible Layers, Plaster With Paint.					
10-2-Skim Coat 021304890-0037	Plaster	Gray/Yellow/Green Non-Fibrous Heterogeneous		100% Non-fibrous (other)	<b>None Detected</b>
10-2-Rough Coat 021304890-0037A	Plaster	Tan/Grayish Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
10-3-Skim Coat 021304890-0038	Plaster	Gray/Yellow/Green Non-Fibrous Heterogeneous		100% Non-fibrous (other)	<b>None Detected</b>
10-3-Rough Coat 021304890-0038A	Plaster	Tan/Grayish Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
10-4-Skim Coat 021304890-0039	Plaster	Gray/White/Green Non-Fibrous Heterogeneous		100% Non-fibrous (other)	<b>None Detected</b>
10-4-Rough Coat 021304890-0039A	Plaster	Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
10-4A-Skim Coat 021304890-0040	Plaster	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	<b>None Detected</b>

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Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
10-4A-Rough Coat 021304890-0040A	Plaster	Beige Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
10-5-Skim Coat 021304890-0041	Plaster	White/Green/Olive Non-Fibrous Heterogeneous		100% Non-fibrous (other)	None Detected
10-5-Rough Coat 021304890-0041A	Plaster	Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
10-5A-Skim Coat 021304890-0042	Plaster	White/Green/Olive Non-Fibrous Heterogeneous		100% Non-fibrous (other)	None Detected
10-5A-Rough Coat 021304890-0042A	Plaster	Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
11-1 021304890-0043	Mastic on Metal Duct	White/Grayish Non-Fibrous Homogeneous	1% Cellulose <1% Fibrous (other)	99% Non-fibrous (other)	None Detected
11-2 021304890-0044	Mastic on Metal Duct	Gray Fibrous Homogeneous	5% Glass <1% Fibrous (other)	95% Non-fibrous (other)	None Detected
12-1 021304890-0045	Ceiling Panels	Brown/Gray Fibrous Heterogeneous	4% Cellulose 2% Glass	94% Non-fibrous (other)	None Detected

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Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
12-2 021304890-0046	Ceiling Panels	Gray Non-Fibrous Homogeneous	2% Glass <1% Cellulose	98% Non-fibrous (other)	None Detected
12-3 021304890-0047	Ceiling Panels	Brown/Gray Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (other)	None Detected
13-1-Drywall 021304890-0048	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	30% Cellulose 1% Glass	69% Non-fibrous (other)	None Detected
13-1-Joint Compound 021304890-0048A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
13-1-Tape 021304890-0048B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected
13-2-Drywall 021304890-0049	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	10% Cellulose 1% Glass	89% Non-fibrous (other)	None Detected
13-2-Joint Compound 021304890-0049A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
13-2-Tape 021304890-0049B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected

Analyst(s)

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Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
13-3-Drywall 021304890-0050	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	10% Cellulose 1% Glass	89% Non-fibrous (other)	None Detected
13-3-Joint Compound 021304890-0050A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
13-3-Tape 021304890-0050B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected
13-4-Drywall 021304890-0051	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	10% Cellulose 1% Glass	89% Non-fibrous (other)	None Detected
13-4-Joint Compound 021304890-0051A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
13-4-Tape 021304890-0051B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected
13-5-Joint Compound 021304890-0052	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
No Drywall Present.					
13-5-Tape 021304890-0052A	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected

## Analyst(s)

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Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
13-6-Drywall 021304890-0053	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	<b>None Detected</b>
13-6-Joint Compound 021304890-0053A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
13-6-Tape 021304890-0053B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
13-7-Drywall 021304890-0054	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	10% Cellulose	90% Non-fibrous (other)	<b>None Detected</b>
13-7-Joint Compound 021304890-0054A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
13-7-Tape 021304890-0054B	Drywall/Joint Compound	Beige Fibrous Heterogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
14-1 021304890-0055	Caulking	Red/Black Fibrous Heterogeneous	5% Glass <1% Cellulose	95% Non-fibrous (other)	<b>None Detected</b>
14-2 021304890-0056	Caulking	Red/Black Fibrous Heterogeneous	5% Glass <1% Cellulose	95% Non-fibrous (other)	<b>None Detected</b>

Analyst(s)

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
15-1 021304890-0057	Fire Resistant Board	Gray/Tan Fibrous Homogeneous	45% Min. Wool 10% Cellulose	45% Non-fibrous (other)	None Detected
15-2 021304890-0058	Fire Resistant Board	Gray/Tan Fibrous Homogeneous	45% Min. Wool 10% Cellulose	45% Non-fibrous (other)	None Detected
15-3 021304890-0059	Fire Resistant Board	Gray/Tan Fibrous Heterogeneous	45% Min. Wool 10% Cellulose	45% Non-fibrous (other)	None Detected
16-1 021304890-0060	Sink Undercoating	Black Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
16-2 021304890-0061	Sink Undercoating	Black Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
17-1 021304890-0062	Caulking	Brown/Tan Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
17-2 021304890-0063	Caulking	Brown Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
18-1-Joint Compound 021304890-0064	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected

No Drywall Present.

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
18-1-Tape 021304890-0064A	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
18-2-Drywall Paper 021304890-0065	Drywall/Joint Compound	Brown Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
No Grey Layer Present.					
18-2-Joint Compound 021304890-0065A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
18-2-Tape 021304890-0065B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
18-3-Drywall 021304890-0066	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	5% Cellulose 1% Glass	94% Non-fibrous (other)	<b>None Detected</b>
18-3-Joint Compound 021304890-0066A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
18-3-Tape 021304890-0066B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
18-4-Drywall 021304890-0067	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	<b>None Detected</b>

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CustomerID: FMEC62

CustomerPO: E5300.12

ProjectID:

Attn: **Glynn Ellen**  
**F & ME Consultants**  
**3112 Divine Street**

**Columbia, SC 29205**

Phone: (803) 254-4540  
 Fax: (803) 254-4542  
 Received: 08/09/13 10:00 AM  
 Analysis Date: 8/16/2013  
 Collected:

Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
18-4-Joint Compound 021304890-0067A	Drywall/Joint Compound	White Non-Fibrous  Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
18-4-Tape 021304890-0067B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
18-5-Drywall 021304890-0068	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	<b>None Detected</b>
18-5-Joint Compound 021304890-0068A	Drywall/Joint Compound	White Non-Fibrous  Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
18-5-Tape 021304890-0068B	Drywall/Joint Compound	Beige Non-Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
18-6-Drywall 021304890-0069	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	<b>None Detected</b>
18-6-Joint Compound 021304890-0069A	Drywall/Joint Compound	White Non-Fibrous  Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
18-6-Tape 021304890-0069B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>

Analyst(s)

James Cole (39)

Scott Combs (145)

Stephen Bennett, Laboratory Manager  
or other approved signatory

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Report Amended: 08/16/2013 13:49:02 Replaces the Initial Report 08/14/2013 08:18:35. Reason Code: Client-Additional Analysis

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
18-7-Drywall 021304890-0070	Drywall/Joint Compound	Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (other)	None Detected
18-7-Joint Compound 021304890-0070A	Drywall/Joint Compound	White Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
18-7-Tape 021304890-0070B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected
19-1-Drywall 021304890-0071	Green Board/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	None Detected
19-1-Joint Compound 021304890-0071A	Green Board/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
19-1-Tape 021304890-0071B	Green Board/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected
19-2-Drywall 021304890-0072	Green Board/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	None Detected
19-2-Joint Compound 021304890-0072A	Green Board/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected

## Analyst(s)

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Scott Combs (145)

Stephen Bennett, Laboratory Manager  
or other approved signatory

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Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
19-2-Tape 021304890-0072B	Green Board/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
19-3-Drywall 021304890-0073	Green Board/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	<b>None Detected</b>
19-3-Joint Compound 021304890-0073A	Green Board/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
19-3-Tape 021304890-0073B	Green Board/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
19-4-Drywall 021304890-0074	Green Board/Joint Compound	Brown/Gray/Green Fibrous Heterogeneous	10% Cellulose 2% Glass	88% Non-fibrous (other)	<b>None Detected</b>
19-4-Joint Compound 021304890-0074A	Green Board/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
19-4-Tape 021304890-0074B	Green Board/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
19-5-Drywall 021304890-0075	Green Board/Joint Compound	Brown/Gray Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (other)	<b>None Detected</b>

Analyst(s)

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Stephen Bennett, Laboratory Manager  
or other approved signatory

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Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	Non-Asbestos		Asbestos	
			% Fibrous	% Non-Fibrous	% Type	
19-5-Joint Compound 021304890-0075A	Green Board/Joint Compound	White Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)		None Detected
19-5-Tape 021304890-0075B	Green Board/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)		None Detected
20-1-Drywall 021304890-0076	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	5% Cellulose 1% Glass	94% Non-fibrous (other)		None Detected
20-1-Joint Compound 021304890-0076A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)		None Detected
20-1-Tape 021304890-0076B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)		None Detected
20-2-Drywall 021304890-0077	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)		None Detected
20-2-Joint Compound 021304890-0077A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)		None Detected
20-2-Tape 021304890-0077B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)		None Detected

## Analyst(s)

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 Scott Combs (145)

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 or other approved signatory

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Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
20-3-Drywall 021304890-0078	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	<b>None Detected</b>
20-3-Joint Compound 021304890-0078A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
20-3-Tape 021304890-0078B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
20-4-Drywall 021304890-0079	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	<b>None Detected</b>
20-4-Joint Compound 021304890-0079A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
20-4-Tape 021304890-0079B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
20-5-Drywall 021304890-0080	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	5% Cellulose 1% Glass	94% Non-fibrous (other)	<b>None Detected</b>
20-5-Joint Compound 021304890-0080A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>

Analyst(s)

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
20-5-Tape 021304890-0080B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
20-6-Drywall 021304890-0081	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	<b>None Detected</b>
20-6-Joint Compound 021304890-0081A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
20-6-Tape 021304890-0081B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
20-7-Drywall 021304890-0082	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	10% Cellulose	90% Non-fibrous (other)	<b>None Detected</b>
20-7-Joint Compound 021304890-0082A	Drywall/Joint Compound	White Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
20-7-Tape 021304890-0082B	Drywall/Joint Compound	Beige Fibrous Heterogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
21-1-Drywall 021304890-0083	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	8% Cellulose 1% Glass	91% Non-fibrous (other)	<b>None Detected</b>

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
21-1-Joint Compound 021304890-0083A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
21-1-Tape 021304890-0083B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected
21-2-Drywall 021304890-0084	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	5% Cellulose 1% Glass	94% Non-fibrous (other)	None Detected
21-2-Joint Compound 021304890-0084A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
21-2-Tape 021304890-0084B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected
21-3-Drywall 021304890-0085	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	15% Cellulose 1% Glass	84% Non-fibrous (other)	None Detected
21-3-Joint Compound 021304890-0085A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
21-3-Tape 021304890-0085B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
21-4-Drywall 021304890-0086	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	5% Cellulose 1% Glass	94% Non-fibrous (other)	<b>None Detected</b>
21-4-Joint Compound 021304890-0086A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
21-4-Tape 021304890-0086B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
21-5-Drywall 021304890-0087	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	8% Cellulose 1% Glass	91% Non-fibrous (other)	<b>None Detected</b>
21-5-Joint Compound 021304890-0087A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>
21-5-Tape 021304890-0087B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	<b>None Detected</b>
21-6-Drywall 021304890-0088	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	5% Cellulose 1% Glass	94% Non-fibrous (other)	<b>None Detected</b>
21-6-Joint Compound 021304890-0088A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	<b>None Detected</b>

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Scott Combs (145)

Stephen Bennett, Laboratory Manager  
 or other approved signatory

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 Samples analyzed by EMSL Analytical, Inc. Kernersville, NC NVLAP Lab Code 102104-0, CA ELAP 2689, Virginia 3333-000228, West Virginia LT000321

Report Amended: 08/16/2013 13:49:02 Replaces the Initial Report 08/14/2013 08:18:35. Reason Code: Client-Additional Analysis

**EMSL Analytical, Inc.**

706 Galin Street, Kernersville, NC 27284

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

<http://www.EMSL.com>[greensborolab@emsl.com](mailto:greensborolab@emsl.com)

EMSL Order: 021304890

CustomerID: FMEC62

CustomerPO: E5300.12

ProjectID:

Attn: **Glynn Ellen**  
**F & ME Consultants**  
**3112 Divine Street**

**Columbia, SC 29205**

Phone: (803) 254-4540  
Fax: (803) 254-4542  
Received: 08/09/13 10:00 AM  
Analysis Date: 8/16/2013  
Collected:

Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	<u>Non-Asbestos</u>		<u>Asbestos</u>
			% Fibrous	% Non-Fibrous	% Type
21-6-Tape 021304890-0088B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected
21-7-Drywall 021304890-0089	Drywall/Joint Compound	Brown/Gray Fibrous Heterogeneous	10% Cellulose 1% Glass	89% Non-fibrous (other)	None Detected
21-7-Joint Compound 021304890-0089A	Drywall/Joint Compound	White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
21-7-Tape 021304890-0089B	Drywall/Joint Compound	Beige Fibrous Homogeneous	100% Cellulose	0% Non-fibrous (other)	None Detected
22-1 021304890-0090	Tile Adhesive	Gold Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
22-2 021304890-0091	Tile Adhesive	Tan Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
23-1 021304890-0092	Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
23-2 021304890-0093	Caulking	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected

## Analyst(s)

James Cole (39)

Scott Combs (145)

Stephen Bennett, Laboratory Manager  
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Kernersville, NC NVLAP Lab Code 102104-0, CA ELAP 2689, Virginia 3333-000228, West Virginia LT000321

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CustomerID: FMEC62

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Attn: **Glynn Ellen**  
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**Columbia, SC 29205**

Phone: (803) 254-4540  
Fax: (803) 254-4542  
Received: 08/09/13 10:00 AM  
Analysis Date: 8/16/2013  
Collected:

Project: **E5300.12 Limited ACM Investigation - 1600 Hampton Street Annex**

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
24-1 021304890-0094	Window Caulking	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
24-2 021304890-0095	Window Caulking	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
25-1 021304890-0096	Wall Texturing	Gray/White Non-Fibrous Heterogeneous		100% Non-fibrous (other)	None Detected
25-2 021304890-0097	Wall Texturing	Gray/White Non-Fibrous Heterogeneous		100% Non-fibrous (other)	None Detected
25-3 021304890-0098	Wall Texturing	Brown/Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
26-1 021304890-0099	Wall Texturing	Gray/Green/Beige Non-Fibrous Heterogeneous	<1% Cellulose <1% Glass	100% Non-fibrous (other)	None Detected
26-2 021304890-0100	Wall Texturing	Gray/White Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected
26-3 021304890-0101	Wall Texturing	Gray/Green/Beige Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected

## Analyst(s)

James Cole (39)  
Scott Combs (145)

Stephen Bennett, Laboratory Manager  
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Kernersville, NC NVLAP Lab Code 102104-0, CA ELAP 2689, Virginia 3333-000228, West Virginia LT000321

Report Amended: 08/16/2013 13:49:02 Replaces the Initial Report 08/14/2013 08:18:35. Reason Code: Client-Additional Analysis



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EMSL Order: 021304890

CustomerID: FMEC62

CustomerPO: E5300.12

ProjectID:

Attn: **Glynn Ellen**  
**F & ME Consultants**  
**3112 Divine Street**

**Columbia, SC 29205**

Phone: (803) 254-4540  
Fax: (803) 254-4542  
Received: 08/21/13 1:00 PM  
Analysis Date: 8/22/2013  
Collected:

Project: **E5300.12 Limited ACM Investigatiom - 1600 Hampton Street Annex**

## 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
2-8 021304890-0102	Baseboard Adhesive	Tan Non-Fibrous Homogeneous	100	None	No Asbestos Detected
5-8 021304890-0103	Carpet Adhesive	Tan /Black Non-Fibrous Heterogeneous	100	None	<0.25% Chrysotile
6-3 021304890-0104	Dark gray mastic	Gray Non-Fibrous Heterogeneous	100	None	No Asbestos Detected
7-3 021304890-0105	Light gray mastic	Gray Non-Fibrous Heterogeneous	100	None	No Asbestos Detected
8-3 021304890-0106	Floor Tile	Gray /Beige Non-Fibrous Heterogeneous	100	None	No Asbestos Detected
9-3 021304890-0107	Stair tread adhesive	Black Non-Fibrous Heterogeneous	100	None	No Asbestos Detected
11-3 021304890-0108	Mastic	Beige Non-Fibrous Heterogeneous	100	None	No Asbestos Detected
14-3 021304890-0109	Red fire stop caulking	Red Non-Fibrous Heterogeneous	100	None	No Asbestos Detected
16-3 021304890-0110	Black sink undercoating	Black Non-Fibrous Heterogeneous	100	None	No Asbestos Detected

Analyst(s)

Stephen Bennett (13)

Scott Combs (1)

Stephen Bennett, Laboratory Manager  
or other approved signatory

This laboratory is not responsible for % asbestos in total sample when the residue only is submitted for analysis. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.

Samples analyzed by EMSL Analytical, Inc. Kernersville, NC

Report Amended: 08/22/2013 09:29:27 Replaces the Initial Report 08/15/2013 10:13:29. Reason Code: Client-Additional Analysis



**EMSL Analytical, Inc.**

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

<http://www.EMSL.com>[greensborolab@emsl.com](mailto:greensborolab@emsl.com)

EMSL Order: 021304890

CustomerID: FMEC62

CustomerPO: E5300.12

ProjectID:

Attn: **Glynn Ellen**  
**F & ME Consultants**  
**3112 Divine Street**

**Columbia, SC 29205**

Phone: (803) 254-4540  
Fax: (803) 254-4542  
Received: 08/21/13 1:00 PM  
Analysis Date: 8/22/2013  
Collected:

Project: **E5300.12 Limited ACM Investigatiom - 1600 Hampton Street Annex**

### 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
17-3 021304890-0111	Brown fire stop caulking	Brown /Black Non-Fibrous Heterogeneous	100	None	No Asbestos Detected
22-3 021304890-0112	Adhesive	Tan Non-Fibrous Heterogeneous	100	None	No Asbestos Detected
23-3 021304890-0113	Caulking	White Non-Fibrous Heterogeneous	100	None	No Asbestos Detected
24-3 021304890-0114	Caulking	Black Non-Fibrous Heterogeneous	100	None	No Asbestos Detected
5-6 Carpet Adhesive 021304890-0115	Carpet Adhesive	Tan /Black /Green Non-Fibrous Heterogeneous	100	None	No Asbestos Detected

Analyst(s)

Stephen Bennett (13)

Scott Combs (1)

Stephen Bennett, Laboratory Manager  
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Kernersville, NC

Report Amended: 08/22/2013 09:29:27 Replaces the Initial Report 08/15/2013 10:13:29. Reason Code: Client-Additional Analysis

## Chain of Custody

## Asbestos Lab Services

4890 EMSL Analytical, Inc.  
706 Gralin Street  
Kernersville, NC 27284

Phone: (336) 992-1025  
Fax: (336) 992-4175  
<http://www.emsl.com>

Please print all information legibly.

<b>Company:</b>	F&ME Consultants	<b>Bill To:</b>	F&ME Consultants
<b>Address1:</b>	3112 Devine Street	<b>Address1:</b>	P.O. Box 5855
<b>Address2:</b>		<b>Address2:</b>	
<b>City, State:</b>	Columbia, South Carolina	<b>City, State:</b>	Columbia, South Carolina
<b>Zip/Post Code:</b>	29205	<b>Zip/Post Code:</b>	29250
<b>Country:</b>	USA	<b>Country:</b>	USA
<b>Contact Name:</b>	Glynn Ellen	<b>Attn:</b>	Jim Kelleher
<b>Phone:</b>	803 254-4540	<b>Phone:</b>	803 777-1208
<b>Fax:</b>	803 254-4542	<b>Fax:</b>	803 777-1028
<b>Email:</b>	mmincey@fmecon.com; jshannon@fmecon.com	<b>Email:</b>	jkelleher@fmecon.com
<b>EMSL Rep:</b>	Jason McDonald	<b>P.O. Number:</b>	E5300.12
<b>Project Name/Number:</b>	E5300.12 Limited ACM Investigation-1600 Hampton Street Annex		

MATRIX			TURNAROUND			
<input type="checkbox"/> Air	<input type="checkbox"/> Soil	<input type="checkbox"/> Micro-Vac	<input type="checkbox"/> 3 Hours	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> Same Day or 12 Hours*	<input type="checkbox"/> 24 Hours (1day)
<input checked="" type="checkbox"/> Bulk	<input type="checkbox"/> Drinking Water		<input type="checkbox"/> 48 Hours (2 days)	<input checked="" type="checkbox"/> 72 Hours (3 days)	<input checked="" type="checkbox"/> 96 Hours (4 days)	<input type="checkbox"/> 120 Hours (5 days)
<input type="checkbox"/> Wipe	<input type="checkbox"/> Wastewater		<input type="checkbox"/> 144+ hours (6-10 days)			

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3-hour tat, please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign an authorization form for this service.

\*12 hours (must arrive by 11:00a.m. Mon -Fri.), Please Refer to Price Quote

PCM - Air	TEM Air	TEM WATER
<input type="checkbox"/> NIOSH 7400(A) Issue 2: August 1994	<input type="checkbox"/> AHERA 40 CFR, Part 763 Subpart E	<input type="checkbox"/> EPA 100.1
<input type="checkbox"/> OSHA w/TWA	<input type="checkbox"/> NIOSH 7402	<input type="checkbox"/> EPA 100.2
<input type="checkbox"/> Other:	<input type="checkbox"/> EPA Level II	<input type="checkbox"/> NYS 198.2
<b>PLM - Bulk</b>	<b>TEM BULK</b>	<b>TEM Microvac/Wipe</b>
<input checked="" type="checkbox"/> EPA 600/R-93/116 <i>mw</i>	<input type="checkbox"/> Drop Mount (Qualitative)	<input type="checkbox"/> ASTM D 5755-95 (quantative method)
<input type="checkbox"/> EPA Point Count	<input type="checkbox"/> Chatfield SOP - 1988-02	<input type="checkbox"/> Wipe Qualitative
<input type="checkbox"/> NY Stratified Point Count	<input checked="" type="checkbox"/> TEM NOB (Gravimetric) NYS 198.4	
<input type="checkbox"/> PLM NOB (Gravimetric) NYS 198.1	<input type="checkbox"/> EMSL Standard Addition:	<b>XRD</b>
<input type="checkbox"/> NIOSH 9002:		<input type="checkbox"/> Asbestos
<input type="checkbox"/> EMSL Standard Addition:	<b>PLM Soil</b>	<input type="checkbox"/> Silica NIOSH 7500
<b>SEM Air or Bulk</b>	<input type="checkbox"/> EPA Protocol Qualitative	
<input type="checkbox"/> Qualitative	<input type="checkbox"/> EPA Protocol Quantitative	<b>OTHER</b>
<input type="checkbox"/> Quantitative	<input type="checkbox"/> EMSL MSD 9000 Method fibers/gram	<input type="checkbox"/>

Fee Ex 8018 3811 4139

4890



# Chain of Custody

## Asbestos Lab Services

EMSL Analytical, Inc.  
706 Gralin Street  
Kernersville, NC 27284

Phone: (336) 992-1025  
Fax: (336) 992-4175  
<http://www.emsl.com>

Please print all information legibly.

Client Sample # 1-1 to 26-3

Total Samples # 115

Relinquished: Mike Mincey *Mike Mincey* Date: 08/08/13

Time: 17:00

Received: *mv* Date: 8/9/13

Time: 10:00

Relinquished: \_\_\_\_\_ Date: \_\_\_\_\_

Time: \_\_\_\_\_

Received: \_\_\_\_\_ Date: \_\_\_\_\_

Time: \_\_\_\_\_

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME (if applicable)
<b>NOTE: FIRST POSITIVE STOP PROTOCOL. ALSO, FOR SAMPLES DENOTED WITH AN ASTERICK (*), IF THE FIRST TWO SAMPLES' RESULTS ARE NEGATIVE, RUN LAST SAMPLE AS TEM BULK FOR NEGATIVE CONFIRMATION. SOUTH CAROLINA GUIDELINES.</b>		
1-1	Drywall/Joint Compound	Basement
1-2	Drywall/Joint Compound	Basement
1-3	Drywall/Joint Compound	Basement
1-4	Drywall/Joint Compound	Basement
1-5	Drywall/Joint Compound	Basement
1-6	Drywall/Joint Compound	Basement
1-7	Drywall/Joint Compound	Basement
2-1	Baseboard Adhesive	Basement
2-2	Baseboard Adhesive	Basement
2-3	Baseboard Adhesive	1 <sup>st</sup> Floor
2-4	Baseboard Adhesive	1 <sup>st</sup> Floor
2-5	Baseboard Adhesive	2 <sup>nd</sup> Floor
2-6	Baseboard Adhesive	2 <sup>nd</sup> Floor
2-7	Baseboard Adhesive	3 <sup>rd</sup> Floor
*2-8	Baseboard Adhesive	3 <sup>rd</sup> Floor
3-1	2' x 4' Wavy Pattern Ceiling Panels	Basement
3-2	2' x 4' Wavy Pattern Ceiling Panels	1 <sup>st</sup> Floor
3-3	2' x 4' Wavy Pattern Ceiling Panels	2 <sup>nd</sup> Floor
4-1	2' x 4' Replacement Ceiling Panels	Basement
4-2	2' x 4' Replacement Ceiling Panels	1 <sup>st</sup> Floor
4-3	2' x 4' Replacement Ceiling Panels	2 <sup>nd</sup> Floor
5-1	Carpet Adhesive	Basement



5-2		Carpet Adhesive	Basement
5-3		Carpet Adhesive	1 <sup>st</sup> Floor
5-4'		Carpet Adhesive	1 <sup>st</sup> Floor
5-5		Carpet Adhesive	2 <sup>nd</sup> Floor
5-6		Carpet Adhesive	2 <sup>nd</sup> Floor
5-7		Carpet Adhesive	3 <sup>rd</sup> Floor
*5-8		Carpet Adhesive	3 <sup>rd</sup> Floor
6-1		Dark Gray Mastic on Metal Duct	Basement
6-2		Dark Gray Mastic on Metal Duct	Basement
*6-3		Dark Gray Mastic on Metal Duct	Basement
7-1		Light Gray Mastic on Metal Duct	Basement
7-2		Light Gray Mastic on Metal Duct	1 <sup>st</sup> Floor
*7-3		Light Gray Mastic on Metal Duct	2 <sup>nd</sup> Floor
8-1	12" x 12" Beige w/White/Gray Floor Tile & Mastic		Basement
8-2	12" x 12" Beige w/White/Gray Floor Tile & Mastic		1 <sup>st</sup> Floor
*8-3	12" x 12" Beige w/White/Gray Floor Tile & Mastic		2 <sup>nd</sup> Floor
9-1		Stair Tread Adhesive	Basement
9-2		Stair Tread Adhesive	1 <sup>st</sup> Floor
*9-3		Stair Tread Adhesive	2 <sup>nd</sup> Floor
10-1		Plaster (Both Coats)	Basement
10-2		Plaster (Both Coats)	1 <sup>st</sup> Floor
10-3		Plaster (Both Coats)	1 <sup>st</sup> Floor
10-4		Plaster (Both Coats)	2 <sup>nd</sup> Floor
10-4A		Plaster (Both Coats)	2 <sup>nd</sup> Floor
10-5		Plaster (Both Coats)	3 <sup>rd</sup> Floor
10-5A		Plaster (Both Coats)	3 <sup>rd</sup> Floor
11-1		Tan Mastic on Metal Duct	Basement
11-2		Tan Mastic on Metal Duct	1 <sup>st</sup> Floor
*11-3		Tan Mastic on Metal Duct	Basement
12-1		2' x 4' Gypsum Ceiling Panels	Basement
12-2		2' x 4' Gypsum Ceiling Panels	1 <sup>st</sup> Floor
12-3		2' x 4' Gypsum Ceiling Panels	2 <sup>nd</sup> Floor
13-1		Drywall/Joint Compound	1 <sup>st</sup> Floor
13-2		Drywall/Joint Compound	1 <sup>st</sup> Floor
13-3		Drywall/Joint Compound	1 <sup>st</sup> Floor
13-4		Drywall/Joint Compound	1 <sup>st</sup> Floor
13-5		Drywall/Joint Compound	1 <sup>st</sup> Floor
13-6		Drywall/Joint Compound	1 <sup>st</sup> Floor
13-7		Drywall/Joint Compound	1 <sup>st</sup> Floor
14-1		Red Fire Stop Caulking	1 <sup>st</sup> Floor
14-2		Red Fire Stop Caulking	1 <sup>st</sup> Floor
*14-3		Red Fire Stop Caulking	1 <sup>st</sup> Floor

4890

1<sup>st</sup> Floor

41890

15-1	Fire Resistant Board	Basement
15-2	Fire Resistant Board	Basement
15-3	Fire Resistant Board	Basement
16-1	Black Sink Undercoating	1 <sup>st</sup> Floor
16-2	Black Sink Undercoating	1 <sup>st</sup> Floor
*16-3	Black Sink Undercoating	1 <sup>st</sup> Floor
17-1	Brown Fire Stop Caulking	1 <sup>st</sup> Floor
17-2	Brown Fire Stop Caulking	2 <sup>nd</sup> Floor
*17-3	Brown Fire Stop Caulking	3 <sup>rd</sup> Floor
18-1	Drywall/Joint Compound	2 <sup>nd</sup> Floor
18-2	Drywall/Joint Compound	2 <sup>nd</sup> Floor
18-3	Drywall/Joint Compound	2 <sup>nd</sup> Floor
18-4	Drywall/Joint Compound	2 <sup>nd</sup> Floor
18-5	Drywall/Joint Compound	2 <sup>nd</sup> Floor
18-6	Drywall/Joint Compound	2 <sup>nd</sup> Floor
18-7	Drywall/Joint Compound	2 <sup>nd</sup> Floor
19-1	Green Board/Joint Compound	Basement
19-2	Green Board/Joint Compound	1 <sup>st</sup> Floor
19-3	Green Board/Joint Compound	2 <sup>nd</sup> Floor
19-4	Green Board/Joint Compound	3 <sup>rd</sup> Floor
19-5	Green Board/Joint Compound	3 <sup>rd</sup> Floor
20-1	Drywall/Joint Compound	3 <sup>rd</sup> Floor
20-2	Drywall/Joint Compound	3 <sup>rd</sup> Floor
20-3	Drywall/Joint Compound	3 <sup>rd</sup> Floor
20-4	Drywall/Joint Compound	3 <sup>rd</sup> Floor
20-5	Drywall/Joint Compound	3 <sup>rd</sup> Floor
20-6	Drywall/Joint Compound	3 <sup>rd</sup> Floor
20-7	Drywall/Joint Compound	3 <sup>rd</sup> Floor
21-1	Fire Rated Drywall/Joint Compound (Ceiling)	3 <sup>rd</sup> Floor
21-2	Fire Rated Drywall/Joint Compound (Ceiling)	3 <sup>rd</sup> Floor
21-3	Fire Rated Drywall/Joint Compound (Ceiling)	3 <sup>rd</sup> Floor
21-4	Fire Rated Drywall/Joint Compound (Ceiling)	3 <sup>rd</sup> Floor
21-5	Fire Rated Drywall/Joint Compound (Ceiling)	3 <sup>rd</sup> Floor
21-6	Fire Rated Drywall/Joint Compound (Ceiling)	3 <sup>rd</sup> Floor
21-7	Fire Rated Drywall/Joint Compound (Ceiling)	3 <sup>rd</sup> Floor
22-1	Bathroom Wall Tile Adhesive	Basement
22-2	Bathroom Wall Tile Adhesive	1 <sup>st</sup> Floor
*22-3	Bathroom Wall Tile Adhesive	3 <sup>rd</sup> Floor
23-1	White Caulking (Men's Bathroom)	Basement
23-2	White Caulking (Men's Bathroom)	1 <sup>st</sup> Floor
*23-3	White Caulking (Men's Bathroom)	3 <sup>rd</sup> Floor



[illegible]

**EMSL Analytical, Inc.**

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

<http://www.EMSL.com>[greensborolab@emsl.com](mailto:greensborolab@emsl.com)

EMSL Order: 021400515

CustomerID: UNSC62

CustomerPO:

ProjectID:

Attn: **Darryl Washington**  
**University of South Carolina**  
**743 Greene Street**  
**Columbia, SC 29208**

Phone: (803) 777-7000  
Fax: (803) 777-3990  
Received: 01/29/14 2:00 PM  
Analysis Date: 1/30/2014  
Collected:

Project: 1600 Hampton St. Annex

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
1 021400515-0001	Mastic Under Carpet	Tan/Black Non-Fibrous Homogeneous	1% Cellulose	96% Non-fibrous (other)	3% Chrysotile
2 021400515-0002	Mastic Under Carpet	Brown/Tan Non-Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (other)	None Detected
3 021400515-0003	Mastic Under Carpet	Tan/Black Non-Fibrous Homogeneous	1% Cellulose	96% Non-fibrous (other)	3% Chrysotile
4 021400515-0004	Mastic Under Carpet	Brown/Tan/Black Non-Fibrous Homogeneous	1% Synthetic 2% Cellulose	97% Non-fibrous (other)	None Detected

Analyst(s)

Kristie Elliott (1)

Nicole Shutts (3)

Stephen Bennett, Laboratory Manager  
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. Kernersville, NC NVLAP Lab Code 102104-0, CA ELAP 2689, Virginia 3333-000228, West Virginia LT000321

Initial report from 01/30/2014 11:05:34



**EMSL ANALYTICAL, INC.**  
LABORATORY • PRODUCTS • TRAINING

## Asbestos Bulk Building Material Chain of Custody

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

EMSL Analytical, Inc.  
706 Gralin Street

Kernersville, NC 27284

PHONE: (336) 992-1025

FAX: (336) 992-4175

FAX: (336) 992-4175

Company : University of South Carolina

Street: 743 Greene Street

City: Columbia

State/Province: SC

Report To (Name): Darryl Washington II

Email Address: washindh@fmc.sc.edu

Project Name/Number: 1600 Hampton St. AMK-

U.S. State Samples Taken: SC FM00430401

EMSL-Bill to: ☒ Same ☐ Different

If Bill to is Different note instructions in Comments\*\*

Third Party Billing requires written authorization from third party

Zip/Postal Code: 29208

Country: United States

Telephone #: 803-917-0291

Fax #:

Purchase Order:

Please Provide Results: ☐ Fax ☒ Email ☐ Mail

CT Samples: ☐ Commercial/Taxable ☐ Residential/Tax Exempt

**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.

**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%)

☐ NIOSH 9002 (<1%)

☐ NY ELAP Method 198.1 (friable in NY)

☐ NY ELAP Method 198.6 NOB (non-friable-NY)

☐ OSHA ID-191 Modified

☐ Standard Addition Method

**TEM - Bulk**

☒ TEM EPA NOB - EPA 600/R-93/116 Section 2.5.5.1

☐ NY ELAP Method 198.4 (TEM)

☐ Chatfield Protocol (semi-quantitative)

☐ TEM % by Mass - EPA 600/R-93/116 Section 2.5.5.2

☐ TEM Qualitative via Filtration Prep Technique

☐ TEM Qualitative via Drop Mount Prep Technique

**Other**

☐

☐ Check For Positive Stop - Clearly Identify Homogenous Group

Date Sampled:

Samplers Name:

Samplers Signature:

Sample #

HA #

Sample Location

Material Description

TEM if neg.

Client Sample # (s):

Total # of Samples: 4

Relinquished (Client):

Date:

Time:

Received (Lab):

Date:

Time:

Comments/Special Instructions:

NS  
FL 7958 8078 9109



Reset Form

Print Form



Building # 029A - 1600 HAMPTON ST ANNEX

## Sample Analysis

Type of Analysis: Lead / Asbestos Date:

1/27/14

Turn Around Time 24 HOUR

Area	Sample ID	Material Sampled	Material Location	F/NF	Cond	Quantity	Pot to Disturb
A	1	BLACK MASTIC UNDER CARPET	IN MIDDLE OF SUITE 013	NF	GOOD	>5000 SQ FT	LOW
A	2	BLACK MASTIC UNDER CARPET	3RD FLOOR BY DOOR TO WEST STAIRWELL	NF	GOOD	>5000 SQ FT	LOW
A	3	BLACK MASTIC UNDER CARPET	3RD FLOOR AT ENTRY TO ELEC. CLOSET #302	NF	GOOD	>5000 SQ FT	LOW
A	4	BLACK MASTIC UNDER CARPET	3RD FLOOR HALLWAY - MIDWAY AT CARPET PATCH	NF	GOOD	>5000 SQ FT	LOW

License # BI-01296

FM# FM00430401

Signature E. Mulare

Requestor CHRIS MERGNER

Send lab results in PDF and CSV format as soon as possible to: asbestos@mailbox.sc.edu

## **APPENDIX C**

### Personnel Certifications

# SCDHEC ISSUED Asbestos ID Card

Glynn M Ellen

Expires



CONSULTMP	ASB-22641 02/15/14
AIR SAMPLER	AS-00079 02/25/14
SUPERHERA	SA-00455 02/25/14
CONSULTPD	PD-00098 06/13/14

**SCDHEC ISSUED**  
**Asbestos ID Card**

Michael Mincey

Expires



CONSULTMP

MP-00161 02/15/14

## **APPENDIX D**

SCDHEC Regulation Summary  
SCDHEC Abatement Project Forms

## **Air Quality**

### **Asbestos - Regulatory Information**

#### **RENOVATIONS & DEMOLITIONS**

Note: This information should serve as a guide only and is not intended to replace the regulations. For additional information concerning DHEC and EPA regulations, contact DHEC's Asbestos Section at (803) 898-4289. Information regarding the OSHA asbestos standards may be obtained from the South Carolina Department of Labor, Licensing and Regulation at (803) 734-9669.

#### **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 unless the property was used in the past for non-residential purposes (contact the Asbestos Section for additional information) or is part of a larger development such as highway right-of-way, mall development, urban renewal or other type of similar development. The facility owner and the renovation or demolition contractor are both responsible for ensuring compliance with these regulations.

#### **DEFINITIONS**

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

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

#### **INSPECTION FOR ASBESTOS**

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 materials, either friable or non-friable, on interior and exterior portions of the facility. The inspector must also comply with the procedures specified in 40 CFR 763.86 in determining sampling locations and the number of representative samples to be collected. 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 40 CFR 763.85 (a)(4)(vi)(A)-(E), as well as the date of inspection and the name, license number, and signature of the licensed Asbestos Building Inspector or Management Planner who performed the inspection and completed the report. 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 the Department as an Asbestos Project Designer.

### **NON-FRIABLE ASBESTOS-CONTAINING MATERIALS**

During renovations, removal of non-friable materials (e.g., vinyl-asbestos floor tiles and sheet flooring, mastics, asphaltic roofing, and asbestos-cement siding and roofing tiles) may be regulated. Applicability is dependent upon the removal methods to be used. If it can be anticipated that non-friable materials will be ground, crumbled, sanded, abraded, chipped or pulverized, the removal is subject to the same rules as removal of friable materials.

Prior to any demolition, non-friable asbestos-cement products (e.g., transite siding, exterior siding and roofing shingles) must be removed. Asbestos-containing sheet flooring and floor tiles, as well as asphaltic roofing products, need not be removed if they are in good condition and have not become brittle and are not peeling, cracking, or crumbling. Otherwise, they must also be removed prior to demolition. If it can be anticipated that non-friable materials will be ground, crumbled, sanded, abraded, chipped or pulverized, the materials must be removed and the removal is subject to the same rules as removal of friable materials. The amount of any non-friable asbestos that will remain in place during demolition must also be indicated on the written notification form.

***All asbestos-containing materials must be removed if the facility will be demolished by non-standard demolition techniques such as implosion, explosion, or intentional burning.***

## NOTIFICATION FOR RENOVATIONS AND DEMOLITIONS

Prior to removing regulated asbestos-containing materials, written notification must be submitted to the Department (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 the Department *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.

## REGULATORY REQUIREMENTS FOR BUILDING INSPECTION

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

Under SCDHEC 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.

SCDHEC 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 Department 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, SCDHEC 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, SCDHEC 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. SCDHEC 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 SCDHEC Regulation 61-86.1, surfacing materials on exterior and interior portions of a facility shall be sampled according to procedures outlined in SCDHEC 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, caulking, ceiling tiles, fire doors, wall boards, and flexible duct connections. To remain in compliance with SCDHEC 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 SCDHEC 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 materials (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.

**SCDHEC 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 Department issued asbestos building inspector or management planner license



## 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)
		<input type="checkbox"/> FRIABLE <input type="checkbox"/> NON-FRIABLE
		<input type="checkbox"/> FRIABLE <input type="checkbox"/> NON-FRIABLE
		<input type="checkbox"/> FRIABLE <input type="checkbox"/> NON-FRIABLE
		<input type="checkbox"/> FRIABLE <input type="checkbox"/> 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)



## 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 &amp; 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>



## 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 (     )
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3. Abatement Contractor Name & Address:	Abatement Contractor Telephone Number (     )
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4. Name of waste disposal site (WDS), mailing address, and physical site location:	WDS Telephone Number: (     )
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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)
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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:
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11. Name, title, address, telephone number:	Signature:	Date:
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#### Disposal Site Operator

12. Discrepancy:	<u>Bags or Containers</u>	<u>Total Quantity</u>
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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.