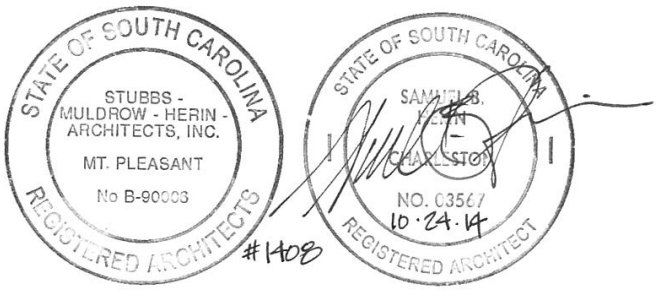
UNIVERSITY OF SOUTH CAROLINA

## Project Manual

# Contract Documents
# Historic Horseshoe Wall Restoration
# Phase 1

State Project No. H27-Z138
IDC Work Order CP00391318/FM0044949
SMHa Project Number 1408
October 24th, 201




SMHa
Stubbs Muldrow Herin architects, inc.
400 Hibben Street • Mount Pleasant SC • 29464

Structural Consultant
ADC Engineering
7825 Broad River Road, Suite 300, Irmo, SC 29063

Historic Materials Analysis (under separate contract to USC)
Dr. Dennis Brosnan, PhD, PE
Clemson, SC

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**PROJECT NUMBER:** H27-Z138

**PROJECT NAME:** USC Historic Horseshoe Wall Restoration – Phase 1

**SECTION**

## TECHNICAL SPECIFICATIONS

*(List the technical specifications using the same Divisions numbers and titles as shown on the individual technical specification sections. Provide the issue date and revision number for each section.)*

2011 Edition
Rev. 7/20/2011

# SE-310
# REQUEST FOR ADVERTISEMENT

**PROJECT NAME:** USC Historic Horseshoe Wall Restoration- Phase 1

**PROJECT NUMBER:** H27-Z138

**PROJECT LOCATION:** 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:** $250,000 -$400,000

**DESCRIPTION OF PROJECT:** Historic restoration of designated portions of the masonry wall surrounding USC's historic Horseshoe. Work shall include removal and replacement (tuckpoiniting) of all mortar on the exterior and interior faces of the wall, replacement of damaged brick, and removal and replacement of damaged portions of the wall. Small and minority business participation is encouraged. Bidders are responsible for obtaining all information including all updates from USC's website: www.purchasing.sc.edu. See Facilities/Construction Solicitations and Awards.

**A/E NAME:** Stubbs Muldrow Herin architects, inc.

**A/E CONTACT:** Gordon Nicholson, AIA

**A/E ADDRESS:** Street/PO Box: 400 Hibben Street
City: Mount Pleasant
State: SC ZIP: 29464-___

**EMAIL:** g.nicholson@smha.com

**TELEPHONE:** 843-881-7642 **FAX:** 843-884-5021

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

**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)*:

N/A

_____

_____

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

**DATE:** 11/17/2014 **TIME:** 2 pm **PLACE:** USC Facilities Management Center, Conference Room 53, 743 Greene Street, Columbia, SC 29208

**AGENCY:** University of South Carolina

**NAME OF AGENCY PROCUREMENT OFFICER:** Michelle Adams

**ADDRESS:** Street/PO Box: 743 Greene Street
City: Columbia
State: SC ZIP: 29208-___

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

**TELEPHONE:** 803-777-0981 **FAX:** (803) 777-7334

**BID CLOSING DATE:** 12/4/2014 **TIME:** 2 pm **LOCATION:** USC Facilities Management Ctr., Conference Room 53, 743 Greene Street, Columbia, SC 29208

**BID DELIVERY ADDRESSES:**

**HAND-DELIVERY:**

Attn: Michelle Adams

USC Facilities Management Center

743 Greene Street

Columbia, SC 29208

**MAIL SERVICE:**

Attn: _____

USC Facilities Management Center

743 Greene Street

Columbia, SC 29208

# SE-310
# REQUEST FOR ADVERTISEMENT

2011 Edition
Rev. 7/20/2011

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

**APPROVED BY** *(Office of State Engineer)*: _____ **DATE:** _____

SECTION AIA A201-1997 - GENERAL CONDITIONS OF THE CONTRACT

1.1 GENERAL

A. The General Conditions of the Contract for Construction, AlA Document A201-1997 Edition, shall be the form of General Conditions and is incorporated into the Contract Documents by reference herein.

B. Copies of General Conditions of the Contract for Construction, AlA Document A201-1997 Edition, may be obtained from the American Institute of Architects, 1735 New York Avenue, N.W., Washington DC 20006, or from local AlA offices and reprographic offices.

A. Original AlA Document on file at the Office of the University of South Carolina Construction Services, 743 Greene Street, Columbia, SC 29208.

END OF SECTION AIA A201-1997

SECTION AIA A701-1997 - INSTRUCTIONS TO BIDDERS

1.1 GENERAL

A. Instruction to Bidders, AlA Document A701-1997 Edition, is incorporated into the Contract Documents by reference herein.

B. Copies of Instructions to Bidders, AlA Document A701-1997, may be obtained from the American Institute of Architects, 1735 New York Avenue, N.W., Washington DC 20006, or from local AlA offices and reprographic offices.

C. Original AlA Document on file at the Office of the University of South Carolina Construction Services, 743 Greene Street, Columbia, SC 29208.

END OF SECTION AIA A701-1997

# OSE FORM 00201

Revised October 22, 2012

# STANDARD SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

**OWNER:** University of South Carolina
**PROJECT NUMBER:** H27-Z138
**PROJECT NAME:** Historic Horseshoe Wall Restoration – Phase 1
**PROJECT LOCATION:** Columbia, SC

**PROCUREMENT OFFICER:** Michelle Adams

## 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.

**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

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

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.

**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

**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.

**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.

**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."*

**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

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

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:** Reception Area
**Building Where Posted:** Facilities Planning and Construction
**Address of Building:** 743 Greene Street, Columbia, SC 29208
**WEB site address (if applicable):** http://purchasing.sc.edu (see "Facilities/Construction Solicitation /Awards").
**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,
(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.

**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**

A. The documents in "PDF" format will be posted at http://purchasing.sc.edu under Facilities/Construction Solicitations & Awards. All addenda will also be posted on this website. Digital copies of the documents on websites other than this are not ligitimate and not authorized. Bidders using alternate websites to access drawings accept full responsibility for any differences. Hardcopies of documents will not be distributed. All bidders are advised that review of partial sets of documents is not recommended and bidders will be responsible for any descrepancies which might have been avoided had a full set of documents been reviewed.

B. Two (2) sets of hardcopies will be provided to the successful bidder.

C. QUALIFICATIONS SUBMITTALS - Firm qualification submittals as defined in in Section 013591 for historic treatments under the following Sections shall be submitted within 48 hours of reciept of bids and shall be verified prior to award of bid:

(a) 013591 - Historic Treatment Procedures,
(b) 040129 - Maintenance of Unit Masonry

**END OF DOCUMENT**

SECTION AIA A310-2010 - BID BOND

1.1 GENERAL

A. Bid Bond, AlA Document A310-2010 Edition, is incorporated into the Contract Documents by reference herein.

B. Copies of Bid Bond, AlA Document A310-2010 Edition, may be obtained from the American Institute of Architects, 1735 New York Avenue, N.W., Washington DC 20006, or from local AlA offices and reprographic offices.

A. Original AlA Document on file at the Office of the University of South Carolina Construction Services, 743 Greene Street, Columbia, SC 29208.

END OF SECTION AIA A310-2010

# SE-330 – LUMP SUM BID
# BID FORM

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:** HISTORIC HORSESHOE WALL RESTORATION - PHASE 1

**PROJECT NUMBER:** H27-Z138

**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)*****:** Historic restoration of designated portions of the masonry wall surrounding USC's historic Horseshoe. Work shall include removal and replacement (tuckpointing) off all mortar on the exterior and interior faces of the wall, replacement of damaged brick, and removal and replacement of damaged portions of the wall.

_____, which sum is hereafter called the Base Bid.

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

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

**ALTERNATE # 1** *(Brief Description)*:Remove from the scope of the Work repointing a portion of the east side of wall (the portion indicated on the drawings) of Segment No. 4 and No. 5; if demolition of the Greenhouse by the Owner is not complete.

☐ **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)*: Demolish existing low brick raised planter, iron fence, plant materials, and soils as indicated. Remove concrete pavement at triangle infill area back to edge of sidewalk. Remove brick wall coping and 6 courses of existing wall. Rebuild coping to match existing at lower level. Clean and restore brickwork at base of wall. Provide approximately 120 sf new brick pavement in triangle area. Brick pavement to be dry laid on granite screening bed over 4" compacted aggregate with metal edge restraint on exposed angled edge. Coordinate with owner for the sequencing of all work. Return existing signage to owner.

☐ **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)*: _____

☐ **ADD TO** or ☐ **DEDUCT FROM BASE BID:**_____

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

**§ 6.3 UNIT PRICE WORK**

Bidder offers for the Agency's consideration and use the following **UNIT PRICES.** The **UNIT PRICES** offered by Bidder indicate the amount to be added to or deducted from the Contract Sum for each item-unit combination. **UNIT PRICES** include all costs to the Agency, including those for materials, labor, equipment, tools of trades and labor, fees, taxes, insurance, bonding, overhead, profit, etc. The Agency reserves the right to include or not to include any of the following **UNIT PRICES** in the Contract and to negotiate the **UNIT PRICES** with Bidder**.**

| NO. | ITEM | UNIT OF MEASURE | ADD | DEDUCT |
|---|---|---|---|---|
| **1.** | Deduct 10 square feet of above grade mortar on wall area including excavation and backfill. | square feet | | |
| **2.** | Add Ten square feet below grade mortar repointing, including excavation and backfill. | square feet | | |
| **3.** | Removal of one cubic yard of unsuitable soil adjacent to and under wall including three linear | | | |

# SE-330 – LUMP SUM BID
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| | | |
|---|---|---|
| | feet of temporary shoring. | cubic yard |
| **4.** | Add one cubic yard of flowable fill replace unsuitable soil under wall. | cubic yard |
| **5.** | Add one cubic yard of suitable growing mixture of sand and organic fill material above flowable fill (in Unit Price 4) to finish grade. | cubic yard |
| **6.** | | |

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# BID FORM

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**§ 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:

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

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.

**SE-330 – LUMP SUM BID**
**BID FORM**

# 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 **90** 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 $**200.00**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

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**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:** _____

**ADRESS:**_____

_____

**BY:**_____ **DATE:**_____

*(Signature)*

**TITLE:**_____

**TELEPHONE:**_____

**EMAIL:** _____

SECTION AIA A101-1997 - STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

1.1 GENERAL

A. The Standard Form of Agreement between Owner and Contractor, AlA Document A101-1997 Edition, shall be the form of agreement and is incorporated into the Contract Documents by reference herein.

B. Copies of Standard Form of Agreement between Owner and Contractor, AlA Document A101-1997, may be obtained from the American Institute of Architects, 1735 New York Avenue, N.W., Washington DC 20006, or from local AlA offices and reprographic offices.

A. Original AlA Document on file at the Office of the University of South Carolina Construction Services, 743 Greene Street, Columbia, SC 29208.

END OF SECTION AIA A101-1997

# OSE FORM 00501

Rev. 12/02/2013

# STANDARD MODIFICATIONS TO AGREEMENT BETWEEN OWNER AND CONTRACTOR

**OWNER:** University of South Carolina
**PROJECT NUMBER:** H27-Z138
**PROJECT NAME:** Historic Horseshoe Wall Restoration – Phase 1

**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%)."*

**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:** Senior 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:** Emily Jones
**Title:** Landscape Architect/Project Manager
**Address:** 743 Greene Street, Columbia, SC 29208
**Telephone:** 803-777-7592 **FAX:** 803-777-0484
**Email:** EFJONES@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:** _____

**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:** Gordon Nicholson, AIA
**Title:** Architect, Stubbs Muldrow Herin architects, inc.
**Address:** 400 Hibben Street, Mount Pleasant, SC 29464
**Telephone:** 843-881-7642 **FAX:** 843-884-5021
**Email:** g.nicholson@smha.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**

# OSE FORM 00811
Rev. 07/14/2014

# STANDARD SUPPLEMENTARY CONDITIONS

**OWNER:** University of South Carolina
**PROJECT NUMBER:** H27-Z138
**PROJECT NAME:** Historic Horseshoe Wall Restoration - Phase 1

## 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.

**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.

**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

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 Contactor 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 before the opening words "The Contractors shall."*

**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.

**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 is 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

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;

**.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:

**.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.

**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.

**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,* d*elete 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

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.

**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."*

**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) ..... $1,000,000
- **(b)** Products/Completed Operations ..... $1,000,000
- **(c)** Personal and Advertising Injury ..... $1,000,000
- **(d)** Each Occurrence ..... $1,000,000
- **(e)** Fire Damage (Any one fire) ..... $50,000
- **(f)** Medical Expense (Any one person) ..... $5,000

**(2)** BUSINESS AUTO LIABILITY (including All Owned, Non-owned, and Hired Vehicles):
- **(a)** Combined Single Limit ..... $1,000,000

**(3)** WORKER'S COMPENSATION:
- **(a)** State Statutory
- **(b)** Employers Liability ..... $100,000 Per Acc.
  ..... $500,000 Disease, Policy Limit
  ..... $100,000 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

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.

**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 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.

**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 to 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.

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 Caroline 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.

**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)

**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

**.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;

**.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.

**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 waive 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.

**15.1.6.3** 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) attorney's fees, (vi) any interest; (vii) unamortized equipment costs; and, (viii) losses incurred by subcontractors for the types of damages the Contractor has waive 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.

**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: All inspections provided by the Owner

**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)*

_____

**16.3.** Requirements for Record Drawings, if any. *(Refer to attachments as needed.* If *none, enter NONE)*
Refer to Section 017700 "Closeout Procedures"

**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)*
Refer to Section 013300 "Submittal Prodedures".

**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)*
Refer to Section 015000 "Temporary Facilities and Controls".

**16.6.** Requirements for Project Cleanup in addition to the Contract, if any. *(Refer to attachments as needed. If none, enter NONE)*
Refer to Section 017700 "Closeout Procedures".

**16.7.** List all attachments that modify these General Conditions. *(If none, enter NONE)*
USC Supplemental General Conditions for Construction Projects.

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 available.

2. Fraternization 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 material 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, Contractor name and contact number, and end date. Where this area is subject to foot traffic, protective barriers will be provided as specified by the 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 _____ 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 JOB SITES REGULARLY AND WILL FINE ANY CONTRACTOR FOUND TO BE IN VIOLATION OF THIS REQUIREMENT AN AMOUNT OF UP TO $1,000 PER VIOLATION.

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

15. 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.

16. 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.

17. For projects requiring heavy loads to cross walks tree root zones or lawns. A construction entry road consisting of 10' X 16' oak logging mates on 12" coarse, chipped, hardwood base. Mulch and logging mats shall be supplemented throughout the project to keep matting structurally functional.

18. Any damage to existing landscaping (including lawn areas) will be remediated before final payment is made.

19. Orange safety fence to be provided by the contractor. (USC Arborist, Kevin Curtis may be contacted at 777-0033 or 315-0319)

**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 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.

Project Name: USC Historic Horseshoe Wall Restoration – Phase 1

Project Number: H27-Z138

University of South Carolina

## CONTRACTOR'S ONE YEAR GUARANTEE

STATE OF _____

COUNTY OF _____

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

Defects or failures resulting from abuse by Owner.

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

_____
[Name of Contracting Firm]

*By_____

Title_____

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

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

_____State

My commission expires _____

# SE-480
# CONSTRUCTION CHANGE ORDER

2011 Edition

**Change Order No.:**

**Agency:** **University of South Carolina**
**Project Number:** H27-Z138
**Project Name:** Historic Horseshoe Wall Restoration - Phase 1

**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:** _____

# SE-355 2011 Edition
# Performance Bond 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: USC Historic Horseshoe Wall Restoration – Phase 1
State Project Number: H27-Z138
Brief Description of Awarded Work, as found on the SE-330, Bid Form: All scope outlined on drawings and described in technical specifications for USC Historic Horseshoe Wall Restoration.

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

Name: Stubbs Muldrow Herin architects, inc.
Address: 400 Hibben Street
Mount Pleasant, SC 29464

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

**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
Rev. 10/29/12

## 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: Historic Horseshoe Wall Restoration-Ph 1
Project Number: H27-Z138
Brief Description of Awarded Work, as found on the SE-330, Bid Form: All scope outlined on drawings and described in technical specifications for USC Historic Horseshoe Wall Restoration.

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

Name: Stubbs Muldrow Herin architects, inc
Address: 400 Hibben Street
Mount Pleasant, SC 29464

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

Rev. 10/29/12

# 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 o ne 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.

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
1. Work covered by the Contract Documents.
2. Owner's Consultants.
3. Type of the Contract.
4. Qualifications.
5. Permits and Cost of Permits.
6. Work under other contracts.
7. Use of premises
8. Owner's occupancy requirements.
9. Owner furnished products.
10. Specification formats and conventions.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Description: Historic restoration of designated portions of the masonry wall surrounding USC's historic Horseshoe. Work shall include removal and replacement (tuckpoiniting) of all mortar on the exterior and interior faces of the wall, replacement of damaged brick, and removal and replacement of damaged portions of the wall.

1.4 OWNER'S CONSULTANTS

A. The Owner has retained two consultants under separate contracts for the design of this project:
1. Architect: Stubbs Muldrow Herin architects, inc., Mount Pleasant, SC
2. Historic Materials Analysis: Dr. Dennis Brosnan, Clemson, SC.

1.5 TYPE OF CONTRACT

A. Project will be constructed under a single prime contract.

1.6 PERMITS

A. Authorities having jurisdiction include:

1. Office of the State Engineer (Review was not required, permit not required).

2. The State Department of Archives and History. (Documents have been submitted for review by this agency, permit not required).
3. City of Columbia. (Contractor shall comply with applicable ordinances for working in the city).

## 1.7 WORK UNDER OTHER CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

B. Concurrent Work: Owner will conduct separate Work for the following construction operations at Project Site. These operations are scheduled to be completed prior to the Work described in these Documents. However, subsequent coordination may be required between the Contractor and USC's Facilities Management Office during the course of the Work.
1. Tree Removal.
2. Tree Protection.
3. Sitework and Construction on projects adjacent to the Work as indicated.

## 1.8 USE OF PREMISES

A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.
1. Contractor shall coordinate access to the site with the Architect and Owner’s representatives.
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.

## 1.9 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 50-division format and CSI/CSC's "MasterFormat" numbering system.
1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
2. Division 01: Sections in Division 01 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 011000

SECTION 012200 - UNIT PRICES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

B. Related Requirements:

1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
2. Division 01 Section "Quality Requirements" for general testing and inspecting requirements.

### 1.3 DEFINITIONS

A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

### 1.4 PROCEDURES

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

B. Measurement and Payment: It is anticipated the scheduled work items and amounts may be required on this project. These items and amounts are not included in the Technical Specifications and Drawings documents; they are in addition to work indicated in the documents. These work items shall conform to referenced standards in the Technical Specifications. If the required quantities of the items listed below are increased or decreased by Change Order, the adjustment unit prices set forth below shall apply to such increased or decreased quantities.

C. Indicate unit prices on Bid Form.

D. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

E. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Unit Price No. 1:

1. Description: Deduct 10 square feet of above grade mortar repointing on wall area including piers and cap. This unit price shall be the basis for calculating Work removed from Contract in the event of an access conflict caused by adjacent work under a separate agreement; or in the event sound mortar is encountered that does not require repointing. Cost basis: square foot of surface area.

2. Unit of Measurement: Ten Square Feet.

B. Unit Price No. 2:

1. Description: Add 10 square feet of below grade mortar repointing, including excavation and backfill. Cost basis: square foot of surface area.

2. Unit of Measurement: Ten Square Feet.

C. Unit Price No. 3:

1. Description: Removal of one cubic yard of unsuitable soil adjacent to and under wall including 3 linear feet of temporary shoring.

2. Unit of Measurement: Cubic Yard.

D. Unit Price No. 4.

1. Description: Add one cubic yard of flowable fill to replace unsuitable soil under wall.

2. Unit of Measurement: Cubic Yard.

E. Unit Price No. 5.

1. Description: Add one cubic yard of suitable growing mixture of sand and organic fill material above flowable fill (in Unit Price 4) to finish grade.

2. Unit of Measurement: Cubic Yard.

END OF SECTION 012200

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: Repointing East Wall Segment No. 4 and No. 5

1. Base Bid: Repoint east wall Segment No. 4 and No. 5 as indicated.

2. Alternate: Remove from the scope of the Work repointing a portion of the east side of wall (the portion indicated on the drawings) of Segment No. 4 and No. 5; if demolition of the Greenhouse by the Owner is not complete.

B. Alternate No. 2:

1. Base Bid: Demolish and Rebuild corner wall at Segment 11.

2. Alternate: Demolish existing low brick raised planter, iron fence, plant materials, and soils as indicated. Remove concrete pavement at triangle infill area back to edge of sidewalk. Remove brick wall coping and 6 courses of existing wall. Rebuild coping to match existing at lower level. Clean and restore brickwork at base of wall. Provide approximately 120 sf new brick pavement in triangle area. Brick pavement to be dry laid on granite screening bed over 4" compacted aggregate with metal edge restraint on exposed angled edge. Coordinate with owner for the sequencing of all work. Return existing signage to owner.

END OF SECTION 012300

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

1.3 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 Architect's form.

1.4 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 14 days 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 01 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use Architect's form for Proposal Requests.

1.5 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".

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on Form SE-420, "Construction Change Directive". 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 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 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 the following:

a. Application for Payment forms with Continuation Sheets.
b. Submittals Schedule.

2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
3. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules 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. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

a. Related Specification Section or Division.
b. Description of the Work.
c. Name of subcontractor.

d. Name of manufacturer or fabricator.
e. Name of supplier.
f. Change Orders (numbers) that affect value.
g. Dollar value.

1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

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.

a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if required.

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.

## 1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect 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 Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect 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.

E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Architect 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.

F. 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, before 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. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

G. 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. Products list.
5. Schedule of unit prices.
6. Submittals Schedule (preliminary if not final).
7. List of Contractor's staff assignments.
8. List of Contractor's principal consultants.
9. Copies of building permits.
10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
11. Initial progress report.
12. Report of preconstruction conference.
13. Certificates of insurance and insurance policies.
14. Performance and payment bonds.
15. Waste management plan.
16. Data needed to acquire Owner's insurance.
17. Initial settlement survey and damage report if required.

H. Periodic Applications for Payment: Administrative actions and submittals that must precede or coincide with submittal of periodic Applications for Payment during the course of the project include the following:

1. RFI log.
2. Schedule updates.
3. Meeting minutes since last application for payment.
4. Waste management plan.

I. Application for Payment at Substantial Completion: After issuing the Certificate of Full or Partial Substantial Completion (Form SE-550A), 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.

J. Final Payment Application: After issuing the Certificate of Final Completion (Form SE-560C), 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 verifying that required contract insurance will remain in force after final payment and will not be canceled or expired until 30 days after written notice has been given by Agency. Provide certificate in form of AIA Document G715, “Supplemental Attachment for ACORD Certificate of Insurance”.
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.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Inspection reports.
10. Record documents.
11. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. Administrative and supervisory personnel.
2. Project meetings.
3. Requests for Interpretation (RFIs).

1.3 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction 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 Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.

7. Project closeout activities.
8. Startup and adjustment of systems.
9. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

## 1.4 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

## 1.5 PROJECT MEETINGS

A. General: 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, Architect and others as may be identified by the Owner of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: 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: Schedule 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. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items identified in Table 7.3-1, “Pre-Construction Conference” of the OSE Manual.
3. Minutes: Record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

    a. The Contract Documents.
    b. Options.
    c. Related requests for interpretations (RFIs).
    d. Related Change Orders.
    e. Purchases.
    f. Deliveries.
    g. Submittals.
    h. Review of mockups.

i. Possible conflicts.
j. Compatibility problems.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written recommendations.
n. Warranty requirements.
o. Compatibility of materials.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at biweekly intervals, unless otherwise indicated in Agreement. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner 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 conference 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.
b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Work hours.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.

13) Status of correction of deficient items.
14) Field observations.
15) Requests for interpretations (RFIs).
16) Status of proposal requests.
17) Pending changes.
18) Status of Change Orders.
19) Pending claims and disputes.
20) Documentation of information for payment requests.

3. Minutes: Record and distribute to attendees the meeting minutes.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

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.

E. Coordination Meetings: Conduct Project coordination meetings at biweekly intervals, concurrent with regular progress meetings. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: Include 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 conference shall be familiar with Project and authorized to conclude matters relating to the Work. Notify representatives of Owner and Architect 5 days prior to coordination meetings. Architect’s attendance is optional.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to Combined 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.
b. Schedule Updating: Revise Combined Contractor's Construction Schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
c. Review present and future needs of each contractor present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Work hours.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.
13) Change Orders.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.6 REQUESTS FOR INTERPRETATION (RFIs)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.

1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned 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 interpretation and the following:

1. Project name.
2. Date.
3. Name of Contractor.
4. Name of Architect.
5. RFI number, numbered sequentially.
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate.
9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
10. Contractor's signature.
11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

C. Hard-Copy RFIs: CSI Form 13.2A.

1. Identify each page of attachments with the RFI number and sequential page number.

D. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.

1. Attachments shall be electronic files in Adobe Acrobat PDF format.

E. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow one to five working days for Architect's response for each RFI. RFIs received 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 approval of submittals.
b. Requests for approval of substitutions.
c. Requests for coordination information already indicated in the Contract Documents.
d. Requests for adjustments in the Contract Time or the Contract Sum.
e. Requests for interpretation of Architect's actions on submittals.
f. Incomplete RFIs or RFIs with numerous errors.

2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
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.

F. 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.

G. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use CSI Log Form 13.2B.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

REQUEST FOR INFORMATION

| | | |
|---|---|---|
| CONTRACTOR: | | ARCHITECT: |
| ADDRESS: | | ADDRESS: |
| PHONE: | | PHONE: |
| PROJECT NAME: | | PROJECT LOCATION: |
| RFI NUMBER: | DATE OF REQUEST: | DATE RESPONSE REQUIRED (2 DAYS MIN.): |
| DESCRIPTION OF RFI: | | |
| AS-BUILT SKETCHES ENCLOSED: | SPECIFICATION PARAGRAPH REFERENCE: | DRAWING REFERENCE: |
| CONTRACTOR'S RECOMMENDATION: | | |
| COST IMPACT: | | SCHEDULE IMPACT: |
| SUBCONTRACTORS AFFECTED: | | |
| SUBCONTRACTORS COORDINATED WITH: | | |
| SUBMITTED BY: | | |
| ARCHITECT'S RESPONSE: | | |
| BY: | | |

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Submittals Schedule.
3. Daily construction reports.
4. Material location reports.
5. Field condition reports.
6. Special reports.
7. Scheduling consultant qualifications.

1.3 DEFINITIONS

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

1. Critical activities are activities on the critical path. They 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. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.

1. Float time belongs to Owner.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.

3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

H. Major Area: A story of construction, a separate building, or a similar significant construction element.

I. Milestone: A key or critical point in time for reference or measurement.

J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

## 1.4 SUBMITTALS

A. Contractor's Construction Schedule: Submit initial schedule, large enough to show entire schedule for entire construction period to Owner, Architect, and others identified by the Owner at the pre-construction meeting.

1. Submittal may be by electronic copy, and labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date in title block.

B. Field Condition Reports: Submit at time of discovery of differing conditions.

C. Special Reports: Submit at time of unusual event.

D. Revised Schedules: Submit each month that schedule is affected.

## 1.5 QUALITY ASSURANCE

A. Scheduler Qualifications: An experienced specialist in scheduling and reporting

B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including interim milestones and partial Owner occupancy.
4. Review delivery dates for Owner-furnished products.
5. Review schedule for work of Owner's separate contracts.
6. Review time required for review of submittals and resubmittals.
7. Review requirements for tests and inspections by independent testing and inspecting agencies.
8. Review time required for completion and startup procedures.
9. Review and finalize list of construction activities to be included in schedule.
10. Review submittal requirements and procedures.
11. Review procedures for updating schedule.

1.6 COORDINATION

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

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

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial 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.

C. Activities: Treat each trade, component, 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 20 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: Include time for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Work 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. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
6. Work Restrictions: Show the effect of the following items on the schedule:

    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Uninterruptible services.
    d. Partial occupancy before Substantial Completion.
    e. Use of premises restrictions.
    f. Provisions for future construction.
    g. Seasonal variations.
    h. Environmental control.

7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

    a. Subcontract awards.
    b. Submittals.
    c. Purchases.
    d. Mockups.
    e. Fabrication.
    f. Sample testing.
    g. Deliveries.
    h. Installation.
    i. Tests and inspections.
    j. Adjusting.
    k. Curing.
    l. Startup and placement into final use and operation.

8. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

    a. Structural completion.
    b. Permanent space enclosure.
    c. Completion of mechanical installation.
    d. Completion of electrical installation.
    e. Substantial Completion.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

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

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.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
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. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

C. 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 interpretation on CSI Form 13.2A. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION 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 Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect, 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 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.3 CAD DRAWINGS

A. General: Electronic copies of CAD Drawings of the Contract Drawings may be provided by the Architect for Contractor's use in preparing submittals for a nominal fee to cover the time expense with the following terms.

1. CADD files provided by Stubbs Muldrow Herin architects, inc. and/or architect's consultants may be used by the subcontractor only for pictorial use in the production of shop drawings for that project. Any title blocks, dimensions, text, or other information pertaining to the contract drawings will not appear on shop drawings except by special permission by the architect or engineer.
2. The CADD files and information contained therein will not be transmitted, transferred and otherwise disseminated to any other third party for any purpose.
3. Provision of CADD files by the Architect does not relieve the Contractor of obligations of the Contract Documents, including AIA A201, General Conditions of the Contract.
4. The Architect shall be reimbursed for administrative and handling costs at the rate of $45 per drawing file mailed or electronically transferred.
5. By using the architect's electronic file you acknowledge and agree as follows: Stubbs Muldrow Herin architects, inc. (SMHa) or its consultants assumes no liability for your use of electronic files provided by SMHa. SMHa shall not be responsible for any error or malfunction in the translation, interpretation or use of this electronic information. SMHa does not assume any responsibility arising out of our provision of electronic information or the sufficiency of any drawings prepared based upon this information. In addition, by using this file you agree, to the fullest extent permitted by law, to indemnify and hold SMHa harmless from any damage, liability, or cost, including reasonable attorney's fees and costs of defense, arising from any use or reuse of electronic files provided by SMHa by you, or any person or entity which acquires or obtains the electronic files from or through you. SMHa makes no warranties, either expressed or implied, of merchantability or fitness for any purpose of the electronic files. In no event shall SMHa be liable for any loss of profit or any damages. SMHa hereby reserves its common law copyright to these documents, any associated specifications, design concepts, details and ideas. These documents, specifications design concepts, details and ideas shall not be reproduced, revised or copied in whole or in part, nor shall they be distributed to any other parties without written permission from SMHa. These files are the sole property of SMHa and are intended for archive and record purposes only and shall not be copied in whole or in part without written permission from SMHa.

1.4 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

B. Submittals Schedule: Comply with requirements in Division 01 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. 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.

1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 10 days for review of each resubmittal.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name and address of Architect.
    d. Name and address of Contractor.
    e. Name and address of subcontractor.
    f. Name and address of supplier.
    g. Name of manufacturer.
    h. Submittal number or other unique identifier, including revision identifier.
    i. Number and title of appropriate Specification Section.
    j. Drawing number and detail references, as appropriate.
    k. Location(s) where product is to be installed, as appropriate.
    l. Other necessary identification.

E. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.

F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
2. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

1. Transmittal Form: Use Form attached, or similar, at end of this section.
2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked "Approved."

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals with mark indicating "Approved" taken by Architect.

## PART 2 - PRODUCTS

### 2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
    a. Manufacturer's written recommendations.
    b. Manufacturer's product specifications.
    c. Manufacturer's installation instructions.
    d. Standard color charts.
    e. Manufacturer's catalog cuts.
    f. Wiring diagrams showing factory-installed wiring.
    g. Printed performance curves.
    h. Operational range diagrams.
    i. Mill reports.
    j. Standard product operation and maintenance manuals.
    k. Compliance with specified referenced standards.
    l. Testing by recognized testing agency.
    m. Application of testing agency labels and seals.
    n. Notation of coordination requirements.
4. Submit Product Data before or concurrent with Samples.
5. Number of Copies: Submit electronic PDF file, or three copies of Product Data, for submittals to be reviewed by Architect unless otherwise indicated. Architect will return two copies. Mark up and retain one returned copy as a Project Record Document.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Dimensions.
b. Identification of products.
c. Fabrication and installation drawings.
d. Roughing-in and setting diagrams.
e. Shopwork manufacturing instructions.
f. Templates and patterns.
g. Schedules.
h. Design calculations.
i. Compliance with specified standards.
j. Notation of coordination requirements.
k. Notation of dimensions established by field measurement.
l. Relationship to adjoining construction clearly indicated.
m. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches .
3. Number of Copies: Submit electronic PDF file, or three copies of Product Data, for submittals to be reviewed by Architect unless otherwise indicated. Architect will return two copies. Mark up and retain one returned copy as a Project Record Document..

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

a. Generic description of Sample.
b. Product name and name of manufacturer.
c. Sample source.
d. Number and title of appropriate Specification Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
4. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Number of Samples: Submit two sets of Samples. Architect will retain one Sample set; remainder will be returned.

E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product.
2. Number and name of room or space.
3. Location within room or space.
4. Number of Copies: Submit three copies of product schedule or list, unless otherwise indicated. Architect will return two copies.

a. Mark up and retain one returned copy as a Project Record Document.

F. Submittals Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

H. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements specified in Division 1 Section "Quality Requirements."

B. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

D. Certificates: Prepare written statements on manufacturer's letterhead certifying that item complies with requirements in the Contract Documents. Include evidence of experience where required.

E. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

F. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

G. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

H. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

I. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

J. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

### 3.2 ARCHITECT'S/ ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. Approved: Where submittals are marked "Approved," that part of Work covered by submittal may proceed provided it complies with requirements of Contract Documents; final acceptance will depend upon that compliance.
2. Approved as Noted: When submittals are marked "Approved as Noted," that part of Work covered by submittal may proceed provided it complies with notations or corrections on submittal and requirements of Contract Documents; final acceptance will depend on that compliance.
3. Revise and Resubmit: When submittal is marked "Revise and Resubmit," do not proceed with that part of Work covered by submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare new submittal in accordance with notations; resubmit without delay. Repeat if necessary to obtain different action mark.
4. Other Action: Where submittal is primarily for information or record purposes, special processing or other activity, submittal will be returned, marked "Not Reviewed".

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

**SUBMITTAL FORM**
Whaley House Renovation - Exterior Stabilization

State No. H27-I909
SMHa No. 0906.05
GC No.

Stubbs Muldrow Herin architects, inc.
400 Hibben Street
Mount Pleasant, SC 29464

| | | | |
|---|---|---|---|
| Spec No. | | Submittal Date | |
| Submittal Name | | Rec'd by Arch Date | |

| | | | |
|---|---|---|---|
| | | | *insert* **Contractor Name** |
| Tracking | Original<br>Re-submittal | Address<br>Phone<br>eMail | |
| | | | *insert* **Subcontractor Name** |
| Fwd To /On: | | Address<br>Phone<br>eMail | |
| | | | *insert* **Supplier Name** |
| Due to GC Date: | | Address<br>Phone<br>eMail | |

**Contractor's Stamp**

**Architect's Action/Stamp**

END OF SECTION 013300

SECTION 013591 - HISTORIC TREATMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general protection and treatment procedures for designated exterior historic surfaces in the Project.

B. Related Requirements:

1. Section 040120 "Maintenance of Unit Masonry" for specific requirements for brick masonry restoration.

1.3 DEFINITIONS

A. Consolidate: To strengthen loose or deteriorated materials in place.

B. Dismantle: To disassemble and detach items by hand from existing construction to the limits indicated, using small hand tools and small one-hand power tools, so as to protect nearby historic surfaces; and legally dispose of dismantled items off-site, unless indicated to be salvaged or reinstalled.

C. Existing to Remain: Existing items that are not to be removed or dismantled.

D. Historic: Spaces, areas, materials, and overall appearance, which are important to the successful restoration and reconstruction as determined by Architect. Designated historic surfaces are indicated on Drawings and scheduled in this Section.

E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.

F. Reconstruct: To remove existing item, replicate damaged or missing components, and reinstall in original position.

G. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

H. Reinstall: To protect removed or dismantled item, repair and clean it as indicated for reuse, and reinstall it in original position, or where indicated.

I. Remove: Specifically for historic spaces, areas, rooms, and surfaces, the term means to detach an item from existing construction to the limits indicated, using hand tools and hand-operated power equipment, and legally dispose of it off-site, unless indicated to be salvaged or reinstalled.

J. Repair: To correct damage and defects, retaining existing materials, features, and finishes while employing as little new material as possible. Includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

K. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

L. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.

M. Reproduce: To fabricate a new item, accurate in detail to the original, and in either the same or a similar material as the original, unless otherwise indicated.

N. Restore: To consolidate, replicate, reproduce, repair, and refinish as required to achieve the indicated results.

O. Retain: To keep existing items that are not to be removed or dismantled.

P. Reversible: New construction work, treatments, or processes that can be removed or undone in the future without damaging historic materials unless otherwise indicated.

Q. Salvage: To protect removed or dismantled items and deliver them to Owner[ ready for reuse].

R. Stabilize: To provide structural reinforcement of unsafe or deteriorated items while maintaining the essential form as it exists at present; also, to reestablish a weather-resistant enclosure.

S. Strip: To remove existing finish down to base material unless otherwise indicated.

## 1.4 MATERIALS OWNERSHIP

A. Historic items of interest or value to Owner may be encountered during removal and dismantling work remain Owner's property. Carefully dismantle and salvage each item or object.

B. The Work will involve the replacement of deteriorated materials. Selected materials shall be retained as a reference for replacement work. Dispose of material only upon approval of the Architect or Owner's Representative.

## 1.5 INFORMATIONAL SUBMITTALS

A. Construction Schedule for Historic Treatments: Indicate for entire Project the following for each activity to be performed in historic spaces, areas, and rooms, and on historic surfaces:

1. Detailed sequence of historic treatment work, with starting and ending dates, coordinated with Owner's continuing operations and other known work in progress.

B. Qualification Data: For historic masonry workers.

C. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by Contractor's historic treatment operations.

D. Inventory of Salvaged Items: After removal or dismantling work is complete, submit a list of items that have been salvaged.

1.6 QUALITY ASSURANCE

A. Contractor Qualifications: An experienced firm regularly engaged in historic treatments similar in nature, materials, design, and extent to this work as specified in each section below, and that has completed a minimum of five recent projects with a record of successful in-service performance that demonstrate the firm's qualifications to perform this work.

1. Field Supervisor Qualifications: Full-time supervisors experienced in historic treatment work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on Project site during times that historic treatment work is in progress. Supervisors shall not be changed during Project except for causes beyond the control of the Contractor.

2. Worker Qualification: Persons who are experienced in historic treatment work of types they will be performing. Having demonstrated a minimum of 5 years of related experience and 5 completed projects.

a. Section 04120 - Maintenance of Unit Masonry.

B. Work Program: Prepare a written plan for the Project, including each phase or process and protection of surrounding materials during operations. Describe in detail materials, methods, and equipment to be used for each phase of work. Show compliance with indicated methods and procedures specified in this and other Sections.

1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
2. Include plans clearly marked to show debris hauling routes and locations and details of temporary protective barriers.

C. Mockups: Prepare mockups of specific historic treatment procedures specified to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

D. Regulatory Requirements: Comply with notification regulations of authorities having jurisdiction before beginning removal and dismantling work. Comply with hauling and disposal regulations of authorities having jurisdiction.

E. Standards: Comply with ANSI/ASSE A10.6.

F. Preconstruction Conference: Conduct conference at Project site.

1. General: Review methods and procedures related to historic treatment including, but not limited to, the following:

a. Review manufacturer's written instructions for precautions and effects of historic treatment procedures on materials, components, and vegetation.
b. Review and finalize historic treatment construction schedule; verify availability of materials, equipment, and facilities needed to make progress and avoid delays.
c. Review qualifications of personnel assigned to the work and assign duties.
d. Review material application, work sequencing, tolerances, and required clearances.
e. Review areas where existing construction is to remain and requires protection.

2. Removal and Dismantling:

a. Inspect and discuss condition of construction to be removed or dismantled.
b. Review requirements of other work that relies on substrates exposed by removal and dismantling work.

1.7 STORAGE AND PROTECTION OF HISTORIC MATERIALS

A. Salvaged Historic Materials:

1. Clean only loose debris from salvaged historic items unless more extensive cleaning is indicated.
2. Store items in a secure area until delivery to Owner.

B. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after historic treatment and construction work in the vicinity is complete.

1.8 PROJECT CONDITIONS

A. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

B. Storage or sale of removed or dismantled items on-site is not permitted unless otherwise indicated.

1.9 COORDINATION

A. Coordinate historic treatment procedures in this Section with public circulation patterns at Project site with Authorities having jurisdiction. Public circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work. Plan and execute the Work accordingly.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 HISTORIC REMOVAL AND DISMANTLING EQUIPMENT

A. Removal Equipment: Use only hand-held tools except as follows or unless otherwise approved by Architect on a case-by-case basis:

B. Dismantling Equipment: Use manual, hand-held tools, except as follows or otherwise approved by Architect on a case-by-case basis:

1. Hand-held power tools are permitted only as submitted in the historic treatment program. They must be adjustable so as to penetrate or cut only the thickness of material being removed.

3.2 EXAMINATION

A. Preparation for Removal and Dismantling: Examine construction to be removed or dismantled to determine best methods to safely and effectively perform removal and dismantling work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed or dismantled and location of utilities and services to remain that may be hidden by construction that is to be removed or dismantled.

1. Verify that affected utilities have been disconnected and capped.
2. Inventory and record the condition of items to be removed and dismantled for reinstallation or salvage.
3. Before removal or dismantling of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.
4. If in the opinion of the Contractor, any removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures as a result of removal and dismantling work notify the Architect immediately.

B. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

C. Perform surveys as the Work progresses to detect hazards resulting from historic treatment procedures.

3.3 PROTECTION, GENERAL

A. Ensure that supervisory personnel are on-site and on duty when historic treatment work begins and during its progress.

B. Protect persons, motor vehicles, surrounding surfaces of the wall structure, building site, plants, and surrounding buildings from harm resulting from historic treatment procedures.

1. Use only proven protection methods, appropriate to each area and surface being protected.
2. Provide barricades, barriers, and temporary directional signage to exclude public from areas where historic treatment work is being performed.
3. Contain dust and debris generated by removal and dismantling work and prevent it from reaching the public or adjacent surfaces.
4. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.

C. Temporary Protection of Historic Materials:

1. Protect existing historic materials with temporary protections and construction. Do not deface or remove existing materials.
2. Do not attach temporary protection to historic surfaces except as indicated as part of the historic treatment program and approved by Architect.

D. Utility and Communications Services:

1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by the historic treatment work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for the historic treatment work.
3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

E. Existing Roofing: Prior to the start of work in an area, install roofing protection where the roof will be exposed to construction activity.

## 3.4 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm or damage resulting from applications of chemical cleaners.

B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in historic treatment program. Use covering materials and masking agents that are waterproof, UV resistant, and will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials staining.

C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.

D. Neutralize and collect alkaline and acid wastes and legally dispose of off Owner's property.

E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

## 3.5 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following.

1. Comply with NFPA 241 requirements unless otherwise indicated.
2. Remove and keep area free of combustibles including, rubbish, paper, waste, and chemicals, except to the degree necessary for the immediate work.

    a. If combustible material cannot be removed, provide fire blankets to cover such materials.

3. Prohibit smoking by all persons within Project work and staging areas.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or highly combustible materials, including welding, torch-cutting, soldering, brazing, paint removal with heat, or other operations where open flames or implements utilizing high heat or combustible solvents and chemicals are anticipated:

1. Do not perform work with heat-generating equipment in or near areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
2. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
3. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
4. Fire Watch: Before working with heat-generating equipment or highly combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows.

    a. Train each fire watch in the proper operation of fire-control equipment and alarms.

b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
d. Have fire watch perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work at each area of Project site to detect hidden or smoldering fires and to ensure that proper fire-prevention is maintained.
e. Maintain fire-watch personnel at each area of Project site until 60 minutes after conclusion of daily work.

C. Fire Extinguishers, Fire Blankets, and Rag Buckets: Maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire watch are trained in fire-extinguisher and blanket operation.

## 3.6 GENERAL HISTORIC TREATMENT

A. Ensure that supervisory personnel are present when historic treatment work begins and during its progress.

B. Halt the process of deterioration and stabilize conditions unless otherwise indicated. Perform work as indicated on Drawings. Follow the procedures in subparagraphs below and procedures approved in historic treatment program:

1. Retain as much existing material as possible.
2. Use historically accurate repair and replacement materials and techniques unless otherwise indicated.
3. Record existing work before each procedure (preconstruction) and progress during the work with digital preconstruction photographs.

C. Notify Architect of visible changes in the integrity of material or components whether due to environmental causes including biological attack, UV degradation, freezing, or thawing; or due to structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

## 3.7 HISTORIC REMOVAL AND DISMANTLING

A. General: Have removal and dismantling work performed by a qualified individual. Ensure that workers field supervisors are present when removal and dismantling work begins and during its progress.

B. Perform work according to the historic treatment program and approved mockup(s).

1. Provide supports or reinforcement for existing construction that becomes temporarily weakened by the work, until the work is completed.
2. Perform cutting by hand or with small power tools wherever possible. Cut holes and slots neatly to size required, with minimum disturbance of adjacent work.
3. Do not drill or cut columns, beams, joints, girders, structural slabs, or other structural supporting elements, without having Contractor's professional engineer's written approval for each location before such work is begun.

C. Water-Mist Sprinkling: Use water-mist sprinkling and other wet methods to control dust only with adequate, approved procedures and equipment that ensure that such water will not create a hazard or adversely affect other building areas or materials.

D. Unacceptable Equipment: Keep equipment that is not permitted for historic removal or dismantling work away from the vicinity where such work is being performed.

E. Removing and Dismantling Items on or near Historic Surfaces:

1. Use only dismantling tools and procedures within 12 inches of historic surface. Do not use pry bars. Protect historic surface from contact with or damage by tools.
2. Unfasten items to be removed, in the opposite order from which they were installed.
3. Support each item as it becomes loosened to prevent stress and damage to the historic surface.
4. Dismantle anchorages.

END OF SECTION 013591

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

D. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

I. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

J. Special Inspections: Not required on this project, however, the Owner reserves the right to conduct special inspections reviewing the quality of the Work at any time during the construction period.

## 1.4 CONFLICTING REQUIREMENTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

## 1.5 REGULATORY REQUIREMENTS

A. Copies of Regulations: Obtain copies of the applicable regulations and retain at Project site to be available for reference by parties who have a reasonable need.

## 1.6 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

## 1.7 QUALITY CONTROL

A. Owner Responsibilities: For other tests or inspections where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services for testing indicated in individual sections and as otherwise required by authorities having jurisdiction.

C. Special Tests and Inspections: Owner reserves the right to engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

# PART 2 - PRODUCTS (Not Used)

# PART 3 - EXECUTION

## 3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
2. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1. Section 013591 for Temporary Protections, Mockups
2. Section 024119 for Dust and Noise Control.

1.2 SUMMARY

A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

B. Temporary utilities include, but are not limited to, the following:

1. Water service and distribution.
2. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.
3. Electric power service.
4. Telephone service.

1.3 USE CHARGES

A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Architect and shall be included in the Contract Sum.

B. Water Service: Pay water service use charges, whether metered or otherwise, for water used by all entities engaged in construction activities at Project site.

C. Electric Power Service: Pay electric power service use charges, whether metered or otherwise, for electricity used by all entities engaged in construction activities at Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Temporary facilities, utility hookups, staging areas, parking areas for construction personnel.

B. Security and Protection Plan. Submit proposed protection plan for Owner's information and coordination.

1.5 QUALITY ASSURANCE

A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.

1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
2. 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.

1.6 PROJECT CONDITIONS

A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.

1. Temporary Use of Permanent Facilities: Installer of each permanent service shall 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.

B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:

1. Keep temporary services and facilities clean and neat.
2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.

B. Water: Potable.

2.2 EQUIPMENT

A. General: Provide equipment suitable for use intended.

B. Field Office: Contractor may use first floor of existing Carriage House building for temporary office space. Contractor shall be responsible for permits, utilities and fire safety.

C. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

D. Drinking-Water Fixtures: bottled-water drinking-water units, including paper cup supply.

E. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

F. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

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.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. 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. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

B. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction until permanent water service is in use. Sterilize temporary water piping before use.

1. Connect temporary service to Owner's service, as directed by Owner.

C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.

D. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.

1. Connect temporary service to Owner's existing power source, as directed by electric company officials.

E. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.

F. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.

G. Telephone Service: Provide telephone service throughout construction period.

3.3 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. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. 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.

## 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. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day

C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

D. Temporary Enclosures: Provide temporary enclosures for protection of the public from potential hazards of the project site including but not limited to construction operations, and equipment. Protect construction, both in progress and completed, from exposure, foul weather, other construction operations, and similar activities.

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

1.3 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use Form included in Project Manual.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified material or product cannot be provided.
b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.

j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 3 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 10 days of receipt of request, or 5 days of receipt of additional information or documentation, whichever is later.

a. Form of Acceptance: Change Order.
b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

## 1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.

1.5 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.

B. Product Selection Procedures:

1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.

2. Manufacturer: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named.

## 2.2 PRODUCT SUBSTITUTIONS

A. Timing: Architect will consider requests for substitution if received within 60 days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Architect.

B. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.

# PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017000 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. General installation of products.
3. Progress cleaning.
4. Starting and adjusting.
5. Protection of installed construction.
6. Correction of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical utilities and other construction affecting the Work.

B. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of materials with existing conditions and materials.
2. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Where portions of the Work are indicated to fit to other construction, verify dimensions of other

construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

## 3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to existing conditions. If discrepancies are discovered, notify Architect promptly.

B. General:

1. Establish benchmarks and control points to set lines and levels of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions. Do not use electronic files scaled. Actual dimensions in the field shall govern for overall quantities, detailed dimensions indicated on Drawings shall govern unless noted otherwise.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.

C. Site Improvements: Locate existing site conditions, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations that may affect the Work.

D. Construction Lines and Levels: Locate and lay out control lines and levels where existing work may need to be replaced to ensure accurate reconstruction. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

## 3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

## 3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

B. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

C. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

D. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

E. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

F. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

G. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

## 3.6 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F .
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

## 3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with supplier's written instructions for temperature and relative humidity.

## 3.8 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

END OF SECTION 017000

SECTION 017329 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

1.3 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior in a manner that would, in Architect's opinion, reduce the project's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

## 3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 017329

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 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. Project Record Documents.
3. Operation and maintenance manuals.
4. Warranties.
5. Instruction of Owner's personnel.
6. Final cleaning.

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. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Prepare and submit Project Record Documents.
5. Deliver extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
6. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
8. Complete final cleaning requirements.
9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion, in accordance with General Conditions of the Contract for Construction and Standard Supplementary Conditions. On receipt of request, Architect will either proceed with scheduling the inspection or notify Contractor of unfulfilled requirements. Architect 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 Architect, 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 CERTIFICATE OF OCCUPANCY

A. A Certificate of Occupancy will not be required for this project.

## 1.5 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 01 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect 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.

## 1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each 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. Use CSI Form 14.1A or other Architect approved form.

## 1.7 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.

1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
    a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
    b. Accurately record information in an understandable drawing technique.
    c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
2. Mark important additional information that was either shown schematically or omitted from original Drawings.
3. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
4. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

C. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.

## 1.8 MAINTENANCE MANUALS

A. Assemble a complete set of material and maintenance data.

1. Maintenance Data:
    a. Mortar materials.
    b. Replacement Brick.
    c. Cleaning materials.
    d. Other relevant material that will assist in future maintenance and restoration projects.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "MAINTENANCE MANUAL," Project name, and subject matter of contents.

## 1.9 WARRANTIES

A. Submittal Time: Submit written warranties at Substantial Completion. Warranty period shall commence at date of Substantial Completion, exclusive of any time of operation during construction.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (115-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

## 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. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

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 017700

# 020010 - EXISTING CONDITIONS AND PHOTOGRAPHS

## 1.1 RELATED DOCUMENTS

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

1. Section 020010 - Photographs on pages following this section.

## 1.2 SUMMARY

A. Bidders are urged to visit the site and examine the existing conditions. Bidders submitting a bid represent that they accept the condition of the wall and intend to provide all necessary materials and labor to perform the Work as described in the Documents.

B. The numbered images on the following 27 pages are provided for information and correlate to the numbers on the drawings of each wall segment and are provided for the bidder's information.

C. Larger higher resolution images are available from the office of the Architect, Stubbs Muldrow Herin architects, 400 Hibben Street, Mount Pleasant, SC 29464 (843) 881-7642 upon request.

END OF SECTION 020010

(1), Greene Street - Campus Elevation
Partial height wall with major vertical crack.

(2), Greene Street - Campus Elevation
Partial height wall to full height wall transition.

(3), Greene Street - Campus Elevation
Full height wall transition with major diagonal crack.

(4), Greene Street - Campus Elevation
Full height wall.

(5), Greene Street - Campus Elevation
Full height wall. Repointing required typ.

(6), Greene Street - Campus Elevation
Full height wall. Cap replacement and repair required.

(7), Greene Street - Campus Elevation
Full height wall. Cap replacement and repair required.

(8), Greene Street - Campus Elevation
Full height wall. Minor cap replacement and repair required.

(9), Greene Street - Campus Elevation
Full height wall. Adjacent partial height wall with different brick.

(10), Greene Street - Campus Elevation
Full height wall. Cap replacement and repair required.

(11), Greene Street - Campus Elevation
Full height wall. Repointing and vegatation removal required. Existing conduit removal required.

(12), Greene Street - Campus Elevation
Full height wall. Repointing and vegatation removal required. Existing conduit removal required.

(13), Greene Street - Campus Elevation
Full height wall. Repointing and vegatation removal required. Existing conduit removal required.

(14), Greene Street - Campus Elevation
Full height wall. Repointing and vegatation removal required. Existing landscaping to be trimmed back.

(15), Greene/Sumter Street - Campus Elevation - Corner
Full height wall. Repointing and vegatation removal required. Existing conduit removal required. Major vertical crack at large pier.

(16), Sumter Street - Campus Elevation
Full height wall. Repointing required.

(17), Sumter Street - Campus Elevation
Full height wall. Repointing required. Major vertical crack.

(18), Sumter Street - Campus Elevation
Full height wall. Repointing required.

(19), Sumter Street - Campus Elevation
Full height wall.

(20), Sumter Street - Campus Elevation
Full height wall with single brick jog and tree.

(21), Sumter Street - Campus Elevation
Full height wall. Brick face and cap built up residue.

(22), Sumter Street - Campus Elevation
Full height wall. Major mortar repointing.

(23), Sumter Street - Campus Elevation
Full height wall. New photo required.


(24), Sumter Street - Campus Elevation
Full height wall. New photo required.

(25), Sumter Street - Campus Elevation
Full height wall. Cedar tree close to wall.

(26), Sumter Street - Campus Elevation
Full height wall. Pier with different mortar. Cap with residue.

(27), Sumter Street - Campus Elevation
Full height wall. Close vegetation removal required.

(28), Sumter Street - Campus Elevation
Full height wall. Different mortar across wall.

(29), Sumter Street - Campus Elevation
Full height wall. Cap repair required.

(30), Sumter Street - Campus Elevation
Full height wall. Cap repair required.

(31), Sumter Street - Campus Elevation
Full height wall. Evaluate differ mortars in area between piers.

(32), Sumter Street - Campus Elevation
Full height wall. Cap repair required. Remove vegatation.

(33), Sumter Street - Campus Elevation
Full height wall. Cap repair required.

(34), Sumter Street - Campus Elevation
Full height wall and adjacent wall. Cap repair required.

(35), Sumter Street - Campus Elevation
Entry with full height wall and adjacent wall. Cap to be repaired.

(36), Sumter Street - Campus Elevation
Entry with full height wall and adjacent wall attached to pier. Cap repair required.


(37), Greene Street - Street Elevation
Partial height wall with major vertical crack.

(38), Greene Street - Street Elevation
Partial height wall with major vertical crack. Transition to full height wall.

(39), Greene Street - Street Elevation
Full height wall. Vegetation issues.

(40), Greene Street - Street Elevation
Full height wall. Vegetation issues. Cap repair.

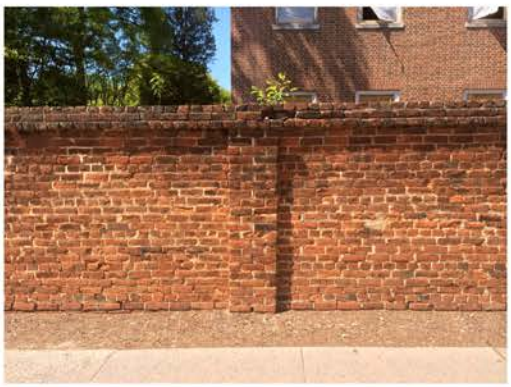
(41), Greene Street - Street Elevation
Full height wall. Cap repair.

(42), Greene Street - Street Elevation
Full height wall. Cap repair.

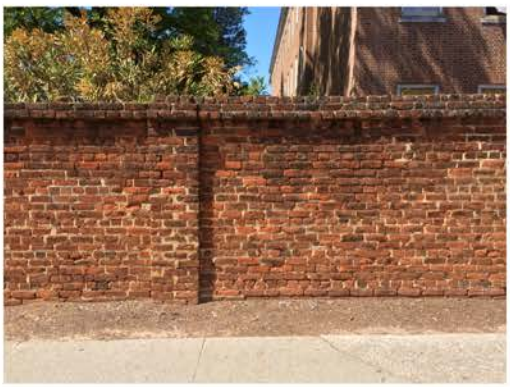
(43), Greene Street - Street Elevation
Full height wall.

(44), Greene Street - Street Elevation
Full height wall. Missing brick.

(45), Greene Street - Street Elevation
Full height wall.



(46), Greene Street - Street Elevation
Full height wall. Cap repair. Vegetation issues.



(47), Greene Street - Street Elevation
Full height wall.


(48), Greene Street - Street Elevation
Full height wall. Corner Pier. Cap repair issues.

(49), Sumter Street - Street Elevation
Full height wall. Corner Pier.

(50), Sumter Street - Street Elevation
Full height wall.

(51), Sumter Street - Street Elevation
Full height wall. Multiple repointing issues.

(52), Sumter Street - Street Elevation
Full height wall. Brick bump out. Multiple repointing issues.

(53), Sumter Street - Street Elevation
Full height wall. Brick bump out. Multiple repointing issues.

(54), Sumter Street - Street Elevation
Full height wall. Repair cap. Large tree in background.

(55), Sumter Street - Street Elevation
Full height wall. New bick repair evident.

(56), Sumter Street - Street Elevation
Full height wall. Multiple repointing issues.


(57), Sumter Street - Street Elevation
Full height wall. Full height pier at entry with sign.

(58), Sumter Street - Street Elevation
Full height wall. Full height pier at entry.

(59), Sumter Street - Street Elevation
Full height wall with pier.

(60), Sumter Street - Street Elevation
Full height wall with pier. Multiple face brick cracking.

(61), Sumter Street - Street Elevation
Full height wall with pier. Multiple brick face cracking.


(62), Sumter Street - Street Elevation
Full height wall with two piers. Major repair to small pier.

(63), Sumter Street - Street Elevation
Full height wall with pier. Cap repair. Vegetation issues.

(64), Sumter Street - Street Elevation
Full height wall with 2 piers. Cap repair. Repointing required between piers.

(65), Sumter Street - Street Elevation
Full height wall with small and large pier. Repointing required.

(66), Sumter Street - Street Elevation
Full height wall with two piers. Cap repair required. Vegeatation issues.

(67), Sumter Street - Street Elevation
Full height wall with pier. Cap repair required.

(68), Sumter Street - Street Elevation
Full height wall with multiple entry piers. Cap repair required.

(69), Sumter Street - Street Elevation
Full height wall with multiple entry piers. Left side of entry.

(70), Sumter Street - Street Elevation
Full height wall with single pier.

(71), Sumter Street - Street Elevation
Full height wall with single pier. Cap repair required. Vegetation issues.

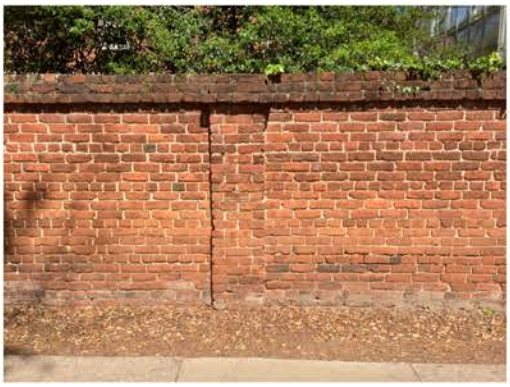
(72), Sumter Street - Street Elevation
Full height wall with single pier. Multiple mortar and repointing issues.

(73), Sumter Street - Street Elevation
Full height wall with single pier. Multiple mortar and repointing issues. Vegetation issues at cap.

(74), Sumter Street - Street Elevation
Full height wall with single pier. Multiple mortar and repointing issues. Vegetation issues at cap.

(75), Sumter Street - Street Elevation
Full height wall with single pier. Multiple mortar and repointing issues. Cap repair required.

(76), Sumter Street - Street Elevation
Full height wall with single pier. Multiple mortar and repointing issues. Vegetation issues at cap.



(77), Sumter Street - Street Elevation
Full height wall with single pier. Multiple mortar and repointing issues. Cap repair required..

(78), Sumter Street - Street Elevation
Full height wall with single pier. Multiple mortar and repointing issues. Base repointing and repair required.

(79), Sumter Street - Street Elevation
Full height wall with single pier. Large portion of the wall needs replacing.

(80), Sumter Street - Street Elevation
Full height wall with single pier. Large portion of the wall needs replacing. Bricks missing.

(81), Sumter Street - Street Elevation
Full height wall with single pier. Base missing mortar.

(82), Sumter Street - Street Elevation
Full height wall. Multiple mortar and repointing issues.

(83), Sumter Street - Street Elevation
Full height wall with large entry single pier. Multiple mortar and repointing issues and missing brick.

(84), Full height wall with large entry single pier.

(85), Full height wall with large entry single pier. Gates and entry plaque.

(86), Sumter Street - Campus Elevation
Full height wall -new photo required.

(87), Sumter Street - Campus Elevation
Full height wall. Cap repair required.

(88), Sumter Street - Campus Elevation
Full height wall. Vertical cracks at pier.

(89), Sumter Street - Campus Elevation
Full height wall. Multiple vertical cracks.

(90), Sumter Street - Campus Elevation
Full height wall.

(91), Sumter Street - Campus Elevation
Full height wall. Cap repair required. Sign in wall.

(92), Sumter Street - Campus Elevation
Full height wall.

(93), Sumter Street - Campus Elevation
Full height wall. Transition to partial height wall with vertical rail.

(94), Sumter Street - Campus Elevation
Full height wall with entry piers. Transition to partial height wall with vertical rail.

(95), Sumter Street - Campus Elevation
Large Entry Pier with vertical rail and gate.

(96), Sumter Street - Campus Elevation
Large Entry Pier with vertical rail and gate.

(97), Sumter Street - Campus Elevation
Large Entry Pier with vertical rail and gate.

(98), Sumter Street - Street Elevation
Large Entry Pier with vertical rail.

(99), Sumter Street - Street Elevation
Large Entry Pier with vertical rail and gate.

(100), Sumter Street - Street Elevation
Partial height wall with vertical rail.

(101), Sumter Street - Street Elevation
Partial height wall with vertical rail.

(102), Sumter Street - Street Elevation
Partial height wall

(103), Sumter Street - Street Elevation
Partial height wall

(104), Sumter Street - Street Elevation
Partial height wall

(105), Sumter Street - Street Elevation
Partial height wall

(106), Sumter Street - Street Elevation
Partial height wall

(107), Sumter Street - Street Elevation
Partial height wall

(108), Sumter Street - Street Elevation
Partial height wall

(109), Sumter Street - Street Elevation
Partial height wall

(110), Sumter Street - Street Elevation
Partial height wall

(111), Sumter Street - Street Elevation
Partial height wall

(112), Sumter Street - Street Elevation
Partial height wall

(113), Sumter Street - Street Elevation
Partial height wall

(114), Sumter Street - Street Elevation
Partial height wall

(115), Sumter Street - Street Elevation
Partial height wall

(116), Sumter Street - Street Elevation
Partial height wall

(117), Sumter Street - Street Elevation
Partial height wall

(118), Sumter Street - Street Elevation
Partial height wall

(119), Sumter Street - Street Elevation
Partial height wall with large pier and gate.

(120), Sumter Street - Street Elevation
Partial height wall with large pier and gate.

(121), Sumter Street - Street Elevation
Partial height wall with large pier and gate.

(122), Sumter Street - Street Elevation
Partial height wall with large pier, gate, smaller pier. Signage.

(123), Sumter Street - Street Elevation
Full height wall with small pier. Signage.

(124), Sumter Street - Street Elevation
Full height wall with small pier. Signage.

(125), Sumter Street - Street Elevation
Full height wall. Cap repair.

(126), Sumter Street - Street Elevation
Full height wall with small pier. Vegetation issues.

(127), Sumter Street - Street Elevation
Full height wall with small pier. Multiple vegetation issues.

(128), Sumter Street - Street Elevation
Full height wall with small pier. Vegetation issues.

(129), Sumter Street - Street Elevation
Full height wall. Vegetation issues.

(130), Sumter Street - Street Elevation
Full height wall with small pier. Vegetation issues. Repointing required at multiple areas.

(131), Sumter Street - Street Elevation
Full height wall with small pier. Vegetation issues. Repointing required at multiple areas.

(132), Sumter Street - Street Elevation
Full height wall with small pier.

(133), Sumter Street - Street Elevation
Full height wall with small pier. Incorrect mortar replacement.

(134), Sumter Street - Street Elevation
Full height wall with small pier. Incorrect mortar replacement.

(135), Sumter Street - Street Elevation
Full height wall with small pier. Incorrect mortar replacement.

(136), Sumter Street - Street Elevation
Fulll height wall with small pier. Incorrect mortar replacement.

(137), Sumter Street - Street Elevation
Fulll height wall with small pier. Incorrect mortar replacement.

(138), Sumter Street - Street Elevation
Partial height wall with small pier. Incorrect mortar replacement.

(139), Sumter Street - Street Elevation
Full height wall with small pier. Incorrect mortar replacement. Visible cracking.

(140), Sumter Street - Street Elevation
Full height wall with small pier. Multiple mortar replacement.

(141), Sumter Street - Street Elevation
Full height wall with small pier. Multiple mortar replacement.

(142), Sumter Street - Street Elevation
Low wall with fence. Brick repair/replacement required. Mortar replacement required.

(143), Sumter Street - Street Elevation
Low wall with fence. Brick repair/replacement required. Mortar replacement required.

(144), Sumter Street - Street Elevation
Low wall with fence. Mortar and cap replacement required.

(145), Sumter Street - Street Elevation
Low wall with fence. Mortar and cap replacement required.

(146), Sumter Street - Street Elevation
Low wall with fence. Mortar and cap replacement required. Brick replacement required.

(147), Sumter Street - Street Elevation
Low wall with fence. Mortar and cap replacement required.

(148), Sumter Street - Street Elevation
Low wall with fence and gate. Mortar and cap replacement required.

(149), Sumter Street - Street Elevation
Low wall with fence and gate. Mortar and cap replacement required.

(150), Sumter Street - Street Elevation
Low wall with fence and pier. Mortar and cap replacement required.

(151), Sumter Street - Street Elevation
Low wall with fence. Mortar and cap replacement required. Multiple repointing required.

(152), Sumter Street - Street Elevation
Low wall with fence. Mortar and cap replacement required. Multiple repointing required.

(153), Sumter Street - Street Elevation
Low wall with fence transition to large corner. Mortar and cap replacement required. Multiple repointing required.

(154), Sumter Street - Street Elevation
Low wall with fence transitions to large diagonal corner wall. Mortar and cap replacement required. Multiple repointing and brick repair required.


(155), Sumter Street - Street Elevation
Large diagonal corner wall with small partial height wall and fence.. Mortar and cap replacement required. Multiple repointing and brick repair required.


(156), Pendleton Street - Street Elevation
Large diagonal corner wall with small partial height wall and fence.. Mortar and cap replacement required. Multiple repointing and brick repair required.

(157), Pendleton Street - Street Elevation
Large diagonal corner wall with small partial height wall and fence.. Mortar and cap replacement required. Multiple repointing and brick repair required.

(158), Pendleton Street - Street Elevation
Low wall with fence and pier. Mortar and cap replacement required.

(159), Pendleton Street - Street Elevation
Low wall with fence and pier. Mortar and cap replacement required.

(160), Pendleton Street - Street Elevation
Low wall with fence and pier. Multiple repointing issues.

(161), Pendleton Street - Street Elevation
Low wall with fence and pier. Multiple repointing issues.

(162), Pendleton Street - Street Elevation
Low wall with fence. Multiple repointing issues.

(163), Pendleton Street - Street Elevation
Low wall with fence and pier. Multiple repointing issues.

(164), Pendleton Street - Street Elevation
Low wall with fence. Multiple repointing issues.

(165), Pendleton Street - Street Elevation
Low wall with fence and pier. Multiple repointing issues.

(166), Pendleton Street - Street Elevation
Low wall with fence. Multiple repointing issues.

(167), Pendleton Street - Street Elevation
Low wall with fence and pier. Multiple repointing issues.

(168), Pendleton Street - Street Elevation
Low wall with fence. Multiple repointing issues.

(169), Pendleton Street - Street Elevation
Low wall with fence and pier.  Multiple repointing issues.

(170), Pendleton Street - Street Elevation
Low wall with fence.  Multiple repointing issues.

(171), Pendleton Street - Street Elevation
Low wall with fence and pier.  Multiple repointing issues.

(172), Pendleton Street - Street Elevation
Low wall with fence  Multiple repointing issues.

(173), Pendleton Street - Street Elevation
Low wall with fence and pier.  Multiple repointing issues.

(174), Pendleton Street - Street Elevation
Low wall with fence.  Multiple repointing issues.

(175), Pendleton Street - Street Elevation
Low wall with fence and pier.  Multiple repointing issues.

(176), Pendleton Street - Street Elevation
Low wall with fence.  Multiple repointing issues.

(177), Pendleton Street - Street Elevation
Low wall with fence and multiple piers. Transition to large entry pier.

(178), Pendleton Street - Street Elevation
Low wall with fence and multiple piers. Transition to large entry pier.

(179), Pendleton Street - Street Elevation
Low wall requiring brick and mortar replacement.

(180), Pendleton Street - Street Elevation
Low wall to full height wall requiring brick and mortar replacement.

(181), Pendleton Street - Street Elevation
Full height wall.  Cap and vegetation issues.

(182), Pendleton Street - Street Elevation
Full height wall with pier.  Cap and vegetation issues.

(183), Pendleton Street - Street Elevation
Full height wall with pier.  Cap and vegetation issues.

(184), Pendleton Street - Street Elevation
Full height wall with pier.  Cap and vegetation issues.

(185), Pendleton Street - Street Elevation
Full height wall with pier.  Cap and vegetation issues.

(186), Pendleton Street - Street Elevation
Full height wall with pier.  Cap and vegetation issues.

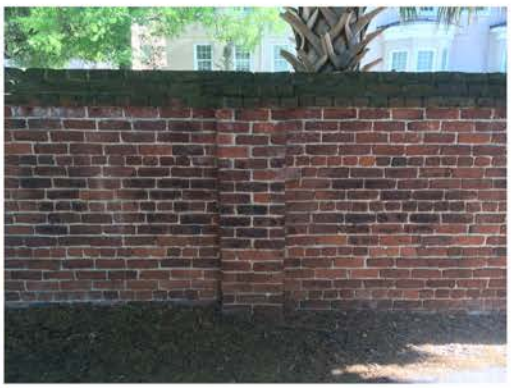
(187), Pendleton Street - Street Elevation
Full height wall.  Cap and vegetation issues.

(188), Pendleton Street - Street Elevation
Full height wall with pier.  Cap and vegetation issues.

(189), Pendleton Street - Street Elevation
Full height wall.  Cap and vegetation issues.

(190), Pendleton Street - Street Elevation
Full height wall with pier.  Cap and vegetation issues.  Multiple mortar repointing required.

(191), Pendleton Street - Street Elevation
Full height wall with pier.  Cap and vegetation issues.  Multiple mortar repointing required.



(192), Pendleton Street - Street Elevation
Full height wall with pier.  Cap and vegetation issues.  Multiple mortar repointing required.

(193), Pendleton Street - Street Elevation
Full height wall with pier. Cap and vegetation issues. Multiple mortar repointing required.

(194), Pendleton Street - Street Elevation
Full height to partial height wall with pier. Multiple mortar repointing required.

(195), Pendleton Street - Street Elevation
Low wall height with piers. Cap and vegetation issues. Vertical cracking.

(196), Pendleton Street - Street Elevation
Low wall height with piers.

(197), Pendleton Street - Street Elevation
Low wall height with piers. Cap and vegetation issues. Vertical cracking.

(198), Pendleton Street - Street Elevation
Full height to partial height wall with pier. Multiple mortar repointing required.

(199), Pendleton Street - Street Elevation
Full height wall with pier. Multiple mortar repointing required.

(200), Pendleton Street - Street Elevation
Full height wall. Multiple mortar repointing required. Vegetation required.

(201), Pendleton Street - Street Elevation
Full height wall with pier. Multiple mortar repointing required.

(202), Pendleton Street - Street Elevation
Full height wall with pier. Multiple repointing required.

(203), Pendleton Street - Street Elevation
Full height wall with pier. Multiple mortar repointing required. Cap replacement. Vegetation issues.

(204), Pendleton Street - Street Elevation
Full height wall. Multiple mortar repointing required. Cap replacement. Vegetation issues.

(205), Pendleton Street - Street Elevation
Full height wall with pier. Multiple mortar repointing required. Cap replacement. Vegetation issues.

(206), Pendleton Street - Street Elevation
Full height wall. Multiple mortar repointing required. Cap replacement. Vegetation issues.

(207), Pendleton Street - Street Elevation
Full height wall with pier. Multiple mortar repointing required. Cap replacement. Vegetation issues.

(208), Pendleton Street - Street Elevation
Full height wall. Multiple mortar repointing required. Cap replacement. Vegetation issues.

(209), Pendleton Street - Street Elevation
Full height wall with pier. Multiple mortar repointing required. Cap replacement. Vegetation issues.

(210), Pendleton Street - Street Elevation
Full height wall with pier. Multiple mortar repointing required. Cap replacement. Vegetation issues.

(211), Pendleton Street - Street Elevation
Full height wall with pier. Multiple mortar repointing required. Cap replacement. Vegetation issues.

(212), Pendleton Street - Street Elevation
Full height wall with pier to curving wall. Multiple mortar repointing required. Visible cracking.

(213), Pendleton Street - Street Elevation
Full height curved wall. Multiple mortar repointing required. Cap replacement. Vegetation issues.

(214), Pendleton Street - Street Elevation
Full height curved wall. Multiple mortar repointing required. Cap replacement. Vegetation issues.

(215), Pendleton Street - Street Elevation
Full height wall with rail. Multiple mortar repointing required. Wall to masonry building connection.

(216), Sumter Street - Campus Elevation
Partial height wall with vertical rail.

(217), Sumter Street - Campus Elevation
Partial height wall with vertical rail.

(218), Sumter Street - Campus Elevation
Partial height wall with vertical rail.

(219), Sumter Street - Campus Elevation
Partial height wall with vertical rail.

(220), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.

(221), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.

(222), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.

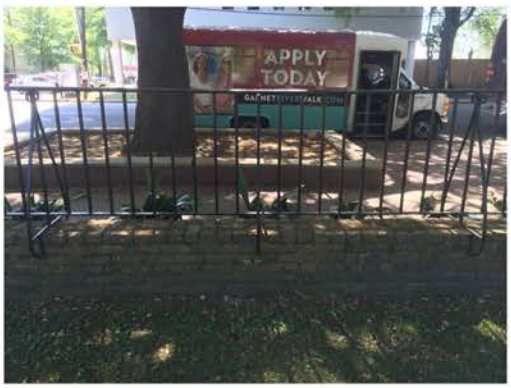
(223), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.

(224), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.

(225), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.

(226), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.


(227), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.




(228), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.


(229), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.


(230), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.


(231), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.


(232), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.

(233), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.

(234), Sumter Street - Campus Elevation
Partial height wall with vertical rail. Vegetation issues typ.

(235), Sumter Street - Campus Elevation
Partial height wall with vertical rail to pier.

(236), Sumter Street - Campus Elevation
Partial height wall with vertical rail to large stone- brick pier.

(237), Sumter Street - Campus Elevation
Partial height wall with vertical rail to large stone bick pier.

(238), Sumter Street - Campus Elevation
Full height wall with vertical rail to large stone bick pier. Gate.

(239), Sumter Street - Campus Elevation
Full height wall with vertical rail to large stone bick pier. Gate.

(240), Sumter Street - Campus Elevation
Full height wall - two piers.

(241), Sumter Street - Campus Elevation
Full height wall - two piers.

(242), Sumter Street - Campus Elevation
Full height wall - single entry pier.

(243), Sumter Street - Campus Elevation
Full height wall to partial height wall. Multiple repointing required.

(244), Sumter Street - Campus Elevation
Full height wall to partial height wall. Multiple repointing required.

(245), Sumter Street - Campus Elevation
Full height wall to partial height wall with pier. Multiple repointing required.

(246), Sumter Street - Campus Elevation
Full height wall. Multiple repointing required. Vegetation issues.

(247), Sumter Street - Campus Elevation
Full height wall. Multiple repointing required. Vegetation issues.

(248), Sumter Street - Campus Elevation
Full height wall. Multiple repointing required. Vegetation issues.

(249), Sumter Street - Campus Elevation
Full height wall with pier. Multiple repointing required. Pole adjacent.

(250), Sumter Street - Campus Elevation
Full height wall. Multiple repointing required.

(251), Sumter Street - Campus Elevation
Full height wall with pier. Multiple repointing required. Vegetation issues.

(252), Sumter Street - Campus Elevation
Full height wall. Multiple repointing required. Cap work required.

(253), Sumter Street - Campus Elevation
Full height wall with adjacent partial height wall. Multiple repointing required. Cap work required.

(254), Sumter Street - Campus Elevation
Full height wall. Multiple repointing required. Cap work required.

(255), Sumter Street - Campus Elevation
Full height wall with pier. Multiple repointing required. Cap work required.

(256), Sumter Street - Campus Elevation
Full height wall with partial height wall. Multiple repointing required. Cap work required.

(257), Sumter Street - Campus Elevation
Full height wall with pier. Multiple repointing required. Cap work required.

(258), Sumter Street - Campus Elevation
Full height wall. Multiple repointing required. Large tree.

(259), Sumter Street - Campus Elevation
Partial height wall with metal fence. Multiple repointing required.

(260), Sumter Street - Campus Elevation
Partial height wall with metal fence. Multiple repointing required. Cap work required.

(261), Sumter Street - Campus Elevation
Partial height wall with metal fence. Multiple repointing required. Cap work required.

(262), Sumter Street - Campus Elevation
Partial height wall with metal fence. Multiple repointing required. Cap work required.

(263), Sumter Street - Campus Elevation
Partial height wall with metal fence. Multiple repointing required. Cap work required. Metal to mortar connection needs work.

(264), Sumter Street - Campus Elevation
Partial height wall with metal fence. Multiple repointing required. Cap work required. Metal to mortar connection needs work.

(265), Sumter Street - Campus Elevation
Partial height wall with metal fence. Multiple repointing required. Cap work required. Metal to mortar connection needs work.

(266), Sumter Street - Campus Elevation
Partial height wall with metal fence to pier nad gate.

(267), Pendleton Street - Campus Elevation
Low wall with fence and pier. Multiple repointing issues. Vegetation issues.

(268), Pendleton Street - Campus Elevation
Low wall with fence. Multiple repointing issues. Vegetation issues.

(269), Pendleton Street - Campus Elevation
Low wall with fence and pier. Multiple repointing issues. Vegetation issues. Cap mortar issue.

(270), Pendleton Street - Campus Elevation
Low wall with fence. Multiple repointing issues. Vegetation issues. Cap mortar issue.

(271), Pendleton Street - Campus Elevation
Low wall with fence and pier. Multiple repointing issues. Vegetation issues. Cap mortar issue. Visible cracking.

(272), Pendleton Street - Campus Elevation
Low wall with fence. Multiple repointing issues. Vegetation issues. Cap mortar issue.

(273), Pendleton Street - Campus Elevation
Low wall with fence and pier. Multiple repointing issues. Vegetation issues. Cap mortar issue.

(274), Pendleton Street - Campus Elevation
Low wall with fence. Multiple repointing issues. Vegetation issues. Cap mortar issue.

(275), Pendleton Street - Campus Elevation
Low wall with fence and pier. Multiple repointing issues. Cap mortar issue.

(276), Pendleton Street - Campus Elevation
Low wall with fence. Multiple repointing issues. Cap mortar issue.

(277), Pendleton Street - Campus Elevation
Low wall with fence. Multiple repointing issues. Cap mortar issue.

(278), Pendleton Street - Campus Elevation
Low wall with fence. Multiple repointing issues. Cap mortar issue.

(279), Pendleton Street - Campus Elevation
Low wall with fence and pier. Multiple repointing issues. Cap mortar issue.

(280), Pendleton Street - Campus Elevation
Low wall with fence and pier. Multiple repointing issues. Cap mortar issue very serious.


(281), Pendleton Street - Campus Elevation
Double pier with gate. Repointing required.

(282), Pendleton Street - Campus Elevation
Partial height wall. Repointing required.

(283), Pendleton Street - Campus Elevation
Patial height wall to full height wall with pier. Repointing required. Vegetation issues.

(284), Pendleton Street - Campus Elevation
Full height wall with pier. Repointing required. Vegetation issues.


(285), Pendleton Street - Campus Elevation
Full height wall with pier. Repointing required. Vegetation issues. Multiple masonry connections.


(286), Pendleton Street - Campus Elevation
Full height wall with pier. Repointing required. Vegetation issues. Multiple mortars.

(287), Pendleton Street - Campus Elevation
Full height wall with pier. Repointing required. Vegetation issues. Multiple mortars.

(288), Pendleton Street - Campus Elevation
Full height wall with pier. Repointing required. Vegetation issues. Multiple mortars.

(289), Pendleton Street - Campus Elevation
Full height wall with pier. Repointing required. Vegetation issues. Multiple mortars.

(290), Pendleton Street - Campus Elevation
Full height wall with pier. Repointing required. Multiple mortars.

(291), Pendleton Street - Campus Elevation
Full height wall with pier. Repointing required. Multiple mortars.

(292), Pendleton Street - Campus Elevation
Full height wall with pier. Repointing required. Multiple mortars. Vertical cracking.

(293), Pendleton Street - Campus Elevation
Full height wall with pier. Repointing required. Multiple mortars. Tree too close to wall.

(294), Pendleton Street - Campus Elevation
Full height wall with pier. Repointing required. Multiple mortars. Cap work required.

(295), Pendleton Street - Campus Elevation
Full height wall to partial wall height. Repointing required. Multiple mortars.


(296), Pendleton Street - Campus Elevation
Partial wall height. Repointing required. Multiple mortars and missing brick.


(297), Pendleton Street - Campus Elevation
Partial wall height with pier. Repointing required. Multiple mortars.

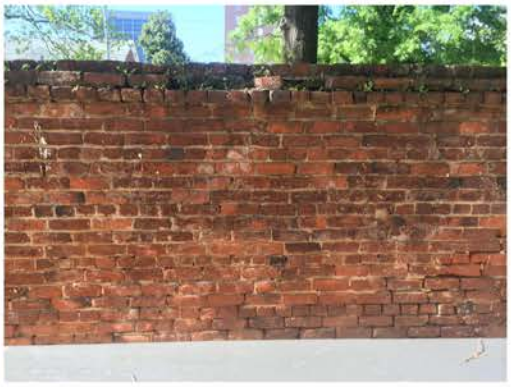
(298), Pendleton Street - Campus Elevation
Partial wall height with multiple piers. Repointing required. Multiple mortars.

(299), Pendleton Street - Campus Elevation
Partial wall height with piers. Repointing required. Multiple mortars.

(300), Pendleton Street - Campus Elevation
Partial wall height to full height wall. Repointing required. Multiple mortars.

(301), Pendleton Street - Campus Elevation
Full wall height with multiple structural issues. Repointing required. Multiple mortars.

(302), Pendleton Street - Campus Elevation
Full wall height with pier and multiple structural issues. Repointing required. Multiple mortars. Vegetation issues.



(303), Pendleton Street - Campus Elevation
Full wall height. Repointing required. Multiple mortars. Vegetation issues.

(304), Pendleton Street - Campus Elevation
Full wall height. Repointing required. Multiple mortars. Visible cracking.

(305), Pendleton Street - Campus Elevation
Full wall height. Repointing required. Multiple mortars.

(306), Pendleton Street - Campus Elevation
Full wall height. Repointing required. Multiple mortars.

(307), Pendleton Street - Campus Elevation
Full wall height with pier. Repointing required. Multiple mortars.

(308), Pendleton Street - Campus Elevation
Full wall height. Major repointing required. Multiple mortars.

(309), Pendleton Street - Campus Elevation
Full wall height with pier. Major repointing required. Multiple mortars.

(310), Pendleton Street - Campus Elevation
Full wall height. Major repointing required. Multiple mortars.

(311), Pendleton Street - Campus Elevation
Full wall height with pier. Major repointing required. Multiple mortars.

(312), Pendleton Street - Campus Elevation
Full wall height. Major repointing required. Multiple mortars.

(313), Pendleton Street - Campus Elevation
Full wall height with pier.  Major repointing required.  Multiple mortars.  Vegetation issues.

(314), Pendleton Street - Campus Elevation
Full wall height.  Major repointing required.  Multiple mortars.  Vertical cracking.

(315), Pendleton Street - Campus Elevation
Full wall height with pier.  Major repointing required.  Multiple mortars.

(316), Pendleton Street - Campus Elevation
Full wall height.  Major repointing required.  Multiple mortars.

(317), Pendleton Street - Campus Elevation
Full height wall curved .

(318), Pendleton Street - Campus Elevation
Full height wall - curved.

(319), Pendleton Street - Campus Elevation
Full height wall.

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of structure.

B. Related Requirements:

1. Division 01 Section "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Division 01 Section "Historic Treatment Procedures" for historic removal and dismantling.

1.3 DEFINITIONS

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

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

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

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

1.4 MATERIALS OWNERSHIP

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

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

## 1.5 PREDEMOLITION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

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

## 1.6 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

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

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.
5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

C. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

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

E. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

## 1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

## 1.8 FIELD CONDITIONS

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

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

C. Storage or sale of removed items or materials on-site is not permitted.

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

## PART 2 - PRODUCTS

### 2.1 PEFORMANCE REQUIREMENTS

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

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

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

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

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

D. When unanticipated 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. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

### 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems in the limits of work and protect them against damage.

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

1. Arrange to shut off indicated utilities with utility companies.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

## 3.3 PREPARATION

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

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

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

## 3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated.

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Remove decayed or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
4. Remove damaged existing masonry and lower to ground by method suitable to avoid free fall and to prevent ground impact, dust generation, or further damage to wall.
5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on existing wall.
6. Dispose of demolished items and materials promptly.

B. Work in Historic Areas: In historic spaces, areas, or on historic surfaces, the terms "demolish" or "remove" shall mean historic "removal" or "dismantling" as specified in Division 01 Section "Historic Treatment Procedures."

C. 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, cleaned, and reinstalled in their original locations after selective demolition operations are complete.

## 3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

## 3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Remove demolished materials from Project site and legally dispose of them.

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

B. Burning: Do not burn demolished materials.

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

## 3.7 CLEANING

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

END OF SECTION 024119

SECTION 040120 - MAINTENANCE OF UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. The University of South Carolina retained, under separate contract, the services of Dr. Dennis Brosnan, PhD, PE to assist in the analysis of the historic mortar and clay masonry bricks. It is the intent that the Historic Treatment Procedures consider and follow the recommendation of these reports. In the event of a discrepancy in these reports and the specifications, the Contractor shall notify the architect and submit a Request for Information.

1. Section 049998 "Characterization of Masonry Mortar."
2. Section 049999 "Engineering Assessment of Bricks. "

1.2 SUMMARY

A. Section includes maintenance of unit masonry consisting of brick clay masonry restoration and cleaning as follows:

1. Repairing unit masonry, including replacing units.
2. Repointing joints.
3. Preliminary cleaning, including removing plant growth.
4. Cleaning exposed unit masonry surfaces.

B. Owner-Furnished Material: Salvaged brick.

C. Related Sections:

1. Section 013591 "Historic Treatment Procedures."

1.3 CONTRACT SUM

A. The Base Bid Sum shall include the following set quantity for Replacement Brick Material. The Contractor in his Base Bid shall include the installation of this brick and the removal of unsuitable brick as called for in the documents:

1. Replacement Brick Brick Removal and Replacement:
   a. Twenty seven (27) thousand brick.

1.4 UNIT PRICES

A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."

1. Unit prices apply to authorized work covered by quantity allowances.
2. Unit prices apply to additions to and deletions from Work as authorized by Change Orders.

## 1.5 DEFINITIONS

A. Very Low-Pressure Spray: Under 100 psi.

B. Low-Pressure Spray: 100 to 400 psi; 4 to 6 gpm.

C. Medium-Pressure Spray: 400 to 800 psi; 4 to 6 gpm.

D. Saturation Coefficient: Ratio of the weight of water absorbed during immersion in cold water to weight absorbed during immersion in boiling water; used as an indication of resistance of masonry units to freezing and thawing.

## 1.6 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Owner has engaged a qualified testing agency to perform preconstruction testing on existing masonry units and mortars and is included in the Project Manual.

## 1.7 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.

B. Samples for Initial Selection: For the following:

1. Pointing Mortar: Submit sets of mortar for pointing in the form of sample mortar strips, 6 inches long by 1/2 inch wide, set in aluminum or plastic channels.

    a. Have each set contain a close color range of at least three Samples of different mixes of colored sands and cements that produce a mortar matching the cleaned masonry when cured and dry.
    b. Submit with precise measurements on ingredients, proportions, gradations, and sources of colored sands from which each Sample was made.

C. Samples for Verification: For the following:

1. Each type of masonry unit to be used for replacing existing units. Include sets of Samples as necessary to show the full range of shape, color, and texture to be expected.

    a. For each brick type, provide straps or panels containing at least four bricks. Include multiple straps for brick with a wide range.

2. Each type of sand used for pointing mortar; minimum 1 lb of each in plastic screw-top jars.

a. For blended sands, provide Samples of each component and blend.
b. Identify sources, both supplier and quarry, of each type of sand.

3. Each type, color, and texture of pointing mortar in the form of sample mortar strips, 6 inches long by 1/2 inch wide, set in aluminum or plastic channels.

   a. Include with each Sample a list of ingredients with proportions of each. Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any.

4. Each type of masonry patching compound in the form of briquettes, at least 3 inches long by 1-1/2 inches wide. Document each Sample with manufacturer and stock number or other information necessary to order additional material.

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data: For restoration specialists including field supervisors and restoration workers, chemical-cleaner manufacturer and testing service.

B. Test Reports: For replacement masonry units.

C. Quality-Control Program.

D. Restoration Program.

E. Cleaning Program.

1.9 QUALITY ASSURANCE

A. Restoration Specialist Qualifications: Engage an experienced masonry restoration and cleaning firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a minimum five (5) year record of successful in-service performance. Firm shall be prepared, upon demand, to list minimum of five (5) completed similar works with outlined scope of work and performance references. Experience installing standard unit masonry is not sufficient experience for masonry restoration work.

   1. At Contractor's option, work may be divided between two specialist firms: one for cleaning work and one for repair work.
   2. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisors on Project site during times that clay masonry restoration and cleaning work is in progress. Supervisors shall not be changed during Project except for causes beyond the control of restoration specialist firm.
   3. Restoration Worker Qualifications: Persons who are experienced and specialize in restoration work of types they will be performing.

B. Chemical-Cleaner Manufacturer Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with

factory-trained representatives who are available for consultation and Project-site inspection and assistance at no additional cost.

C. Source Limitations: Obtain each type of material for masonry restoration (face brick, cement, sand, etc.) from one source with resources to provide materials of consistent quality in appearance and physical properties.

D. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging masonry. Include provisions for supervising performance and preventing damage due to worker fatigue.

E. Restoration Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of restoration work including protection of surrounding materials and Project site.

1. Include methods for keeping pointing mortar damp during curing period.
2. If materials and methods other than those indicated are proposed for any phase of restoration work, add to the Quality-Control Program a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project and worker's ability to use such materials and methods properly.

F. Cleaning Program: Prepare a written cleaning program that describes cleaning process in detail, including materials, methods, and equipment to be used, protection of surrounding materials, and control of runoff during operations.

1. If materials and methods other than those indicated are proposed for any phase of restoration work, add to the Quality-Control Program a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project and worker's ability to use such materials and methods properly.

G. Cleaning and Repair Appearance Standard: Cleaned and repaired surfaces are to have a uniform appearance as viewed from 20 feet away by Architect. Perform additional paint and stain removal, general cleaning, and spot cleaning of small areas that are noticeably different, so that surface blends smoothly into surrounding areas.

H. Mockups: Prepare mockups of restoration and cleaning to demonstrate aesthetic effects and set quality standards for materials and execution and for fabrication and installation.

1. Mortar Color: Prepare sample wall using replacement brick and proposed mortar prior to construction of any other sample mockups.

2. Concealed section of existing wall, in location suitable to Architect and Owner, may be used for repair and repointing demonstration noted below.

3. Masonry Repair: Prepare sample areas for each type of masonry material indicated to have repair work performed. If not otherwise indicated, size each mockup not smaller than 2 adjacent whole units or approximately 48 inches in least dimension. Erect sample

areas in existing walls unless otherwise indicated, to demonstrate quality of materials, workmanship, and blending with existing work. Include the following as a minimum:

a. Replacement:
   1) Four brick units replaced.
b. Widening Joints: Widen a joint in 2 separate locations**,** each approximately 12 inches long.

4. Repointing: Rake out joints in 2 separate areas**,** each approximately 36 inches high by 48 inches wide for each type of repointing required and repoint one of the areas.

5. Cleaning: Clean an area approximately 25 sq. ft. for each type of masonry and surface condition.

   a. Test cleaners and methods on samples of adjacent materials for possible adverse reactions. Do not use cleaners and methods known to have deleterious effect.
   b. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.

6. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

7. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

I. Preinstallation Conference: Conduct conference at Project site**.**

1. Review methods and procedures related to masonry restoration and cleaning including, but not limited to, the following:

   a. Construction schedule. Verify availability of materials, Restoration Specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
   b. Materials, material application, sequencing, tolerances, and required clearances.

## 1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry units to Project site strapped together in suitable packs or pallets or in heavy-duty cartons.

B. Deliver other materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

D. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.

E. Store lime putty covered with water in sealed containers.

F. Store sand where grading and other required characteristics can be maintained and contamination avoided.

## 1.11 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry restoration and cleaning work to be performed according to manufacturers' written instructions and specified requirements.

B. Repair masonry units and repoint mortar joints only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least 7 days after completion of the Work unless otherwise indicated.

C. Cold-Weather Requirements: Comply with the following procedures for masonry repair and mortar-joint pointing unless otherwise indicated:

1. When air temperature is below 40 deg F, heat mortar ingredients, masonry repair materials, and existing masonry walls to produce temperatures between 40 and 120 deg F.
2. When mean daily air temperature is below 40 deg F, provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for 7 days after repair and pointing.

D. Hot-Weather Requirements: Protect masonry repair and mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F and above unless otherwise indicated.

E. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.

F. Clean masonry surfaces only when air temperature is 40 deg F and above and is predicted to remain so for at least 7 days after completion of cleaning.

## 1.12 COORDINATION

A. Coordinate masonry restoration and cleaning with public circulation patterns at Project site. Some work is near public circulation patterns of roads and walking paths. Public circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work. Plan and execute the Work accordingly.

## 1.13 SEQUENCING AND SCHEDULING

A. Order replacement materials at earliest possible date to avoid delaying completion of the Work.

B. Order sand for pointing mortar immediately after approval of mockups. Take delivery of and store at Project site a sufficient quantity to complete Project.

C. Perform masonry restoration work in the following sequence:

1. Remove plant growth.
2. Inspect for open mortar joints and repair before cleaning to prevent the intrusion of water and other cleaning materials into the wall.
3. Remove paint.
4. Clean masonry surfaces.
5. Where water repellents, specified in Section 071900 "Water Repellents," are to be used on or near masonry work, delay application of these chemicals until after pointing.
6. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
7. Repair masonry, including replacing existing masonry with new masonry materials.
8. Rake out mortar from joints to be repointed.
9. Point mortar and sealant joints.
10. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.
11. Final cleaning shall consist of light to medium pressure spray with clean water and brush.

D. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry units to comply with "Masonry Unit Patching" Article. Patch holes in mortar joints to comply with "Repointing Masonry" Article.

## PART 2 - PRODUCTS

### 2.1 MASONRY MATERIALS

A. Face Brick: Provide specially hand molded units to complete masonry restoration work.

1. Provide units with colors, color variation within units, surface texture, size, and shape to match existing brickwork and with physical properties within 10 percent of those determined from preconstruction testing of selected existing units.

    a. For existing brickwork that exhibits a range of colors or color variation within units, provide brick that proportionally matches that range and variation rather than brick that matches an individual color within that range.

2. Provide units with colors, color variation within units, surface texture, and physical properties to match existing units in size and shape.

    a. For existing sample that exhibits a range of colors or color variation within units, provide brick that proportionally matches that range rather than brick that matches an individual color within that range.

3. Date Identification: Emboss in the clay body on an interior surface of each unit in easily read 1/2-inch- high characters, "MADE 2014." Manufacturer's name may also be embossed.

4. Basis of Design: Subject to compliance with requirements, provide the following brick, complying with ASTM C 62, or Architect approved comparable product determined by testing of existing brick.

    a. Old Carolina Brick Company Hand Made Units
        1) Color: Range as determined from those existing and identified by Owner and Supplier, and mutually agreed upon, during pre-construction.
        2) Size: Approximately 8 inches by 4 inches, by 2 3/4 inches. To be field verified during pre-construction.
        3) Grade SW
        4) Grade SW, for concealed backup.
        5) Date Identification: Emboss in the clay body on an interior surface of each unit in easily read 1/2-inch- high characters, "MADE 2014."

## 2.2 MORTAR MATERIALS

A. Natural Cement:

1. Basis of Design: Subject to compliance with requirements, provide the following mortar or Architect approved comparable product determined by testing of existing mortar.

    a. Premixed Mortar by Virginia Limeworks – as outlined in attached Mortar Analysis Memo.

B. Hydrated Lime: ASTM C 207, Type S.

C. Factory-Prepared Lime Putty: ASTM C 1489.

D. Quicklime: ASTM C 5, pulverized lime.

E. Mortar Sand: ASTM C 144 unless otherwise indicated.

1. Color: Provide natural sand of color necessary to produce required mortar color.
2. For pointing mortar, provide sand with rounded edges.
3. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.

F. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.

G. Water: Potable.

## 2.3 PAINT REMOVERS

A. Low-Odor, Solvent-Type Paint Remover: Manufacturer's standard low-odor, water-rinsable solvent-type gel formulation, containing no methanol or methylene chloride, for removing paint coatings from masonry.

1. Basis of Design: Subject to compliance with requirements, provide the following paint remover or Architect approved comparable product determined.

a. PROSOCO: Enviro Klean Safety Peel 1.

## 2.4 CLEANING MATERIALS

A. Water: Potable.

B. Hot Water: Water heated to a temperature of 140 to 160 deg F.

C. Job-Mixed Detergent Solution: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 1/2 cup of laundry detergent, and 20 quarts of hot water for every 5 gal. of solution required.

D. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 5 quarts of 5 percent sodium hypochlorite (bleach), and 15 quarts of hot water for every 5 gal. of solution required.

E. Acidic Cleaner: Manufacturer's standard acidic masonry cleaner composed of hydrofluoric acid or ammonium bifluoride blended with other acids, detergents, wetting agents, and inhibitors.

1. Basis of Design: Subject to compliance with requirements, provide the following acidic cleaner or Architect approved comparable product. Strictly follow manufacturers pre-wetting requirements of manufacturer to prevent efflorescence.

a. PROSOCO: ReVive

F. Carbon and Pollution cleaner: Manufacturer's standard carbon and pollution cleaner.

1. Basis of Design: Subject to compliance with requirements, provide the following cleaner or Architect approved comparable product.

a. PROSOCO: Restoration Cleaner

## 2.5 ACCESSORY MATERIALS

A. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, and polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. PROSOCO: Sure Klean Strippable Masking

B. Setting Buttons: Resilient plastic buttons, nonstaining to masonry, sized to suit joint thicknesses and bed depths of masonry units without intruding into required depths of pointing materials.

C. Masking Tape: Nonstaining, nonabsorbent material, compatible with pointing mortar, joint primers, sealants, and surfaces adjacent to joints; that will easily come off entirely, including adhesive.

D. Miscellaneous Products: Select materials and methods of use based on the following, subject to approval of a mockup:

1. Previous effectiveness in performing the work involved.
2. Little possibility of damaging exposed surfaces.
3. Consistency of each application.
4. Uniformity of the resulting overall appearance.
5. Do not use products or tools that could do the following:

    a. Remove, alter, or in any way harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in contract.
    b. Leave a residue on surfaces.

## 2.6 MORTAR MIXES

A. Preparing Lime Putty: Slake quicklime and prepare lime putty according to appendix to ASTM C 5 and manufacturer's written instructions.

B. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.

C. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.

1. Mortar Pigments: Where mortar pigments are indicated, do not exceed a pigment-to-cement ratio of 1:10 by weight.

D. Do not use admixtures in mortar unless otherwise indicated.

## 2.7 CHEMICAL CLEANING SOLUTIONS

A. Dilute chemical cleaners with water to produce solutions not exceeding concentration recommended by chemical-cleaner manufacturer.

B. Acidic Cleaner Solution for Brick**.** Dilute with water to produce hydrofluoric acid content of 3 percent or less, but not greater than that recommended by chemical-cleaner manufacturer.

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.

1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.

B. Comply with chemical-cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical-cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
2. Keep wall wet below area being cleaned to prevent streaking from runoff.
3. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
4. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.
5. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

C. Prevent mortar from staining face of surrounding masonry and other surfaces.

1. Cover sills, ledges, and projections to protect from mortar droppings.
2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
3. Immediately remove mortar in contact with exposed masonry and other surfaces.
4. Clean mortar splatters from scaffolding at end of each day. Retain paragraph below if applicable.

3.2 BRICK REMOVAL AND REPLACEMENT

A. At locations indicated, remove bricks that are damaged, spalled, or deteriorated shall be removed and replaced. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.

1. When removing single bricks, remove material from center of brick and work toward outside edges.

B. Support and protect remaining masonry that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

C. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

D. Remove in an undamaged condition as many whole bricks as possible.

1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
2. Remove sealants by cutting close to brick with utility knife and cleaning with solvents.
3. Store brick for reuse. Store off ground, on skids, and protected from weather.
4. Deliver cleaned brick not required for reuse to Owner unless otherwise indicated.

E. Clean bricks surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.

F. Replace removed damaged brick with new brick matching existing brick, including size. Do not use broken units unless they can be cut to usable size.

G. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

1. Maintain joint width for replacement units to match existing joints.
2. Use setting buttons or shims to set units accurately spaced with uniform joints.

H. Lay replacement brick with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min.. Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.

1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
2. Rake out mortar used for laying brick before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing masonry, and at same time as repointing of surrounding area.
3. When mortar is sufficiently hard to support units, remove shims and other devices interfering with pointing of joints.

## 3.3 WIDENING JOINTS

A. Do not widen a joint, except where indicated or approved by Architect.

B. Location Guideline: Where an existing masonry unit abuts another or the joint is less than 1/8 inch widen the joint for length indicated and to depth required for repointing after obtaining Architect's approval.

C. Carefully perform widening by cutting, grinding, routing, or filing procedures demonstrated in an approved mockup.

D. Widen joint to width equal to or less than predominant width of other joints on building. Make sides of widened joint uniform and parallel. Ensure that edges of units along widened joint are in alignment with joint edges at unaltered joints.

## 3.4 CLEANING MASONRY, GENERAL

A. Proceed with cleaning in an orderly manner; work from bottom to top of each scaffold width and from one end of each elevation to the other. Ensure that dirty residues and rinse water will not wash over cleaned, dry surfaces.

B. Use only those cleaning methods indicated for each masonry material and location.

1. Do not use wire brushes or brushes that are not resistant to chemical cleaner being used. Do not use plastic-bristle brushes if natural-fiber brushes will resist chemical cleaner being used.
2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage masonry.

    a. Equip units with pressure gages.

3. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray tip.
4. For water-spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
5. For high-pressure water-spray application, use fan-shaped spray tip that disperses water at an angle of at least 40 degrees.
6. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F at flow rates indicated.
7. For steam application, use steam generator capable of delivering live steam at nozzle.

C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.

D. Water Application Methods:

1. Water-Soak Application: Soak masonry surfaces by applying water continuously and uniformly to limited area for time indicated. Apply water at low pressures and low volumes in multiple fine sprays using perforated hoses or multiple spray nozzles. Erect a protective enclosure constructed of polyethylene sheeting to cover area being sprayed.
2. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches from surface of masonry and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

E. Steam Cleaning: Apply steam to masonry surfaces at the very low pressures indicated for each type of masonry material. Hold nozzle at least 6 inches from surface of masonry and apply steam in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

F. Chemical-Cleaner Application Methods: Apply chemical cleaners to masonry surfaces to comply with chemical-cleaner manufacturer's written instructions; use brush or spray application. Do not spray apply at pressures exceeding 50 psi. Do not allow chemicals to remain on surface for periods longer than those indicated or recommended by manufacturer.

G. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.

1. Apply neutralizing agent and repeat rinse if necessary to produce tested pH of between 6.7 and 7.5.

H. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.

## 3.5 PRELIMINARY CLEANING

A. Removing Plant Growth: Owner shall pre-treat plant growth with herbicide to expedite removal process. Contractor shall completely remove visible plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing to dry as long as possible before removal. Remove loose soil and debris from open masonry joints to whatever depth they occur.

B. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to cleaning methods being used. Extraneous substances include paint, calking, asphalt, and tar.

1. Carefully remove heavy accumulations of material from surface of masonry with a sharp chisel. Do not scratch or chip masonry surface.
2. Remove paint and calking with alkaline paint remover.

    a. Comply with requirements in "Paint Removal" Article.
    b. Repeat application up to two times if needed.

3. Remove asphalt and tar with solvent-type paint remover.

    a. Comply with requirements in "Paint Removal" Article.
    b. Apply paint remover only to asphalt and tar by brush without prewetting.
    c. Allow paint remover to remain on surface for 10 to 30 minutes.
    d. Repeat application if needed.

## 3.6 PAINT REMOVAL

A. Paint Removal with Alkaline Paste Paint Remover:

1. Remove loose and peeling paint using low-pressure spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
2. Apply paint remover to dry, painted masonry with brushes.
3. Allow paint remover to remain on surface for period recommended by manufacturer.

4. Rinse with cold or hot water applied by manufacturer's recommended pressure spray to remove chemicals and paint residue.
5. Repeat process if necessary to remove all paint.
6. Apply acidic cleaner or manufacturer's recommended afterwash to masonry, while surface is still wet, using low-pressure spray equipment or soft-fiber brush. Let cleaner or afterwash remain on surface as a neutralizing agent for period recommended by chemical cleaner or afterwash manufacturer.
7. Rinse with cold water applied by low pressure spray to remove chemicals and soil.

B. Paint Removal with Covered or Skin-Forming Alkaline Paint Remover:

1. Remove loose and peeling paint using low-pressure spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
2. Apply paint remover to dry, painted masonry with trowel, spatula, or as recommended by manufacturer.
3. Apply cover, if required by manufacturer, per manufacturer's written instructions.
4. Allow paint remover to remain on surface for period recommended by manufacturer or as determined in test panels.
5. Scrape off paint and remover and collect for disposal.
6. Rinse with cold or hot water applied by low pressure spray to remove chemicals and paint residue.
7. Use alkaline paste paint remover, according to "Paint Removal with Alkaline Paste Paint Remover" Paragraph, if necessary to remove remaining paint.
8. Apply acidic cleaner or manufacturer's recommended afterwash to masonry, while surface is still wet, using low-pressure spray equipment or soft-fiber brush. Let cleaner or afterwash remain on surface as a neutralizing agent for period recommended by chemical-cleaner or afterwash manufacturer.
9. Rinse with cold water applied by low-pressure spray to remove chemicals and soil.

C. Paint Removal with Solvent-Type Paint Remover:

1. Remove loose and peeling paint using low-pressure spray, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
2. Apply thick coating of paint remover to painted masonry with natural-fiber cleaning brush, deep-nap roller, or large paint brush.
3. Allow paint remover to remain on surface for period recommended by manufacturer.
4. Rinse with cold or hot water applied by low-pressure spray to remove chemicals and paint residue.

## 3.7 CLEANING BRICKWORK

A. Cold-Water Soak:

1. Apply cold water by intermittent spraying to keep surface moist.
2. Use perforated hoses or other means that will apply a fine water mist to entire surface being cleaned.
3. Apply water in cycles with at least 30 minutes between cycles.
4. Continue spraying until surface encrustation has softened sufficiently to permit its removal by water wash, as indicated by cleaning tests.
5. Continue spraying for 72 hours.

6. Remove soil and softened surface encrustation from masonry with cold water applied by low-pressure spray.

B. Cold-Water Wash: Use cold water applied by low-pressure spray.

C. Hot-Water Wash: Use hot water applied by low-pressure spray.

D. Mold, Mildew, and Algae Removal:

1. Apply mold, mildew, and algae remover by brush or low-pressure spray.
2. Scrub masonry with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that masonry surface remains wet.
3. Rinse with **cold** or **hot** water applied by low pressure spray to remove mold, mildew, and algae remover and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

E. Mild Acidic Chemical Cleaning:

1. Wet masonry with cold water applied by low-pressure spray.
2. Apply cleaner to masonry in two applications by brush or low-pressure spray. Let cleaner remain on surface for period indicated below:

    a. As recommended by chemical-cleaner manufacturer.
    b. As established by mockup.
    c. Two to three minutes.

3. Rinse with cold water applied by low-pressure spray to remove chemicals and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use a steam cleaning.

## 3.8 REPOINTING MASONRY

A. Rake out and repoint joints to the following extent:

1. All joints in the limits of Work indicated.
2. Joints where they have been filled with portland cement or materials other than mortar.

B. Rake out joints as follows, according to procedures demonstrated in approved mockup:

1. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
2. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Architect.

a. Cut out mortar by hand with chisel and resilient mallet. Do not use power-operated grinders without Architect's written approval based on approved quality-control program.
b. Cut out center of mortar bed joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar by hand with chisel and resilient mallet. Strictly adhere to approved quality-control program.

C. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.

D. Pointing with Mortar:

1. Rinse joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch until a uniform depth is formed. Fully compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
3. After low areas have been filled to same depth as remaining joints, point all joints by placing mortar in layers not greater than 3/8 inch. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry units have worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar beyond joint edges onto exposed masonry surfaces or to featheredge the mortar.
4. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
5. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours including weekends and holidays.

    a. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.
    b. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.

6. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

E. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

## 3.9 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure.

1. Do not use metal scrapers or brushes.

2. Do not use acidic or alkaline cleaners.

B. Wash adjacent woodwork and other non-masonry surfaces. Use detergent and soft brushes or cloths.

C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

D. Sweep and rake adjacent pavement and grounds to remove mortar and debris. Where necessary, pressure wash pavement surfaces to remove mortar, dust, dirt, and stains.

## 3.10 FIELD QUALITY CONTROL

A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare test reports. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.

B. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.

C. Notify Architect's Project representatives in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until Architect's Project representative have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location.

END OF SECTION 040120

# Characterization of Masonry Mortar
# Historic Campus Wall
# University of South Carolina

by
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July 2, 2014

## Executive Summary

Specimens of mortar from the Historic Wall completed in 1836 were characterized as to their chemical and mineralogical composition and for selected physical properties. The purpose was development of information for use in specifications for repair material and to guide restoration activities. Continuing advice and construction monitoring in future restorations are to be provided to the Architectural/Engineering team as restoration progresses.

The brick masonry wall was built before the era of Portland cement production but during a time when lime, hydraulic lime, and "Roman cement" binders were available for use with aggregate (sand) to produce masonry mortars. It is important that repair mortars are compatible with those used in original constructions to ensure the repairs do no harm to the historic materials. To this end, the mortars on the wall were subjected to analytical tests and microscopic examinations.

The mortar binders were found to be similar to contemporary natural (pozzolanic) hydraulic lime with a hydraulic lime to sand volumetric ratio varying between 1:2 and 1:3. The binder was a unique mixture of clay and magnesian lime manufactured to exhibit mineral constituents called pozzolans that impart greater chemical durability to hardened mortars than those composed of only lime binders. Bricks were not examined as a part of characterization activities, as the bricks on the Wall are generally in excellent structural condition for continued service.

Mortar deterioration was observed at the top of the wall in coping courses, near and below ground level in vertical sections. In coping courses, organic acids from vegetation and rain exposure led to partial removal of the carbonate binder and weakening of the mortar. Near and below ground level, dissolved salt in ground water and rising damp facilitated partial removal of the carbonate binder. The results on a microscopic scale are altered mineralogy and increases in porosity/air content.

Restoration of historic masonry is conducted in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties which addresses use of compatible materials, use of materials authentic to the structure, and repairs conducted in compliance with the aesthetics of the structure. Use of natural hydraulic lime mortar meeting ASTM Standard C1707 is recommended for restoration of the Wall. These mortars are available or can be produced in both bedding and pointing formulations with colorants added to ensure acceptable aesthetics. Care is advised in consulting with the supplier and/or pre-testing candidate mortars in small field panels prior to repairs to evaluate efflorescence potential and ensure no unexpected costs for masonry cleaning.

Introduction

The Historic Wall surrounding the Horseshoe at the University of South Carolina Campus was inspected and four specimens of mortar were obtained for characterization on March 13, 2014. For purposes of this report, the inspection was to determine the condition of the wall and to observe any mechanisms of material degradation. General findings on masonry materials were as follows:

- The bricks in original construction were in good structural or sound condition exhibiting only infrequent damage from freezing and thawing or salt exposure. Some bricks were missing in areas of the coping courses, and others were damaged in areas of wall impacts or physical alterations of the wall.

- Many bricks were loose in coping courses where mortar and bricks were discolored by organic matter from overhanging tree growth. Biological growth in mortar joints attested to the wet conditions in the upper courses of the wall. The mortar was solid or not in a powdered condition in upper courses in the wall.

- Mortar recession was observed in lower courses, generally to 24" above ground level, suggesting mortar interaction with salt-laden water in rising damp. The source of salts is the naturally occurring salt in the soil plus environmental sources.

- Mortar was generally in a soft condition below ground level for a distance of 1-2" behind the masonry wall surface; i.e. the mortar was easily removed using a steel tool.

The mortar specimens are identified as follows:

"Greene 1", from the upper interior wall (campus side) on Greene Street by Health Sciences near the corner of Sumter and Greene Streets.

"Greene 2", from below ground on the interior side from a small excavation about 6 courses below ground level, near the corner of Sumter and Greene Streets.

"Sumter 1", from the upper interior wall adjacent to the Caroliniana near the coping courses.

"Sumter 2", from the lower interior wall above ground level but in the area of visible rising damp area of mortar recession, adjacent to the Caroliniana (not from within the small excavation at this location).

The mortar specimens were characterized as to their composition and physical properties in order to develop specifications for repair and restoration. The development of information on the mortar follows dictates the *Secretary of the Interior's Standards for the Treatment of Historic Properties*[1] where attention is prescribed toward use of authentic materials that meet the aesthetics of the historic construction while "doing no harm" to the historic "fabric". In practical terms, this means as masonry mortar used in repair or restoration should (1) exhibit a water vapor permeability

[1] See http://www.nps.gov/history/hps/tps/standguide/

equal to that of the original mortar (so as to avoid moisture accumulation in wall elements) and (2) reasonably match the "stiffness" or modulus of elasticity of the original mortar. It is well known, for example, that stiff repair or repointing mortar based on Portland cement can cause spalling or facial loss from a historic wall due to mismatch of modulus of elasticity with "soft" historic bricks. To meet aesthetic requirements of the Secretary's Standards, repair mortars containing colorants are typically chosen.

The examination of hardened masonry mortar follows methods in ASTM Standards[2]. Because the Historic Wall was completed in 1836, it was known that modern Portland cement binder was unavailable. The possible binders were for masonry mortar were hydraulic lime (as calcium hydroxide), pozzolanic hydraulic lime, and "Roman cement", the latter a material in limited availability especially due to shipment difficulties to Columbia. The remaining potential binders, hydraulic lime and pozzolanic hydraulic lime, dictated special analytical procedures for identification.

For explanation, hydraulic lime as calcium hydroxide, is combined with sand and water to produce masonry mortar that slowly attains a "set" condition by chemical reaction with atmospheric carbon dioxide" in a process called re-carbonation. Pozzolanic hydraulic lime has mineral constituents in addition to calcium hydroxide forming more corrosion resistant substances within masonry mortar than those formed in non-pozzolanic compositions[3]. Pozzolanic hydraulic lime has been known since Roman times, and it is currently sold under ASTM Standards[4]. As a historical note, mortar in Roman constructions in Western Europe, circa AD200, contained pozzolanic hydraulic lime created by mechanical mixtures of hydraulic lime and clay brick dust, as pozzolanic mortar from Italy was not available for construction in Western Europe.

The techniques used in characterization of the mortars are well-known and reported in a number of references[5]. These techniques include X-ray fluorescence spectroscopy or "XRF" for chemical analysis, X-ray diffraction analysis or "XRD" for mineralogy, simultaneous thermal analysis or "STA" to detect carbonate content and presence of trace minerals, water soluble salt determination by ion chromatography or "IC", and density and porosity (air content) of mortar by mercury intrusion porosimetry or "MIP". In addition, mortar was examined by light microscopy or "petrography" and by scanning electron microscopy or "SEM". This report is divided into a non-technical section in the body of the report with detailed information in the Appendix, the latter for the historical record and intended as a resource for researchers and students.

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[2] ASTM C1324 - 10 Standard Test Method for Examination and Analysis of Hardened Masonry Mortar. The American Society for Testing and Materials.

[3] Pozzolanic hydraulic limes are commonly known as "natural hydraulic lime" or "NHL" if produced from argillaceous limestone (without pozzolanic additives).

[4] ASTM C1707 – 11, Standard Specification for Pozzolanic Hydraulic Lime for Structural Purposes.

[5] Brosnan, Denis A., Sanders, John P. and Hart, Stephanie A., "Application of Thermal Analysis in Preservation and Restoration of Historic Masonry Materials, Part A: Characterization of Materials," Journal of Thermal Analysis and Calorimetry (2011) 106:109-115.

Findings

## Mortar Batch Proportions

The mortars were found to be comprised of quartz (sand) and calcite (calcium carbonate) by XRD. The quantitative XRD was used to establish the sand content of the mortars while, following usual lab practice, the STA (thermal analysis) data was used to quantify the hydrated lime content[6]. The results of the calculations using the weight to volume conversion methods in ASTM 1324 are given in Table 1.

Table 1: Volumetric Proportions of Mortars

| Constituents by Volume | Greene 1 | Greene 2 | Sumter 1 | Sumter 2 |
|---|---|---|---|---|
| Location | Upper Wall | Below Ground | Upper Wall | Lower Wall |
| Parts Sand | 2.12 | 6.40 | 2.53 | 4.04 |
| Parts Hydraulic Lime | 1 | 1* | 1 | 1* |

* The result reflects carbonate solution in ground water or rising damp.

As will be discussed below, the relative contents of sand and lime in Greene 2 and Sumter 2 are a result of carbonate removal by salt attack and are therefore not representative of original construction. By contrast, the specimens Greene 1 and Sumter 1 did not experience substantive salt corrosion and they reflect original batch proportions. Because of the small specimen sizes and job site variations during original construction, the actual batch proportions in original mortar are predicted as two to three parts of sand to one part of hydraulic lime.

## Binder Identification

The binder or cementitious material in each mortar was found by SEM to be a pozzolanic hydraulic lime composed of a mechanical mixture of hydraulic lime and clay that was blended with sand at the job site by masons. A contemporary blended hydraulic lime is called an *artificial* hydraulic lime. Relics of the clay[7] in the USC mortar exhibit an analysis of $Al_2O_3$ of 17.65% and $SiO_2$ of 62.71% or $Al_2O_3$/ $SiO_2$ of 0.28 in general agreement with t values of weathered shale used as brick making clays in the Columbia area[8]. The hydraulic lime phase[9] exhibits CaO of 75.80%, MgO of 3.66%, and $SiO_2$ of 17.86%. The clay to lime ratio varied in the mortar specimens with

[6] The STA data is preferred as it can differentiate carbonate phases in binder from those that may be present in sands when considered with petrographic information.
[7] Spectrum 35.
[8] Personal communication, David McKeown (Hanson Brick) to Denis Brosnan. June 17, 2014. The weathered shale used by Hanson Brick, as-mined, exhibited the following analyses: 15.45-16.86% $Al_2O_3$, 64.35-65.07% $SiO_2$, and 0.23-0.26 $Al_2O_3/SiO_2$. The shale also contained 1.40-2.99% MgO as mined.
[9] Spectrum 37.

specimen "Sumter 2" exhibiting the highest clay content. This just means that masons used "inexact" practices with mortar batches resulting in variations in the actual composition.

The overall composition of the binder in the upper wall specimens is compared to contemporary pozzolanic hydraulic lime in Table 2. While the comparisons do not yield exact matches (per expectations), the similarity of the analyses implies that the Columbia masons were using a formula of clay and lime intended to produce a pozzolanic hydraulic lime.

Table 2: Comparison of Binders by Chemical Analysis (Weight %)

| | Greene 1 | Sumter 1 | NHL 3.5 | NHL 5.0 |
|---|---|---|---|---|
| Source | Spectrum 8 SEM, Greene 1 | Spectrum 30 SEM. Sumter 1 | Va. Lime Works NBRC Lab Report 2/22/10 | Va. Lime Works NBRC Lab Report 2/22/10 |
| CaO | 73.89 | 68.49 | 67.19 | 66.96 |
| $Al_2O_3$ | 3.12 | 2.05 | 4.88 | 4.54 |
| $SiO_2$ | 13.22 | 26.01 | 21.04 | 21.17 |
| MgO | 7.86 | 2.52 | 2.19 | 2.64 |
| $Fe_2O_3$ | 0.88 | 0.93 | 1.51 | 1.54 |
| S | 0.62 | ND | 1.30 | 1.38 |
| Cl | 0.41 | ND | 0.13 | 0.11 |

ND = not detected. NHL specimens tested were from Virginia Lime Works.

The designations NHL 3.5 and NHL 5.0 refer to a minimum compressive strength development of either 3.5 MPa (508 psi) or 5.0 MPa (725 psi) in a mortar mix after 28 days of curing (per BS EN 459-1). Type NHL 3.5 is typically recommended for construction near or below ground level. A type 2.0 is available but not recommended for near ground level. Types NHL 2.0, 3.5, and 5.0 are called weekly, moderately, and eminently hydraulic lime respectfully.

In summary, the binder in all of the USC mortar specimens is an artificial mixture of lime and clay (with sand) producing a pozzolanic hydraulic lime. Since artificial pozzolanic mortars have been known since Roman times, the masons building the wall were aware of the technology of their era and trying to construct a durable wall to last many years.

## Deterioration of Mortar in the Wall

Data relative to the carbonate content of the mortars is shown in Table 3. Loss on ignition measures total weight loss between room temperature and 1000$^{o}$C to include the decomposition of calcium carbonate and any other minerals that decompose as well. The STA data presented is for decomposition only in the interval of carbonate decomposition in the interval 600-800$^{o}$C.

This data shows a reduction in carbonate content of about 35-50% in the specimens from the outer periphery of the mortar. The removal of carbonate binder was also seen by microscopic methods. The process has been described in the literature by Labelli, et. al[10].

Table 3: Data Illustrating Weight Loss and Carbonate Levels in Mortars*

| | Greene 1 | Greene 2 | Sumter 1 | Sumter 2 |
|---|---|---|---|---|
| Location | Upper Wall | Below Ground (% of upper wall) | Upper Wall | Lower Wall (% of upper wall) |
| Total Weight Loss after 1000ºC (LOI), % | 13.58 | 7.32 (53.9% of Greene 1) | 12.89 | 8.46 (65.5% Of Sumter 1) |
| Weight loss, 20-250ºC (organic matter), STA, % | 1.03 | 0.58 | 0.72 | 1.89 |
| Calculated Carbonate content from STA. % as $CaCO_3$ | 20.5 | 10.7 (52.2% of Greene 1) | 17.9 | 10.6 (59.2% of Sumter 1) |

* The carbonate and organic matter both contribute to the total weight loss or LOI.

The data is not specific to the mortar in coping courses on the wall. In that location, organic acids from decay of tree vegetation is responsible for mortar attack. This is supported by the relatively high weight losses on carbon oxidation when comparing specimens Greene 1 and Greene 2; however, other organics, as possible plant growth, were apparently present in Sumter 2 rendering the comparison with Sumter 1 as indecisive.

Further data supporting carbonate removal is shown in Table 4 where the content of water soluble salts extracted at room temperature is reported (by IC). The values are expressed in parts per million of the dry specimen weight (i.e. mg/kg). It is difficult to correlate salt content with position; however, all mortar specimens exhibit water soluble species.

Table 4: Soluble Salts in Mortar Specimens, ppm.

| | Greene 1 | Greene 2 | Sumter 1 | Sumter 2 |
|---|---|---|---|---|
| Location | Upper Wall | Below Ground | Upper Wall | Lower Wall |
| Calcium | 6358 | 953 | 886 | 7894 |
| Magnesium | 92.9 | 286 | 230 | 31.1 |
| Chloride | 1535 | 20.6 | 12.4 | 98.6 |
| Sulfate | 4858 | 53.7 | 45.8 | 1295 |

[10] B. Lubelli, R. van Hees, and C. Groot, The role of sea salts in the occurrence of different damage mechanisms and decay patterns in brick masonry, Construction and Building Materials 18 (2004) 119-124

It is not surprising that carbonate reduction is seen in areas of rising damp or below ground, as this is a very common occurrence in historic mortars. Pozzolanic substances retard such corrosion in mortars, but they do not prevent all carbonate loss. This is why periodic re-pointing is necessary for masonry walls.

## Physical Data on Wall Mortars

Physical tests by MIP revealed the density and porosity (air content) of the mortars (Table 5). The values for density and porosity are as expected for hardened mortar except for the values in Sumter 2. The low porosity and high fraction of pores <1 micron in diameter are possibly related to the very high clay content of the binder phase in this specimen.

Table 5: Density and Porosity Data by MIP for Mortars

| | Greene 1 | Greene 2 | Sumter 1 | Sumter 2 |
|---|---|---|---|---|
| Location | Upper Wall | Below Ground | Upper Wall | Lower Wall |
| Bulk density, $g/cm^3$ | 1.85 | 1.72 | 1.71 | 1.93 |
| Apparent porosity, volume % | 27.08 | 33.01 | 30.39 | 20.10 |
| Fraction of pores <1μ in diameter | 17.24 | 28.80 | 32.57 | 57.24 |

Recommendation on Repair and Replacement Mortar

Mortar based on pozzolanic hydraulic lime meeting ASTM C1707 – 11, *Standard Specification for Pozzolanic Hydraulic Lime for Structural Purposes*, meets all of the Secretary of the Interior's requirements to include authenticity and aesthetics, providing that the mortar is color matched. It should meet specifications for NHL 3.5 in BS EN 459-1, and it should be formulated in sand contents appropriate for either re-pointing or bedding mortar. The choice of NHL 3.5 will approximately match the vapor permeance and stiffness of the original mortar.

Recommendation on Repair Bricks

Repair bricks should be hand molded, size matched, and color matched to those in the Wall, and meet ASTM C216, Grade SW. rated "not effloresced". The bricks should have loosely adherent sand that can be removed as necessary at the job site. Used bricks are not recommended because of their unknown durability per recommendations in the Technical Notes of the Brick Industry Association.

## Additional Considerations in Wall Restoration

### Evaluation of Efflorescence

Field panels of a size 4 feet by four feet by one course thickness could be constructed behind the existing walls over a solid base using any candidate restoration mortars and exposed to weather for at least 60 days to evaluate efflorescence potential of the mortar. If the solid base is concrete, the field panel should be constructed over flashing to prevent upward movement of calcium into the panel. Removal of efflorescence may involve considerable cost to a restoration project given the need to protect original materials from chemical or physical cleaning methods. An alternative to construction of field panels is consultation with the manufacturer of the natural hydraulic lime to estimate the efflorescence potential.

### Aesthetics of Repair and Original Areas/Cleaning

Field panels or manufacturer's samples should be compared to the original masonry with respect to joint color to evaluate whether there will be acceptable aesthetic differences between repair and original wall segments.

### Flashing

The current recommendation in Technical Note 29A on Garden Walls (Brick Industry Association) is that through wall flashing is used under the coping materials. Since flashing was not used in the original wall construction, "good judgment" as cited in the BIA Note implies that disturbing existing sound masonry to install coping is inappropriate.

### Engineering Evaluation/Tree Roots

Engineering evaluation of the wall should consider the recommendations in Brick Development Association (UK) Guide 12, "Design of Free Standing Walls." Further, the wall should meet criteria in current codes. The engineering evaluation should also consider potential root damage in an overall safety assessment.

## Appendix

Photographs by Street Location

Sample Location – Greene 2

Obtaining Greene 2
(Note mortar recession in the lower wall to the left of a pointed area.)

Top Course of Wall by Sumter near Greene
(Note mortar recession and vegetation in coping courses.)

Lower Courses of Wall by Sumter near Greene
(Note mortar recession in lower wall.)

Lower Courses of Wall by Sumter near Pendleton
(Note mortar recession in lower wall.)

Upper Wall by Sumter

Missing Bricks in Coping on Sumter

Excavation on Carolina Library on Sumter – Near location for Sumter 1 and Sumter 2

Wall Opening - Pendleton

Note on Analytical Tests – Methods used in these analyses are described in the following papers:

1. G. Chiari, G. Torroca, and M. Santarelli, Recommendations for Systematic Instrumental Analysis of Ancient Mortars: The Italian Experience, Standards for Preservation and Rehabilitation, ASTM STP 1258, American Society for Testing and Materials, 1996, pp. 275-284.

2. Denis A. Brosnan, Characterization and Degradation of Masonry Mortar in Historic Brick Structures, Journal of Structures, Volume 2014 (2014), Article ID 859879, 7 pages.

Notes on Methods

X-ray Fluorescence Spectroscopy (XRF) – a means of determining the chemical analysis of a specimen by using impinging monochromatic X-rays to excite atomic species in the specimen to produce X-rays of characteristic energy for those species in the specimen. By analyzing the energy of evolved X-rays, the chemical species in the specimen are identified, and the quantity of substances in the specimen is calculated from the intensity of X-rays generated by the specimen. The technique is used in analysis of rocks, cements, and ceramics. The usual convention of reporting the composition of species is in terms of metal oxides. The analysis of specimens in this report by XRF is for specimens after exposure to 1000$^{o}$C (oxidized basis).

Loss on Ignition – the weight loss of a specimen after heating in air to 1000$^{o}$C expressed as a percentage of the original sample weight. Oxidation of organic matter and mineral decompositions are typical reasons for weight loss.

X-ray Diffraction Analysis (XRD) – the determination of crystalline species in a specimen by observing the diffraction (bending) angle of monochromatic X-rays in a powdered specimen. The quantitative analysis of diffraction angle and intensity of X-rays allows a quantitative mineralogical analysis.

Soluble Anions and Cations – determination of the water soluble salts extracted from a specimen by immersion in deionized water at 20$^{o}$C with analysis of the leachate by ion chromatography (IC). The levels of calcium and magnesium from mortars are of interest. Likewise, the presence of anions like sulfate and chloride typically reflect intrusion of the water by ground or sea salts.

Mercury Intrusion Porosimetry (MIP) – mercury porosimetry is a technique for measuring the density, porosity, and pore sizes by intruding mercury into a dried specimen by applying pressure to the mercury surrounding the specimen. The volume of mercury is carefully monitored as pressure is applied to the mercury, and the pore sizes are calculated using the Washburn equation. The MIP technique is well suited for analysis of small irregularly shaped specimens.

Simultaneous Thermal Analysis with Evolved Gas Analysis – the simultaneous observation of weight changes and energy flows on heating of a specimen with detection of gaseous species evolved over the specimen. As an example, the decomposition of calcium carbonate ($CaCO_3$) is typically seen near 800$^{o}$C was the $CO_2$ is released forming a residual of CaO (lime) with a theoretical weight loss of 44.0% of the original weight of the carbonate. More information is available at:


1. Brosnan, Denis A., Sanders, John P. and Hart, Stephanie A., “Application of Thermal Analysis in Preservation and restoration of Historic Masonry Materials, Part A: Characterization of Materials,” Journal of Thermal Analysis and Calorimetry (2011) 106:109-115.
2. Denis A. Brosnan, John P. Sanders, and R. Parker Stroble, “Application of Thermal Analysis in Preservation and Restoration of Historic Masonry Materials; Part B, Degradation of Materials”, Journal of Thermal Analysis and Calorimetry (2013) 113: 507-510.

Species observed by Thermal Analysis in Historic Mortars

| Reaction Temperature °C | Reaction I=endothermic E=exothermic | Species | Species Formula | Reference |
|---|---|---|---|---|
| 75-83 | E | Tobermorite | 3CaO-2SiO2-xH2O | Dwek, Goncalves (forms ettringite) |
| 50, 100. 160, 430 (major at 430) | E | Nontronite(Smectite-Montmorillonite family) | (CaO1/2Na)O.3Fe2(Si, Al)4O10 (OH)2-nH2O | Frost, Chippera and Bish |
| 60, 266,308, 551 (CO2 and H2O) | E | Iowaite | Mg4Fe(OH)8OCl-3H2O | Frost |
| 120-149 | E | Ettringite | 3CaO-Al2O3-3CaSO4-31H2O | Anato; Ibrahim et al |
| 120 | E | CSH (PC) | C-S-H gel | Alacron-Ruiz in PC, also portlandite (510) and calcite (820); Ibrahim et al |
| 120, 280, 265, 480, 980 | E | Nat cement | Lime-metakaolin | Moropoulou |
| 122 | E | Gypsum | CaSO4-2H2O | Forms hemihydrate (1/2 H2O) which dehydrates at 127C. Hemihydrate aka bassinite. Dweck, p. 460 in TA of Construction Materials. |
| 210-280 | E | Marialite | Varies Na4Al3Si9O24Cl to Na4(ALSi3O8)3(Cl2, CO3, SO4) | Benavides. |
| 100-160 | E | Zeolites | Varies | Maichrzak, also 710C |
| 248, 364 | E | Iron hydroxide and/or iron sulfate hydrate | FeO(OH); water evolution | Zhao, Corrosion Science 53 (2011) 1646-1658. Seen in in Unitarian Church, Chas, 7/13. |
| 478 | E | Iron sulfate (from rust sulfidated) | SO2 evolution | Pong et. al., Thermal decomposition of siderite (2007); Siriwardane et. al., up to 500C. Seen in in Unitarian Church, Chas, 7/13. |
| 486 | E | Iron carbonate (from rust carbonation) | CO2 evolution | Seen in in Unitarian Church, Chas, 7/13. |
| 300-400 or 337-499 | E | Brucite | Mg(OH)2 | Kais, Goncalves |
| 400-460 also cited as 437 or 442 | E | Portlandite | Ca(OH)2 | Dweck; Ibrahim et al give 450-600 but show as 520C. |
| ~520 | E | Aragonite to calcite | CaCO3 | Handbook C+P, Antao, Canadian Mineralogist 97 (2012) 707-712. |
| ~573 | I | Alpha to Beta Quartz | SiO2 | |
| 622, 682, or820 | E | Calcite (661-700 in vacuo) [680-800 untrafine] | CaCO3 | Dweck, depends on crystallinity (Beruto, TCA 424 (2004) 99-109) [Ren?, JTAC 91 (2008) 867-871 in "The Influence of Morphology pf Ultrafine Calcite on Decomposition Kinmetics] |
| 680-720 | E | Magnesite | MgCO3 | Liu, JTAC 107 (2012) 407-412 |
| 700C + and 900C | E | Sodalite (hauyne) | Na4(Al3Si3)O12Cl | Khajovi |

Microscopy – use of traditional techniques using transmitted and reflected light microscopy (petrography) and scanning electron microscopy (SEM). The SEM analysis usually involved phase quantification using energy dispersive X-ray analysis (EDAX), a technique providing chemical analysis of individual features in a specimen microstructure. For more information, see:


1. S. DeHayes and D. Stark, Petrography of Cementitious Materials, ASTM STP 1215, The American Society for Testing and Materials (1994).

2. J. Elsen, Microscopy of Historic Mortars, Cement and Concrete Research 36 (2006), 1416 – 1424.

3. Denis A. Brosnan and John P. Sanders, Microscopic Characterization of Clay Bricks and Its Use in Forensic Analysis, *Annual for the Brick and Tile, Structural Ceramics and Clay Pipe Industries,* Bauverlag BV GmbH (2012) 101-115.

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**Quantitative X-Ray Fluorescence**
**(Oxidized Basis) Report**

04/25/2014

| COMPANY INFORMATION | | | |
|---|---|---|---|
| Name: | Denis Brosnan<br>PO Box 613<br>Pendleton, SC 29670 | Plant: | Denis Brosnan |
| Report Name: | **Quantitative X-Ray Fluorescence (Oxidized Basis)** | Technician: | Michael Mason |

**RESULTS**

| **Major Constituents** | **Unit** | ***Greene 1*** *Oxidized 4/24/2014* | ***Greene 2*** *Oxidized 4/24/2014* | ***Sumter 1*** *Oxidized 4/24/2014* | ***Sumter 2*** *Oxidized 4/24/2014* | |
|---|---|---|---|---|---|---|
| Al2O3 | % | 0.80 | 0.80 | 0.80 | 2.32 | |
| SiO2 | % | 79.64 | 88.72 | 80.50 | 80.95 | |
| Na2O | % | <0.7 | <0.7 | <0.7 | <0.7 | |
| K2O | % | 0.05 | 0.12 | 0.06 | 0.10 | |
| MgO | % | 2.04 | 0.65 | 1.55 | 0.55 | |
| CaO | % | 16.35 | 8.38 | 16.00 | 14.49 | |
| TiO2 | % | 0.11 | 0.17 | 0.10 | 0.22 | |
| MnO | % | 0.02 | 0.02 | 0.02 | 0.03 | |
| Fe2O3 | % | 0.32 | 0.46 | 0.30 | 0.64 | |
| P2O5 | % | 0.07 | 0.07 | 0.07 | 0.07 | |
| S | % | <0.05 | <0.05 | <0.05 | <0.05 | |
| Sum of Major Constituents | % | 99.40 | 99.39 | 99.40 | 99.37 | |
| **Minor Constituents** | | | | | | |
| Cl | ppm | <250 | <250 | <250 | <250 | |
| V | ppm | <150 | <150 | <150 | <150 | |
| Cu | ppm | 38 | 27 | 39 | 34 | |
| Zn | ppm | <20 | <20 | <20 | <20 | |
| Zr | ppm | <20 | 331 | 62 | 130 | |
| Ba | ppm | 200 | <200 | <200 | <200 | |



Lab Reference: 5610.10286,10287,10288,10289



Key Observations:

- CaO (from binder) at expected levels in Greene 1 and Sumter 1, but results for Greene 2 and Sumter 2 suggest CaO depletion.
- $Al_2O_3$ content higher than expected and "very high" for Sumter 2 – suggesting clay additions to the mortar mix.

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**Loss on Ignition Report**

04/25/2014

| COMPANY INFORMATION | | | |
|---|---|---|---|
| Name: | Denis Brosnan<br>PO Box 613<br>Pendleton, SC 29670 | Plant: | Denis Brosnan |
| Report Name: | **Loss on Ignition** | Technician: | Michael Mason |

**RESULTS**

| | LOI (%) | | | | | Test Date |
|---|---|---|---|---|---|---|
| **Greene 1** | 13.58 | | | | | 4/23/2014 |
| **Greene 2** | 7.32 | | | | | 4/23/2014 |
| **Sumter 1** | 12.89 | | | | | 4/23/2014 |
| **Sumter 2** | 8.46 | | | | | 4/23/2014 |



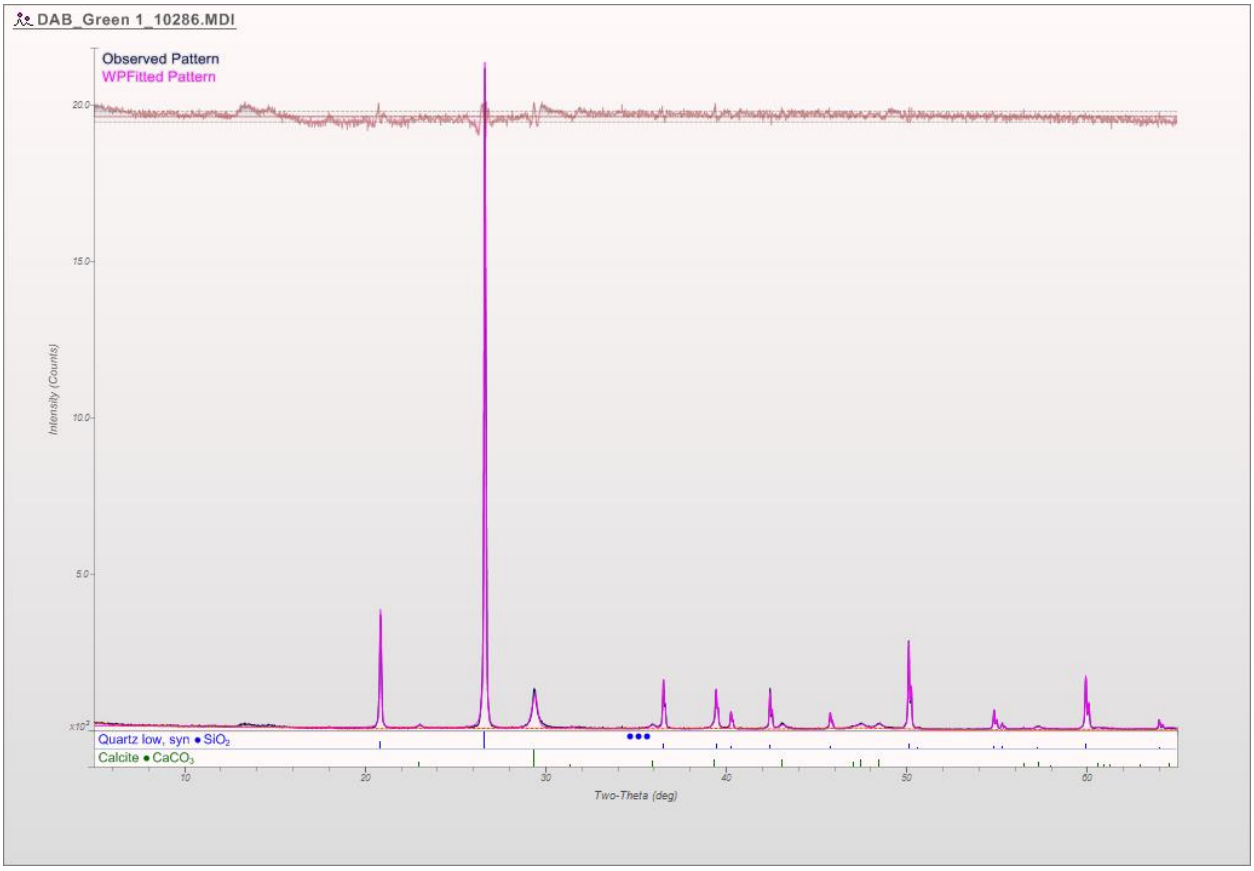
Lab Reference: 5610.10286,10287,10288,10289

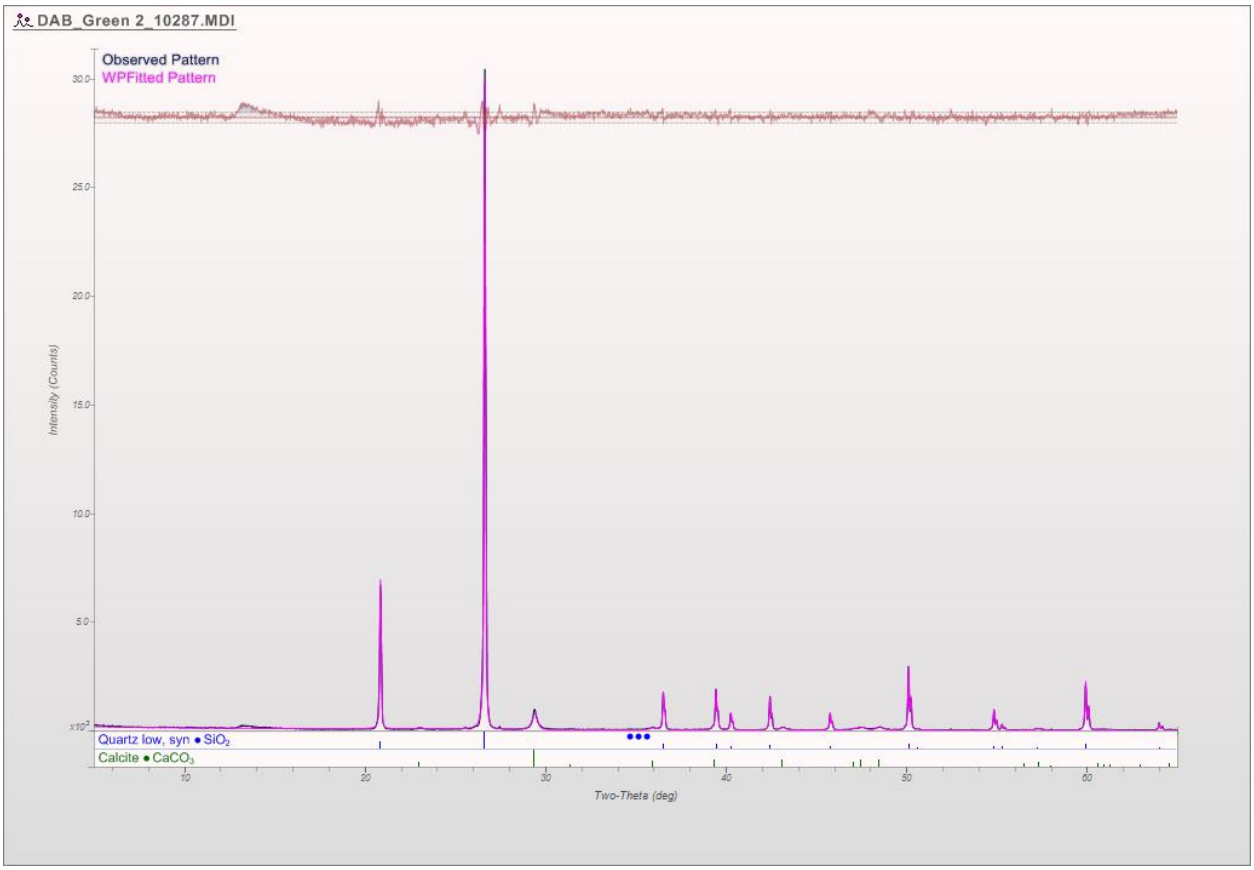
Page 1 of 1

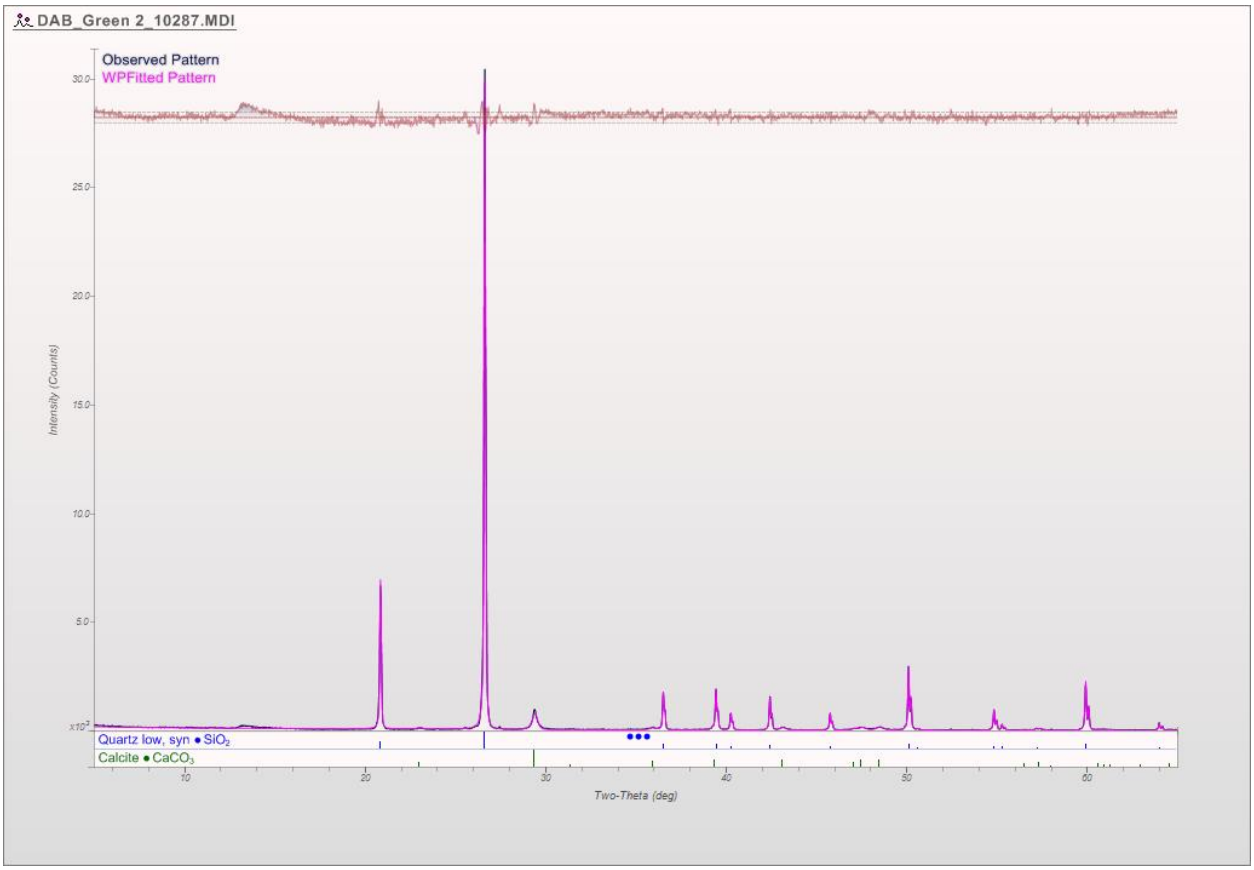
Key Observations:

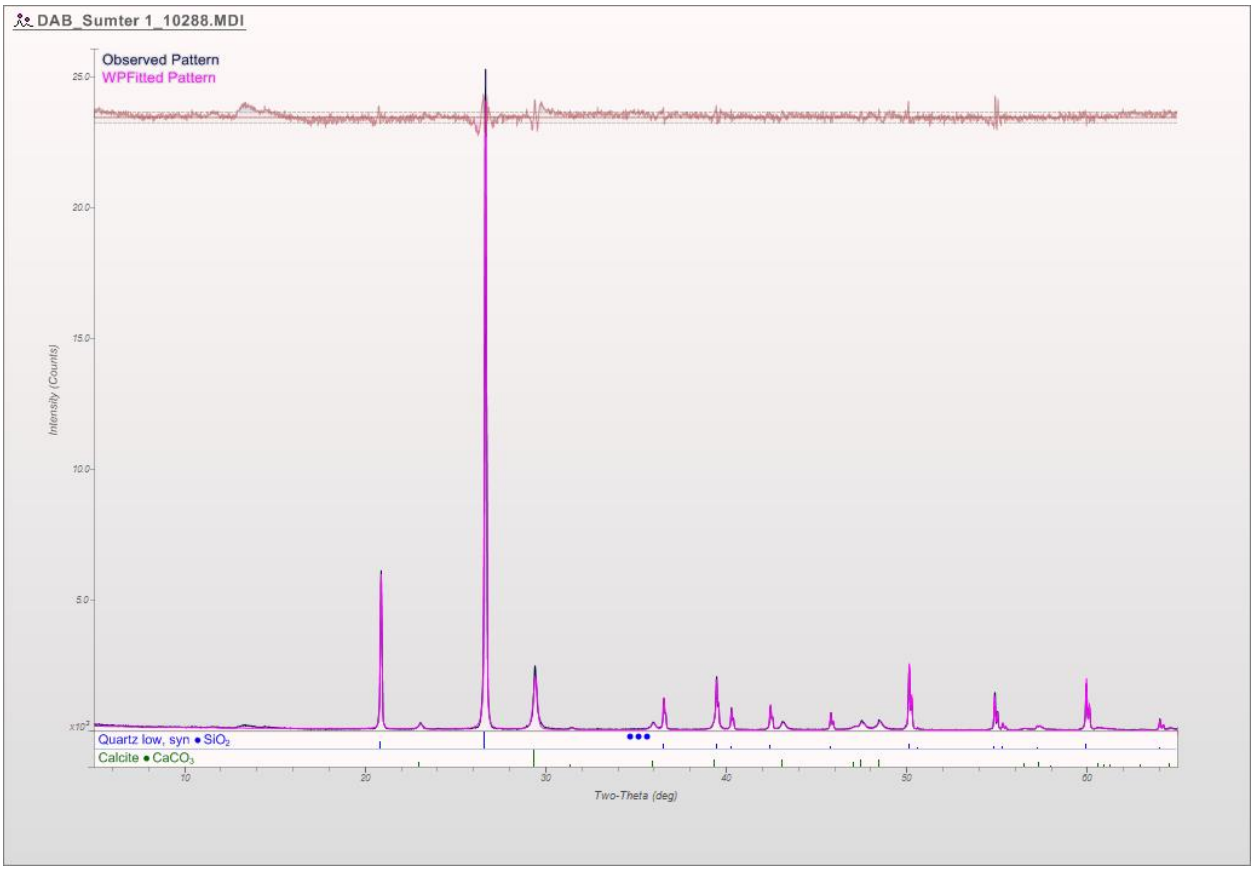
- Lower LOI suggesting carbonate binder depletion in Greene 2 and Sumter 2 as compared to Greene 1 and Sumter 1 respectively. Note that LOI also contains a component due to oxidation of organic matter (carbon).

X-ray Diffraction




DAB_Green 2_10287.MDI
Observed Pattern
WPFitted Pattern
Intensity (Counts)
Two-Theta (deg)
Quartz low, syn • SiO2
Calcite • CaCO3


DAB_Green 2_10287.MDI
Observed Pattern
WPFitted Pattern
Intensity (Counts)
Quartz low, syn • SiO2
Calcite • CaCO3
Two-Theta (deg)


DAB_Sumter 1_10288.MDI
Observed Pattern
WPFitted Pattern
Intensity (Counts)
Quartz low, syn • SiO2
Calcite • CaCO3
Two-Theta (deg)

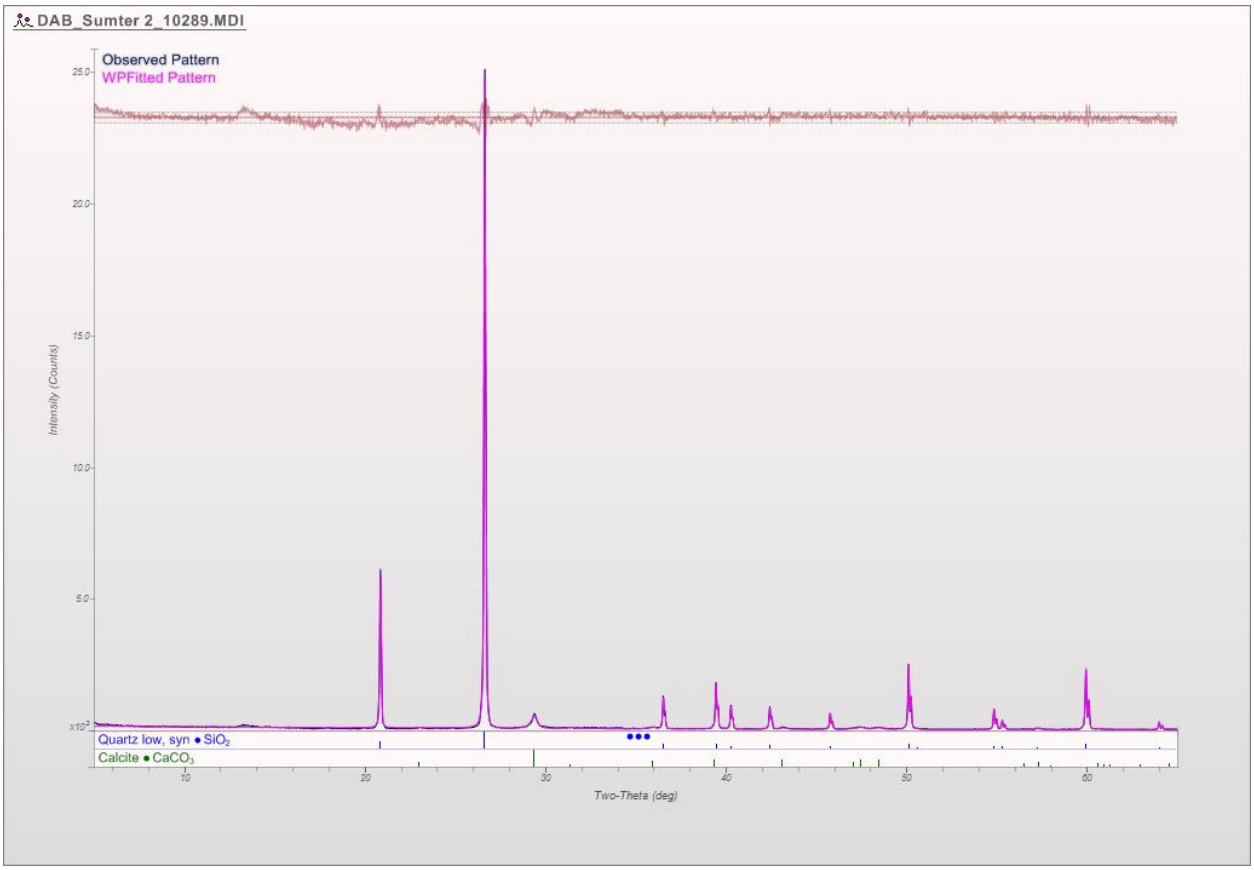



Table 1 – Estimated Phase Content by Whole Pattern Fitting Technique

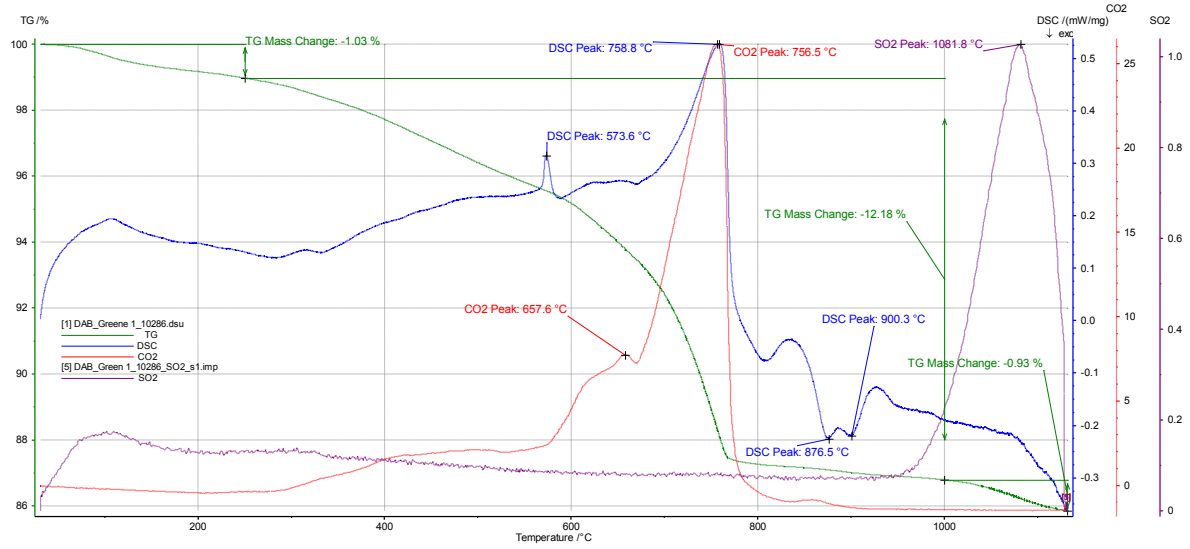
| Phase | Green 1 (10286) Wt. % (ESD) | Green 2 (10287) Wt. % (ESD) | Sumter 1 (10288) Wt. % (ESD) | Sumter 2 (10289) Wt. % (ESD) |
|---|---|---|---|---|
| Quartz | 86.1 (2.3) | 92.7 (3.0) | 91.1 (2.0) | 84.2 (2.1) |
| Calcite | 13.0 (0.5) | 6.4 (0.4) | 6.8 (0.3) | 14.9 (0.5) |
| Amorphous/Other | 1.0 (0.6) | 0.9 (0.7) | 2.1 (0.5) | 0.8 (0.5) |

Key Observations:

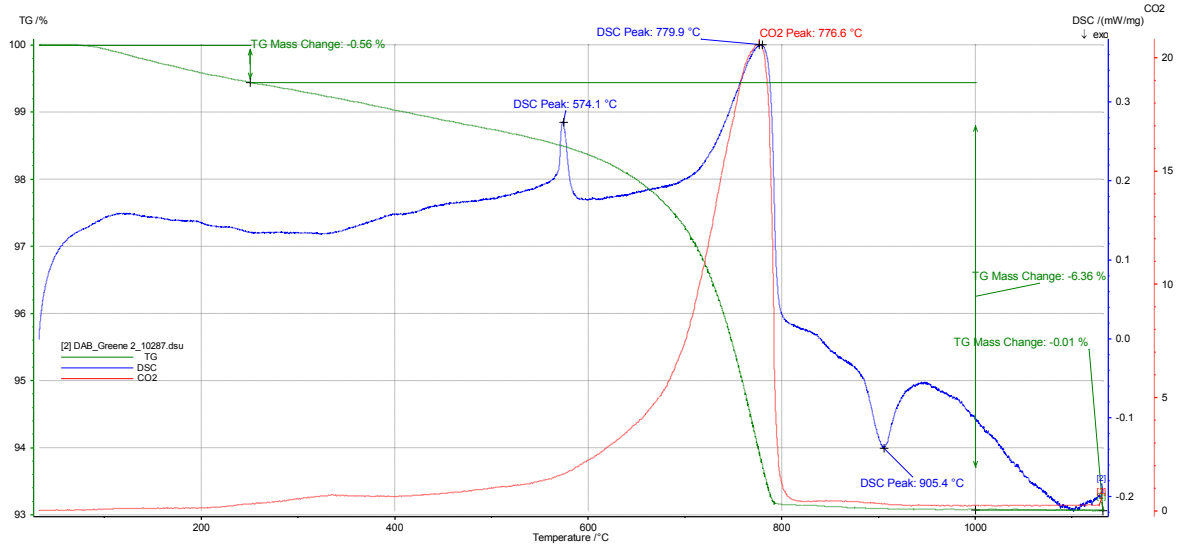
- Major components are calcite (binder) and quartz (sand).

Simultaneous Thermal Analysis with Evolved Gas Analysis

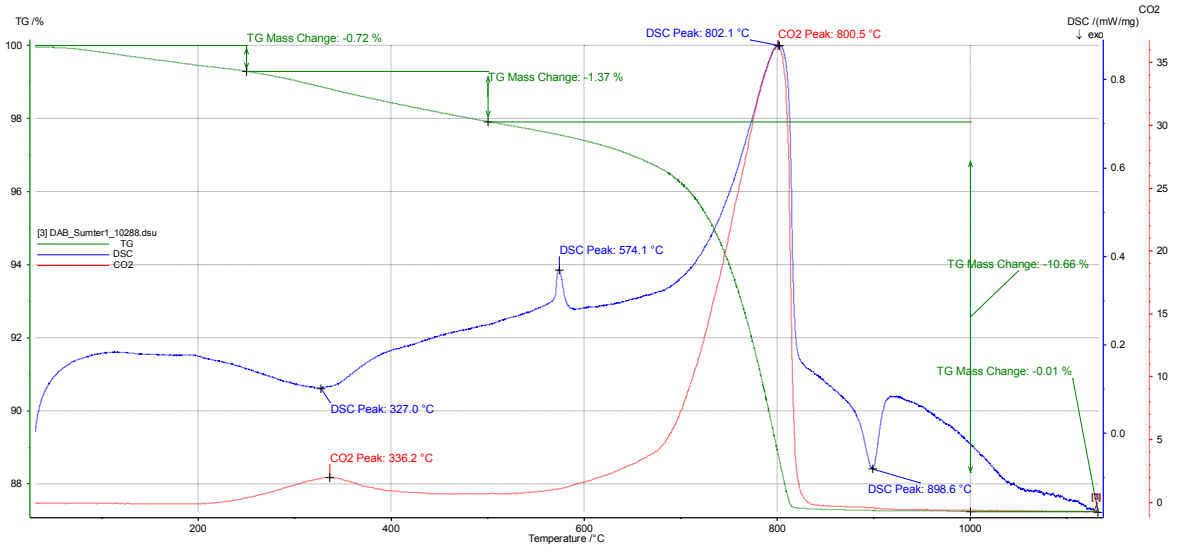
Key: Greene trace is the weight loss (thermogravimetric); Blue trace is the energy change (differential scanning calorimetry, downward peak is exothermic); Red trace is the $CO_2$ evolution (FTIR detection); and Black trace is the $SO_2$ evolution (if shown, by FTIR).



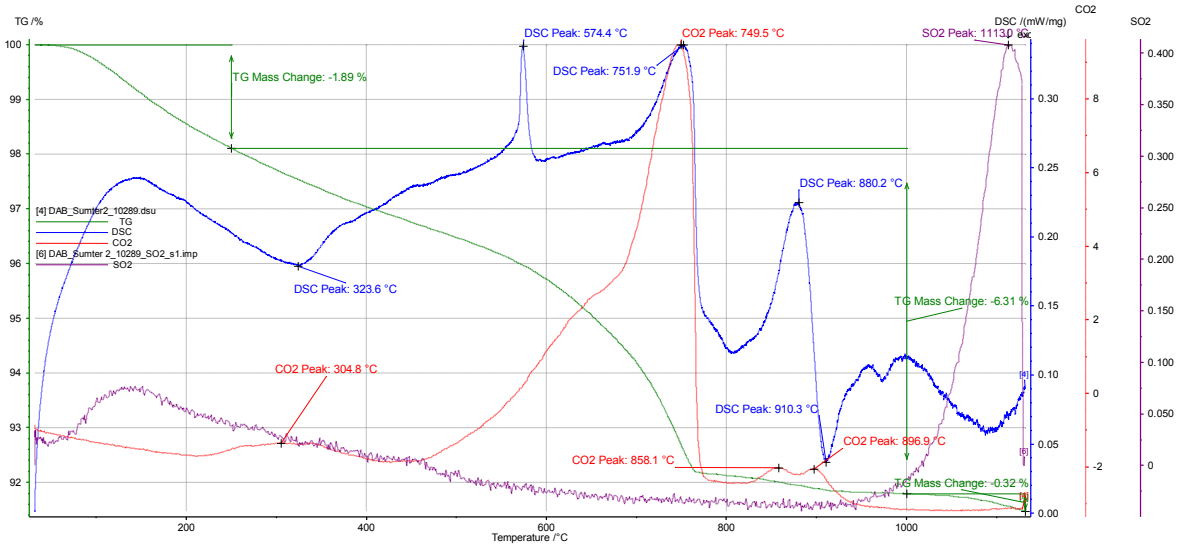

Greene 1




Greene2




Sumter 1




Sumter 2

Key Observations:

- All specimens exhibit the endothermic quartz inversion near 574ºC reflecting the sand content of the mortar.
- All specimens exhibit a large endothermic peak with $CO_2$ evolution near 750-800ºC reflecting the carbonate binder decomposition.
- The weight loss below 200ºC is likely due to ettringite decomposition. This phase is commonly found in mortars.
- All mortars exhibit $CO_2$ evolution in the area of 350-400ºC reflecting oxidation of organic matter forming $CO_2$.

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**Soluble Anions and Cations Report**

04/25/2014

| COMPANY INFORMATION | | | |
|---|---|---|---|
| Name: | Denis Brosnan<br>PO Box 613<br>Pendleton, SC 29670 | Plant: | Denis Brosnan |
| Report Name: | **Soluble Anions and Cations** | Technician: | Michael Mason |

**RESULTS**

| | Greene 1 | Greene 2 | Sumter 1 | Sumter 2 | |
|---|---|---|---|---|---|
| | | | | | |
| **Cations** | **Sample Concentration (ppm)** | **Sample Concentration (ppm)** | **Sample Concentration (ppm)** | **Sample Concentration (ppm)** | |
| Lithium | | | | | |
| Sodium | 2,061 | 19.7 | 9.3 | 14.5 | |
| Ammonium | 20.7 | 3.9 | 8.7 | 9.5 | |
| Potassium | 995 | 23.2 | 44.1 | 70.8 | |
| Magnesium | 92.9 | 286 | 230 | 31.1 | |
| Calcium | 6,358 | 953 | 886 | 7,894 | |
| Barium | | | | | |
| | | | | | |
| **Anions** | **Sample Concentration (ppm)** | **Sample Concentration (ppm)** | **Sample Concentration (ppm)** | **Sample Concentration (ppm)** | |
| Fluoride | 11.0 | 11.5 | 16.0 | 11.8 | |
| Chloride | 1,535 | 20.6 | 12.4 | 98.6 | |
| Nitrite | | | | 4.3 | |
| Bromide | | | | | |
| Nitrate | 6,202 | 3.4 | 1.2 | 207 | |
| Phosphate | 19.6 | | | | |
| Sulfate | 4,858 | 53.7 | 45.8 | 1,295 | |



Lab Reference: 5610.10286,10287,10288,10289

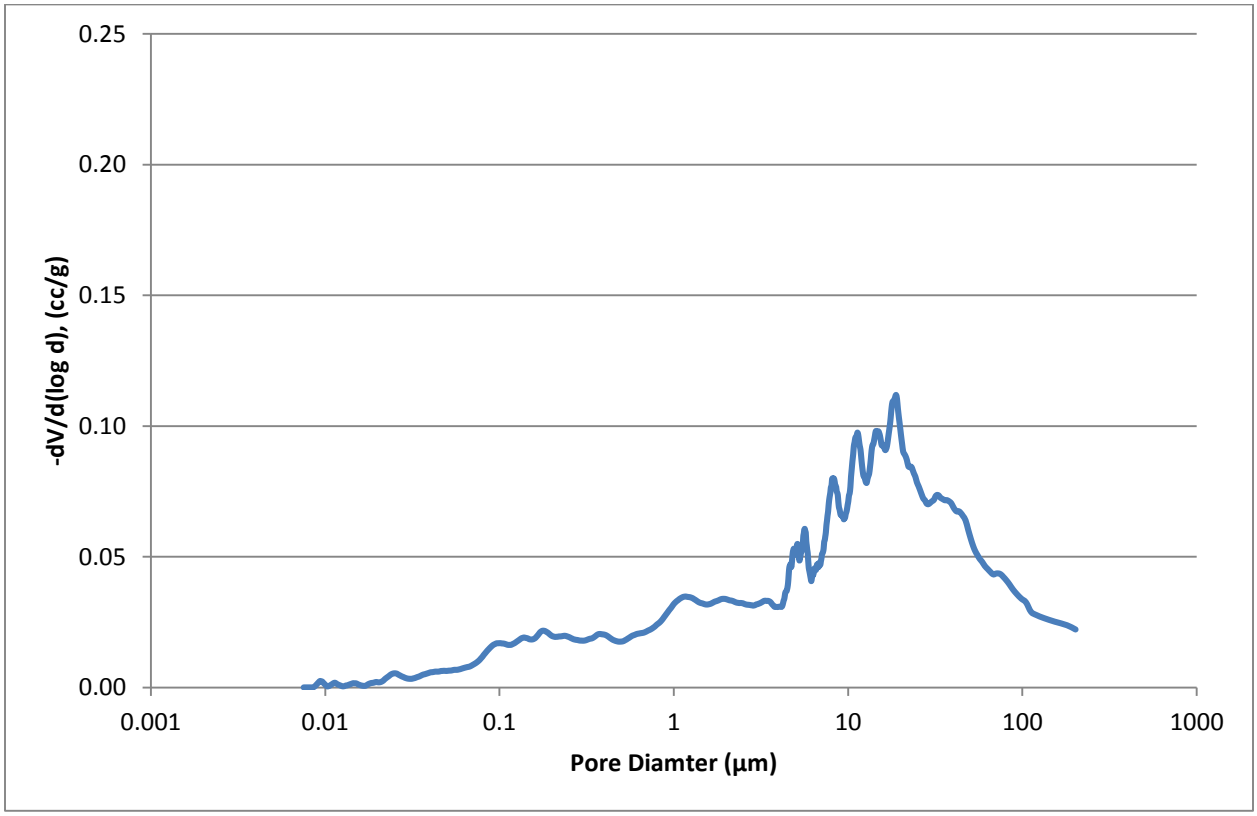


Key Observation:

- All mortars contain water soluble salts.
- Salt content trends are not consistent with position on the wall perhaps reflecting environmental factors.

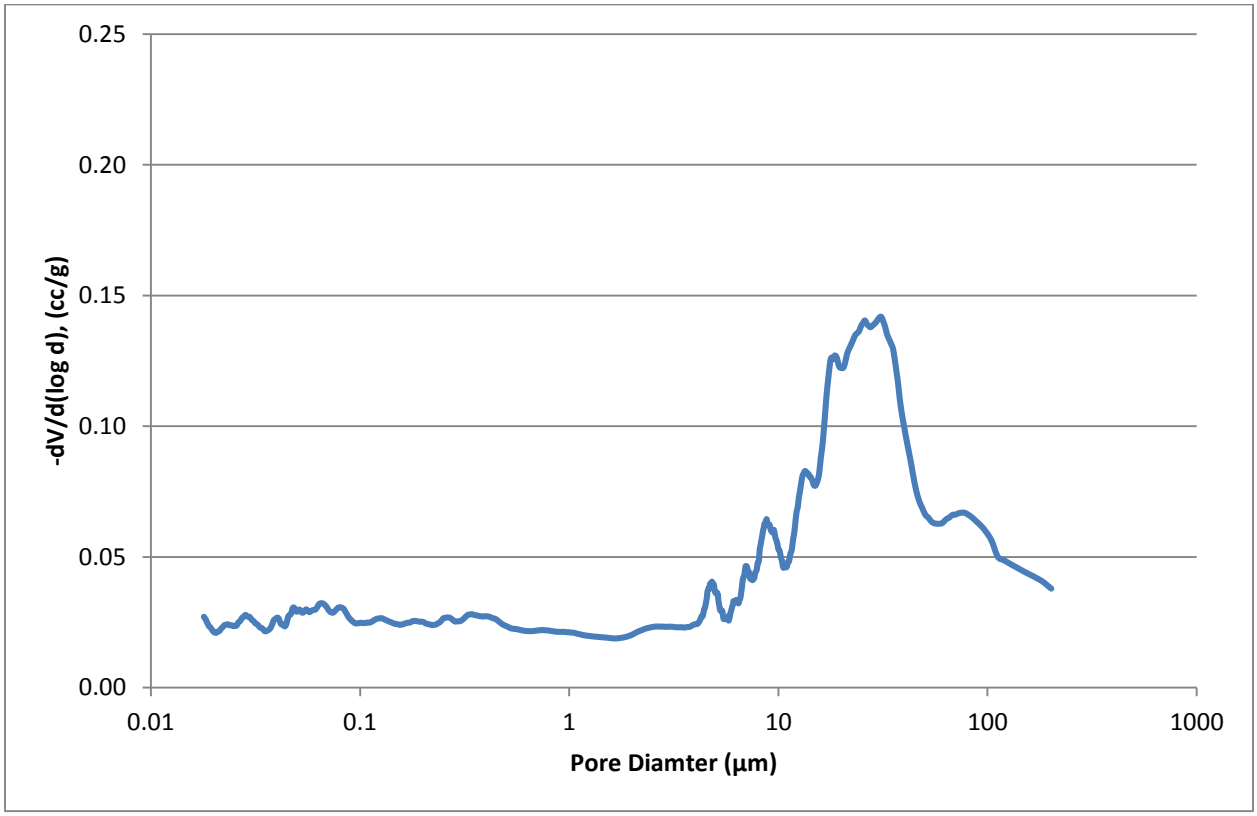
Mercury Intrusion Porosimetry
(MIP)
Greene 1
NBRC 5610/10286

| Property | Unit | |
|---|---|---|
| Total Intrusion Volume | ml/g | 0.147 |
| Median Pore Diameter | microns | 11.780 |
| Bulk Density | g/cc | 1.85 |
| Apparent Density | g/cc | 2.11 |
| Porosity | % | 27.08 |
| Total Surface Area | $m^2/g$ | 0.92 |
| Permeability (Accounting for Tortuosity Effects) | $nm^2$ | 0.36 |
| Pores >3 Microns | % | 72.04 |
| Pores >10 Microns | % | 54.61 |
| Pores 10-1 Microns | % | 28.15 |
| Pores <1 Microns | % | 17.24 |



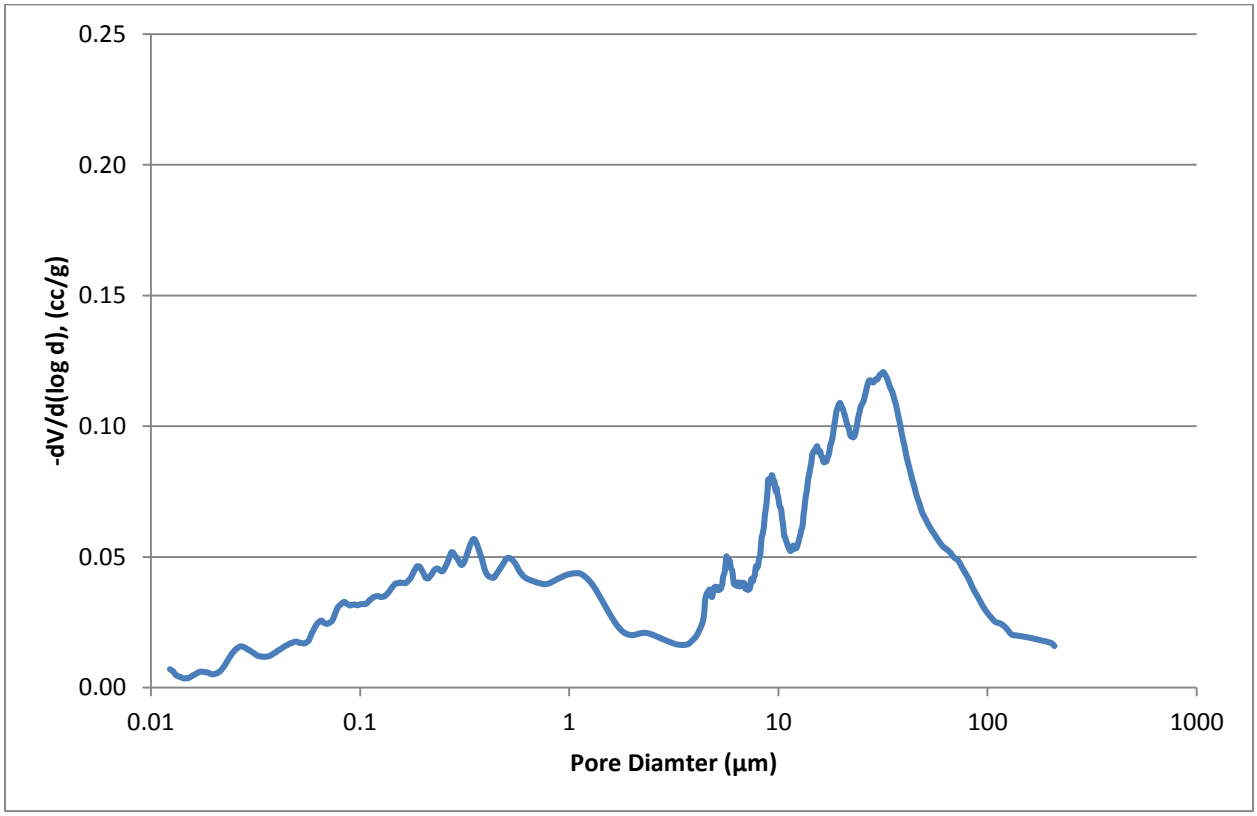
Greene 2
NBRC 5610/10287

| Property | Unit | |
|---|---|---|
| Total Intrusion Volume | ml/g | 0.191 |
| Median Pore Diameter | microns | 15.090 |
| Bulk Density | g/cc | 1.72 |
| Apparent Density | g/cc | 2.07 |
| Porosity | % | 33.01 |
| Total Surface Area | $m^2/g$ | 6.51 |
| Permeability (Accounting for Tortuosity Effects) | $nm^2$ | 0.02 |
| Pores >3 Microns | % | 66.02 |
| Pores >10 Microns | % | 56.11 |
| Pores 10-1 Microns | % | 15.08 |
| Pores <1 Microns | % | 28.80 |



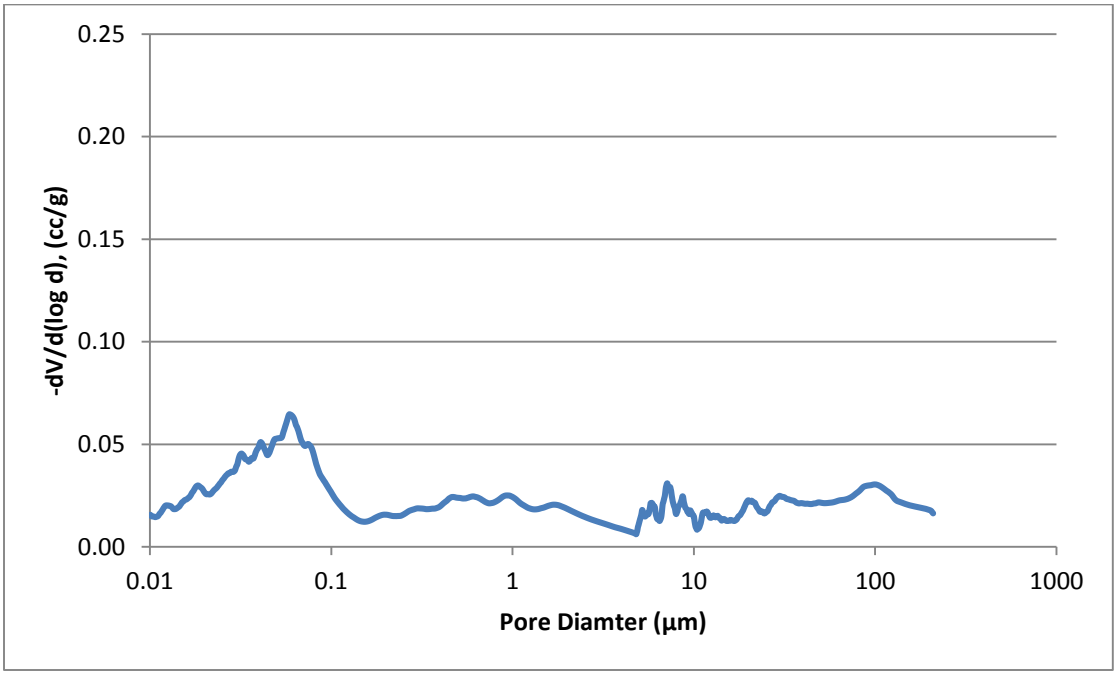
Sumter 1
NBRC 5610/10288

| Property | Unit | |
|---|---|---|
| Total Intrusion Volume | ml/g | 0.178 |
| Median Pore Diameter | microns | 9.228 |
| Bulk Density | g/cc | 1.71 |
| Apparent Density | g/cc | 1.97 |
| Porosity | % | 30.39 |
| Total Surface Area | $m^2/g$ | 2.38 |
| Permeability (Accounting for Tortuosity Effects) | $nm^2$ | 0.09 |
| Pores >3 Microns | % | 59.73 |
| Pores >10 Microns | % | 48.55 |
| Pores 10-1 Microns | % | 18.88 |
| Pores <1 Microns | % | 32.57 |



Sumter 2
NBRC 5610/10289

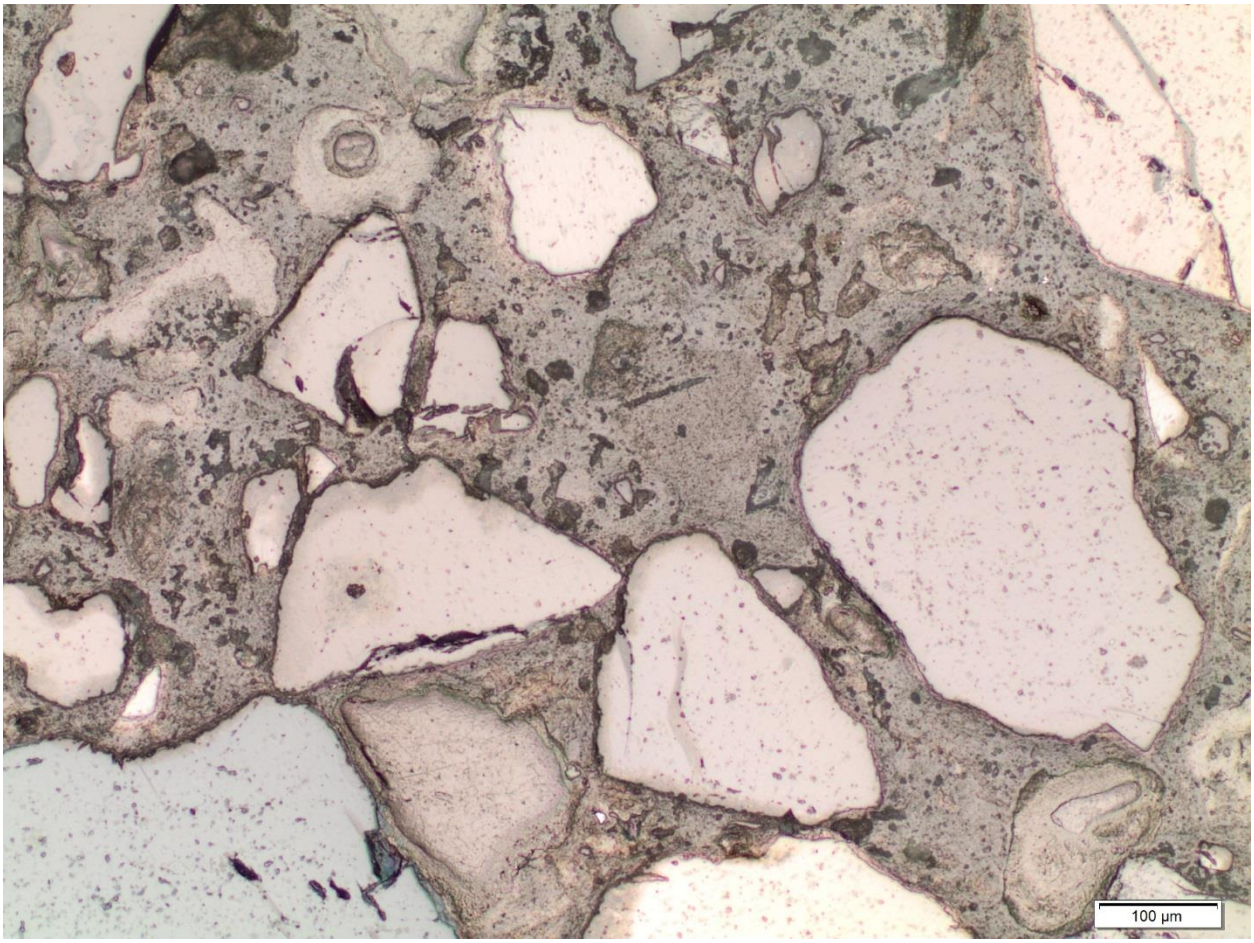
| Property | Unit | |
|---|---|---|
| Total Intrusion Volume | ml/g | 0.104 |
| Median Pore Diameter | microns | 0.475 |
| Bulk Density | g/cc | 1.93 |
| Apparent Density | g/cc | 2.04 |
| Porosity | % | 20.10 |
| Total Surface Area | $m^2/g$ | 6.68 |
| Permeability (Accounting for Tortuosity Effects) | $nm^2$ | 0.00 |
| Pores >3 Microns | % | 34.30 |
| Pores >10 Microns | % | 26.76 |
| Pores 10-1 Microns | % | 16.01 |
| Pores <1 Microns | % | 57.24 |



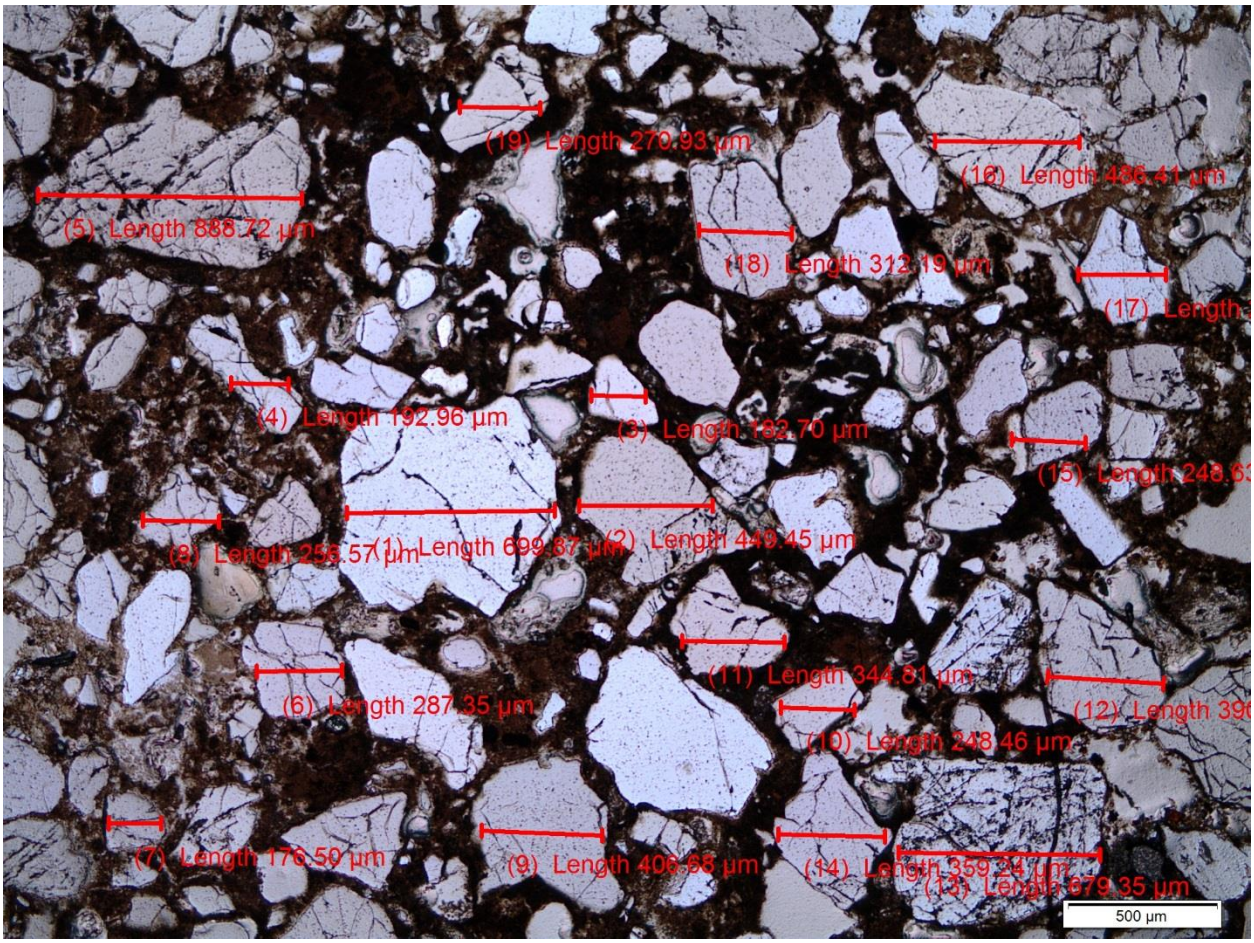

Key Observations:

- Mortars Greene 1, Greene2, and Sumter 1 exhibit expected porosities and fractions of porosity <1 micron.
- Mortar Sumter 2 exhibits a lower than expected porosity and a higher than expected fraction of pores >1 micron (perhaps reflecting the high clay content of the parent batch).

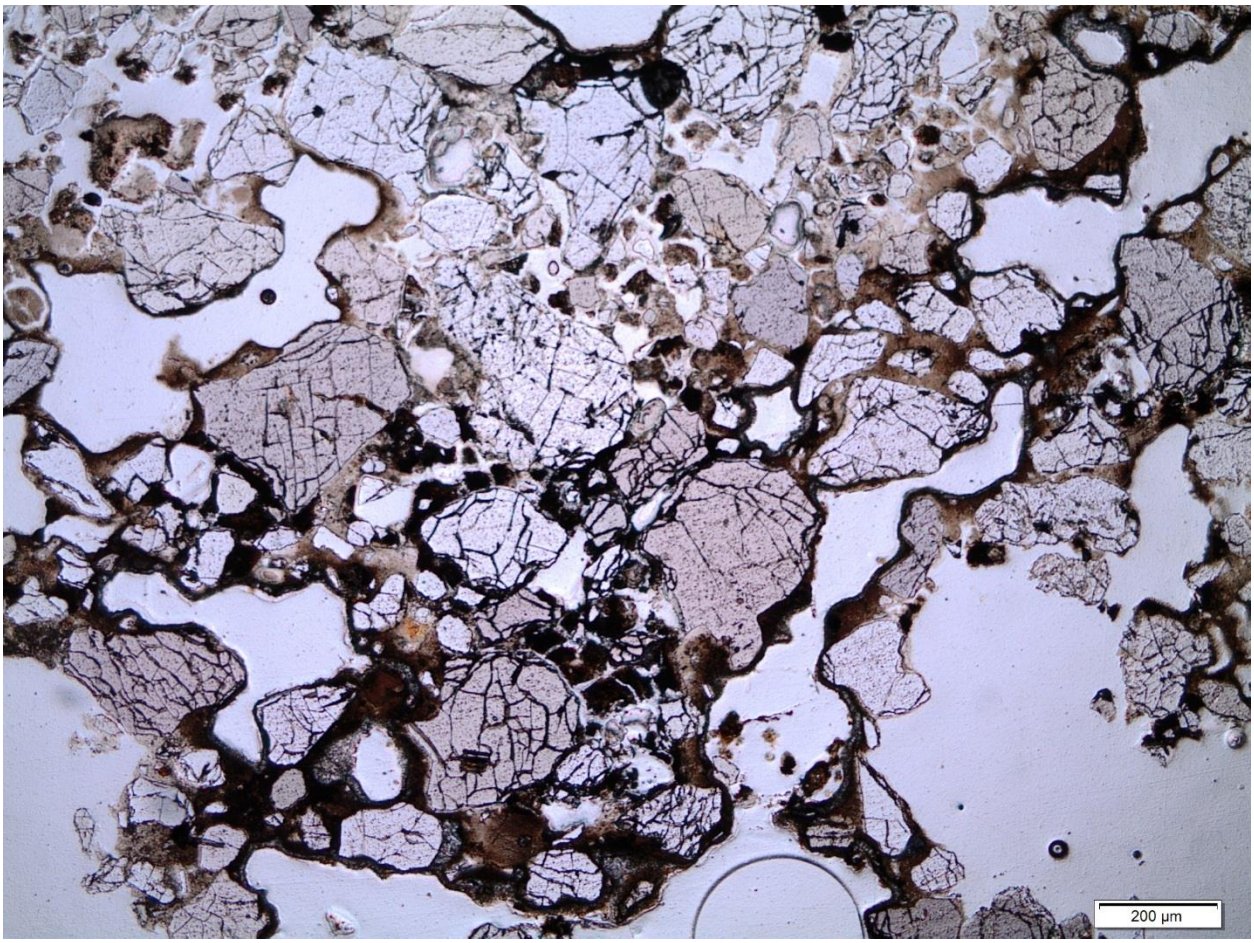
Petrographic Analysis/Light Microscopy



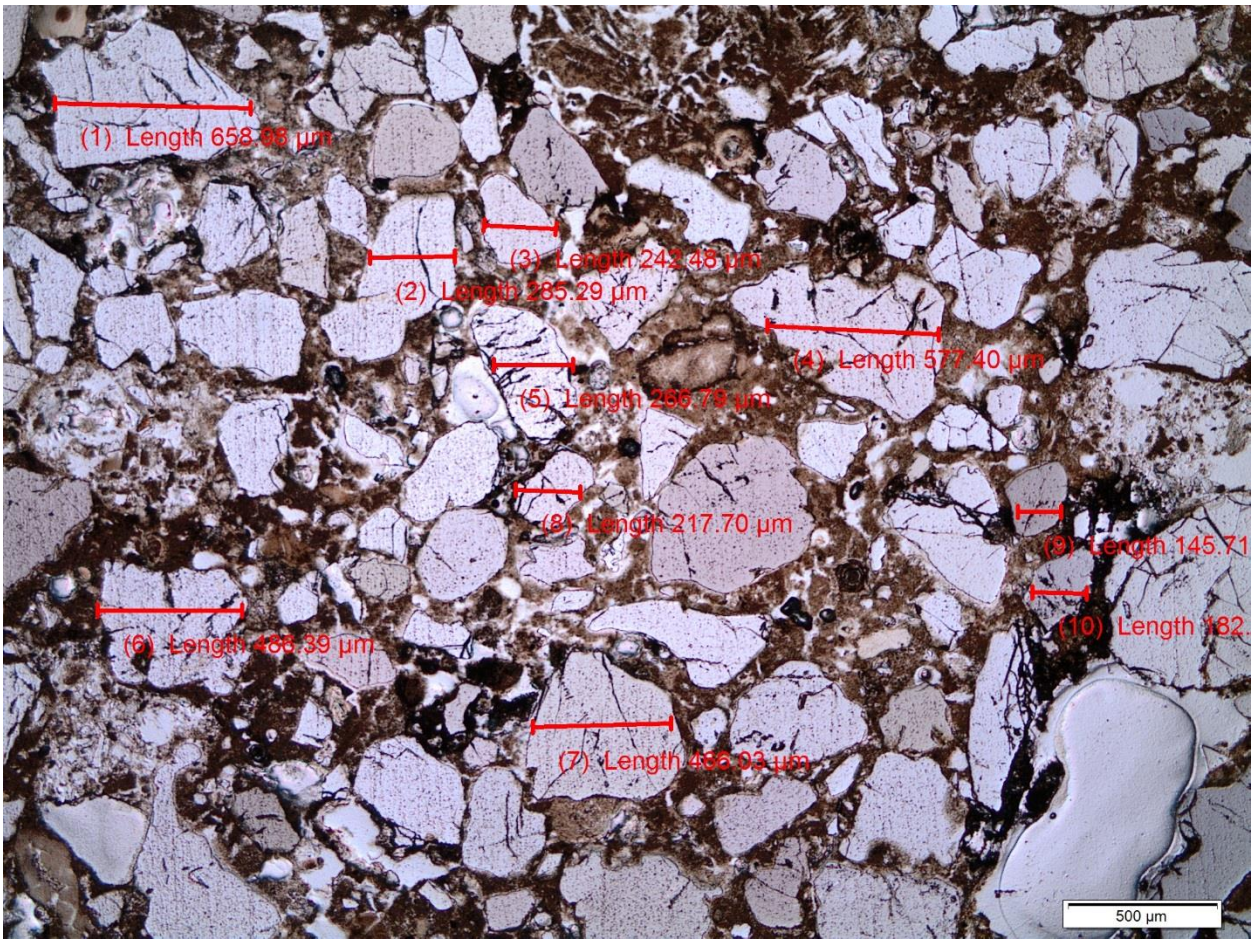

Specimen Greene 1 – Angular and Rounded Sand (Quartz) Crystals Surrounded by Binder Phase. Reflected light.



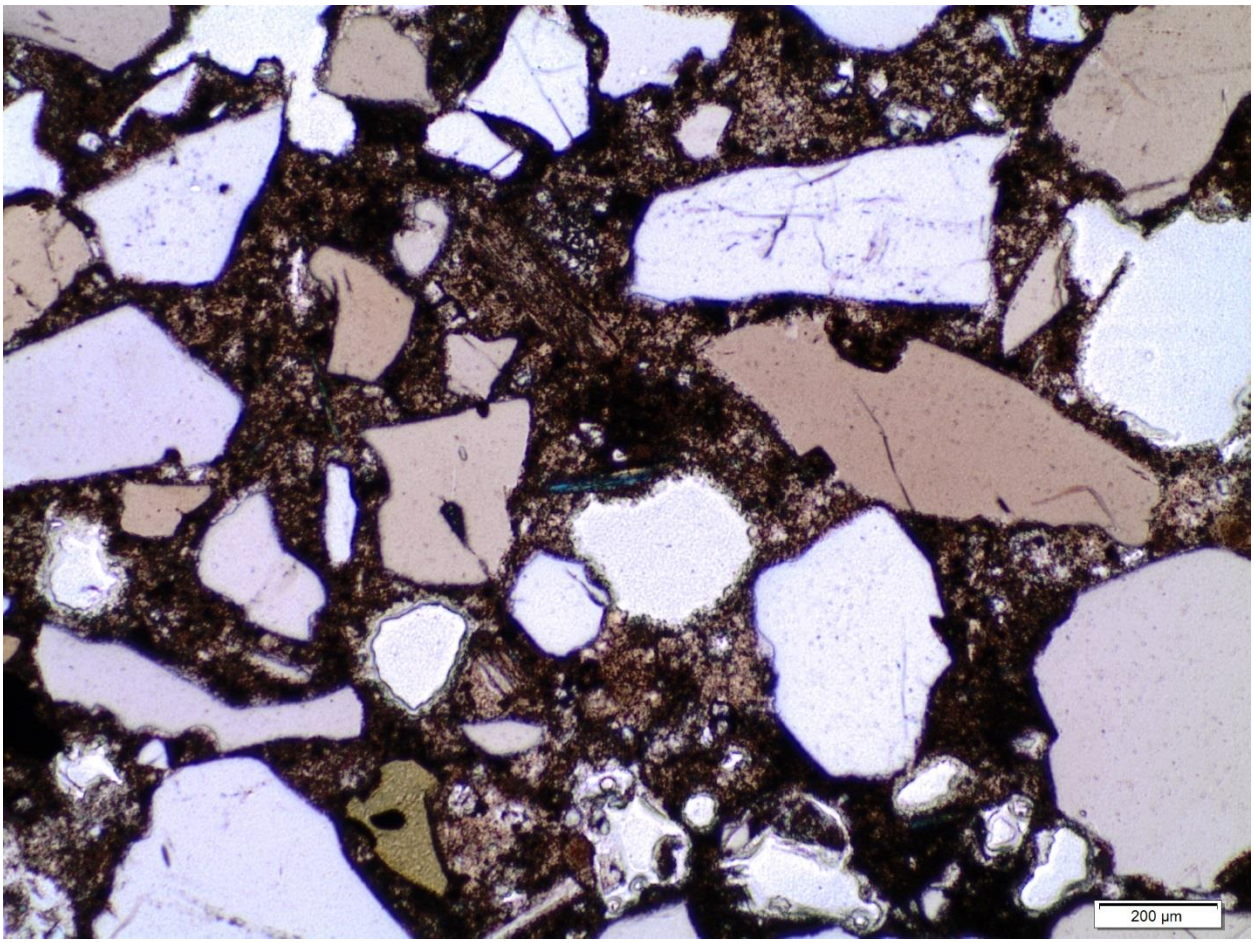
Specimen Greene 1 in Transmitted Light with Measurement of Sand Sizes (in micrometers or microns, µm)



Specimen Sumter 2 (by transmitted light) – Sand (Quartz) Crystals with Dispersed Dark Binder Phase with Considerable Porosity (white areas and "channels"). The level of porosity is likely due to partial removal of carbonate binder by intruding salt-laden water.



Specimen Sumter 1 in Transmitted Light with Measurement of Sand Sizes (in micrometers or microns, µm)



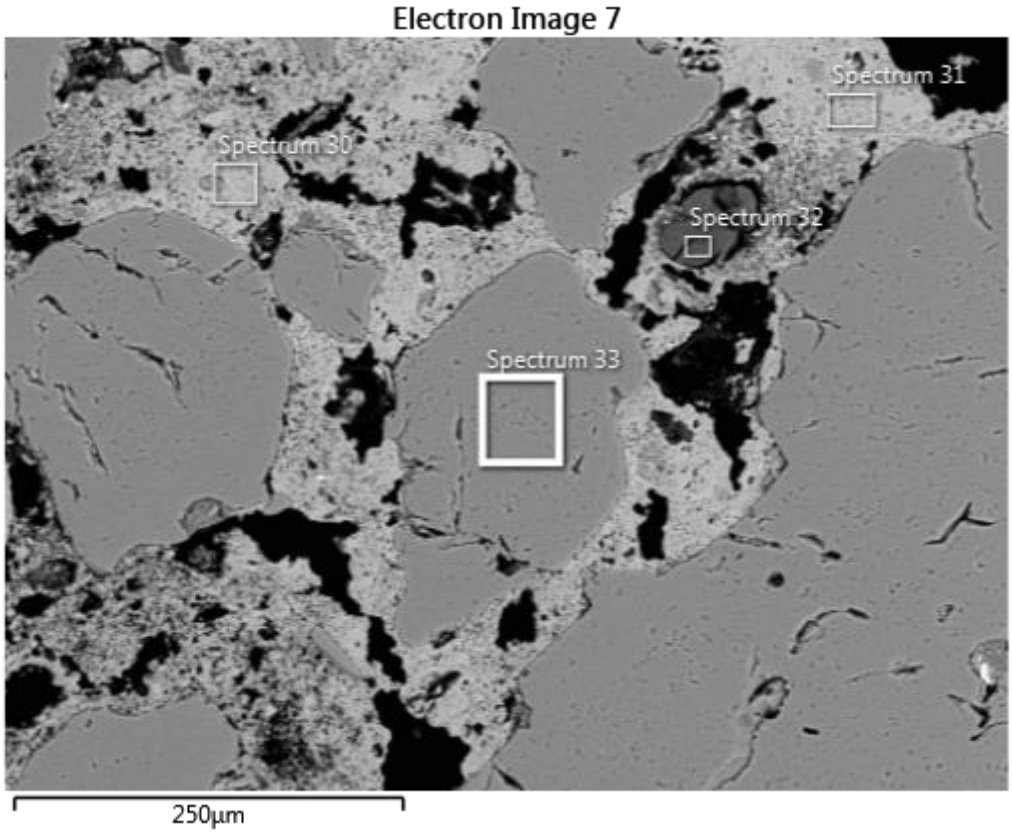
Sumter 2 (Transmitted Light)

Key Observations:

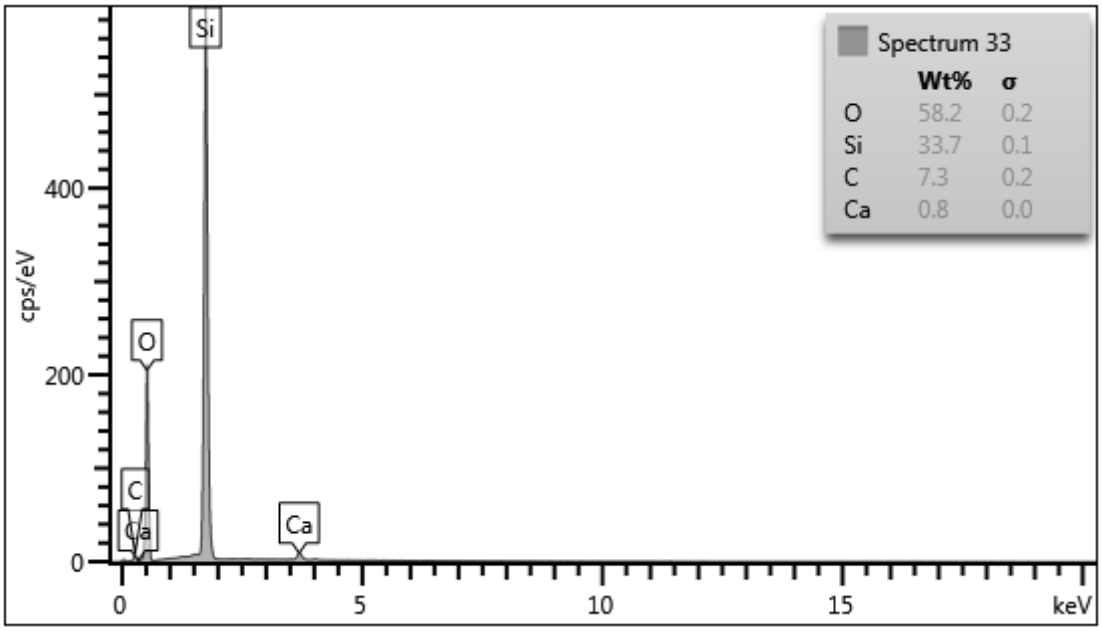
- Sand particle sizes are consistent with those expected in masonry bedding mortars.
- The binder phase contains small opaque or “black” particles, as seen in transmitted light photomicrographs. One object of SEM work was to identify these particles.
- Residual lime agglomerates were not seen in the microstructures suggesting reasonably efficient mixing of mortar constituents.

Scanning Electron Microscopy/EDAX

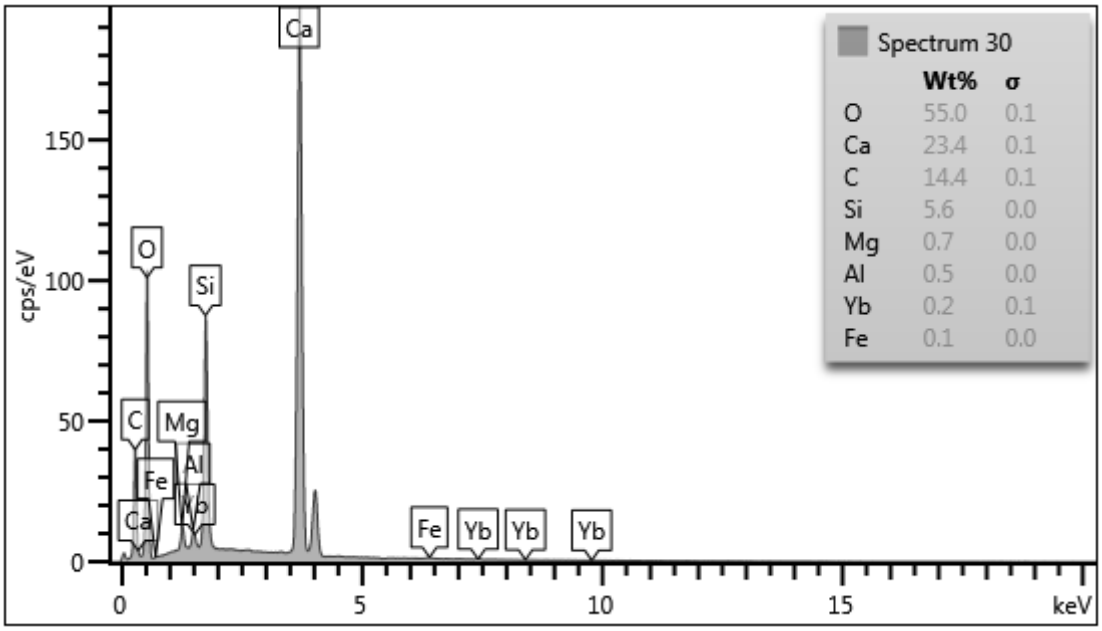
Sumter 1 (Area 2) – Sand (Spectrum 33) and Binder (Spectrum 30)



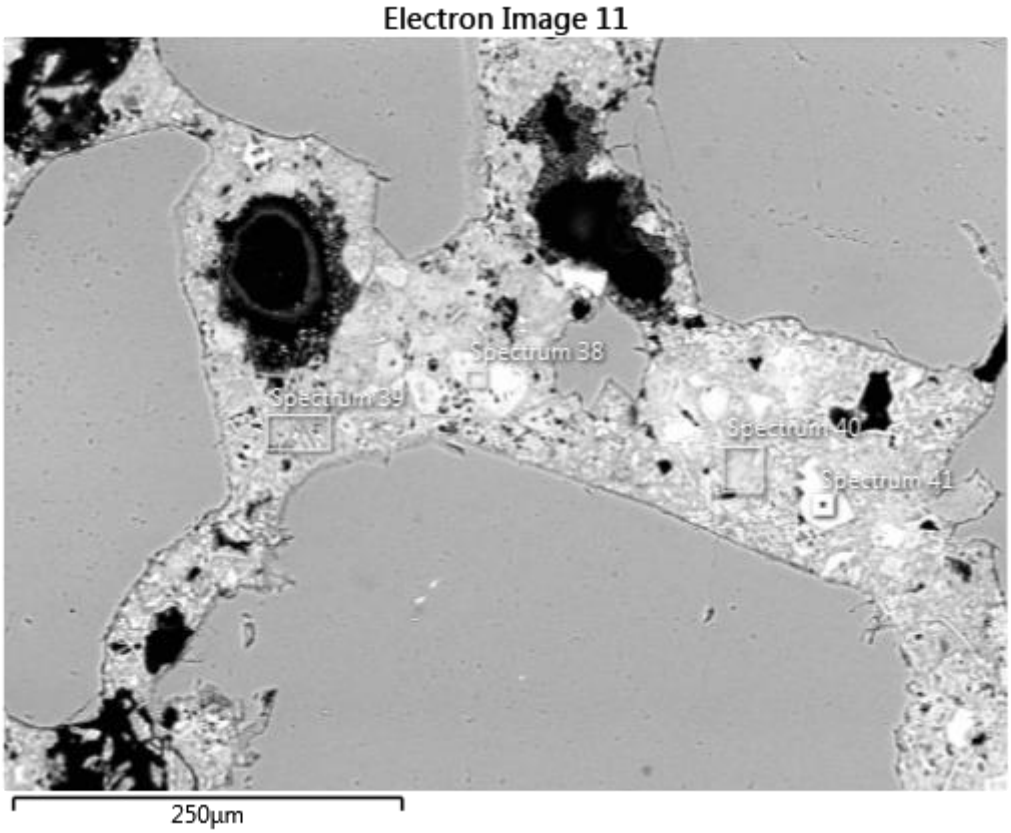

Spectrum 33 (Sand)



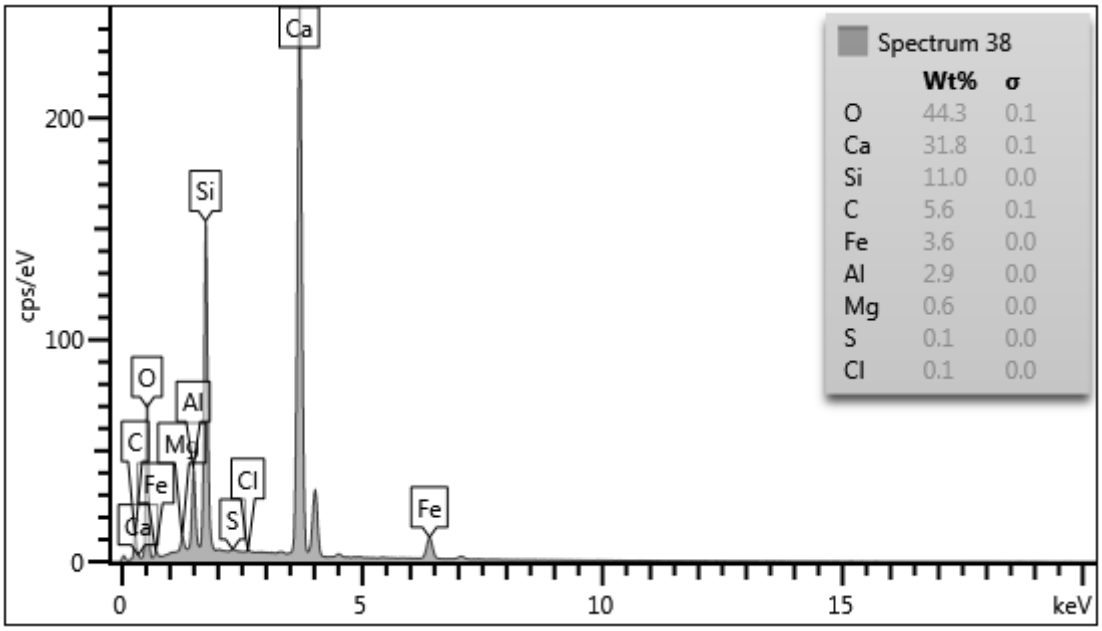
Spectrum 30 (Binder Phase)



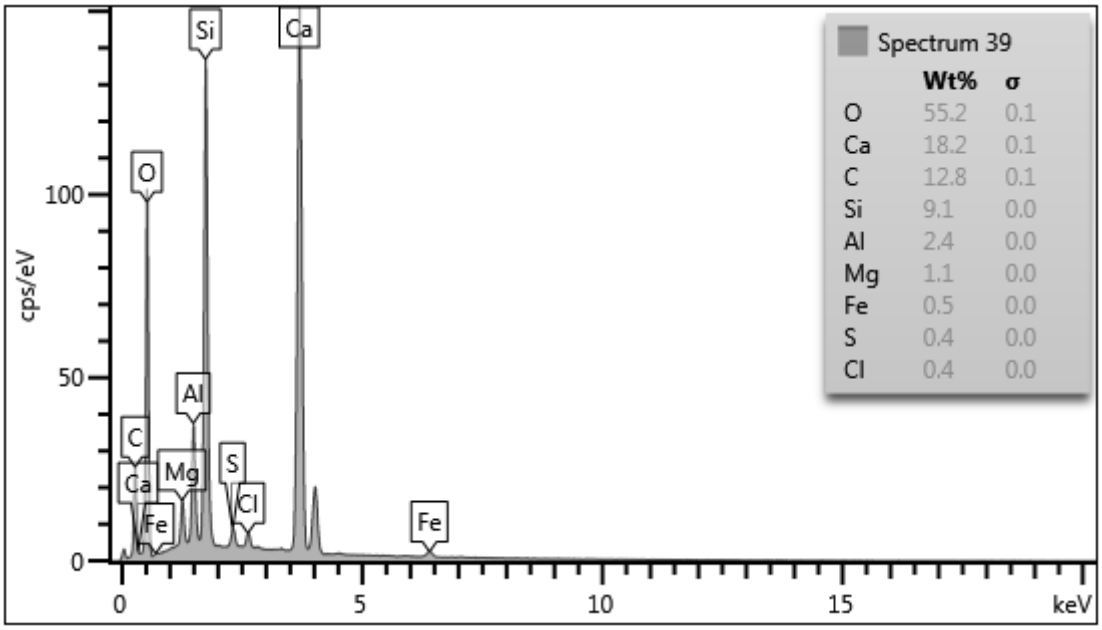
Sumter 2 – Sand (Grey Particles) with Lime Binder (Spectra 39 and 40) with Clay (Spectrum 38)



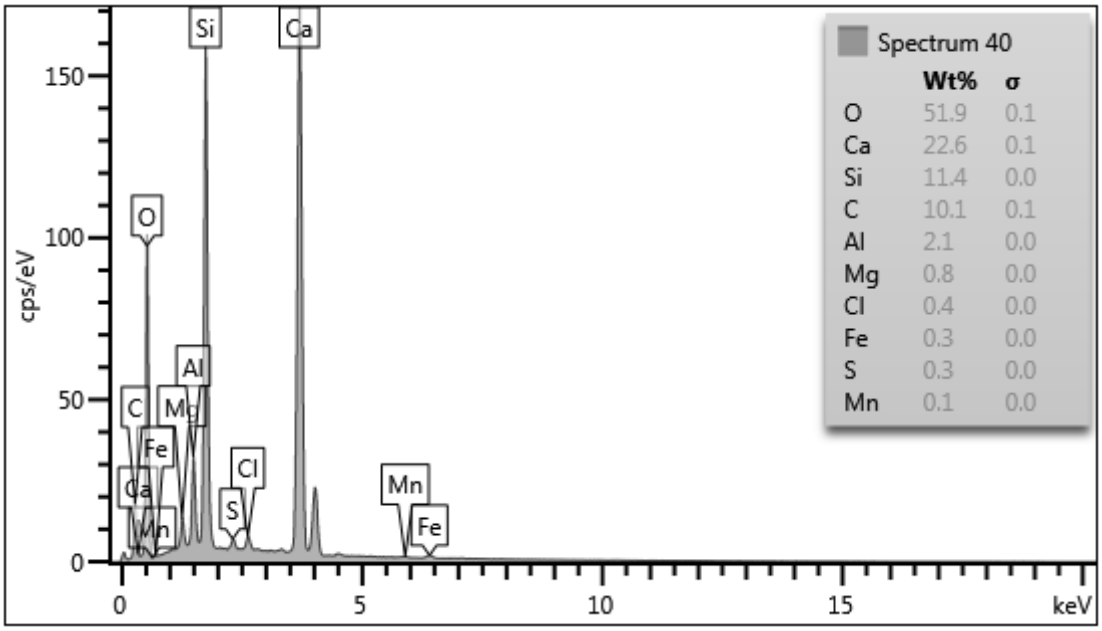

Spectrum 38 (Clay in Binder Phase)



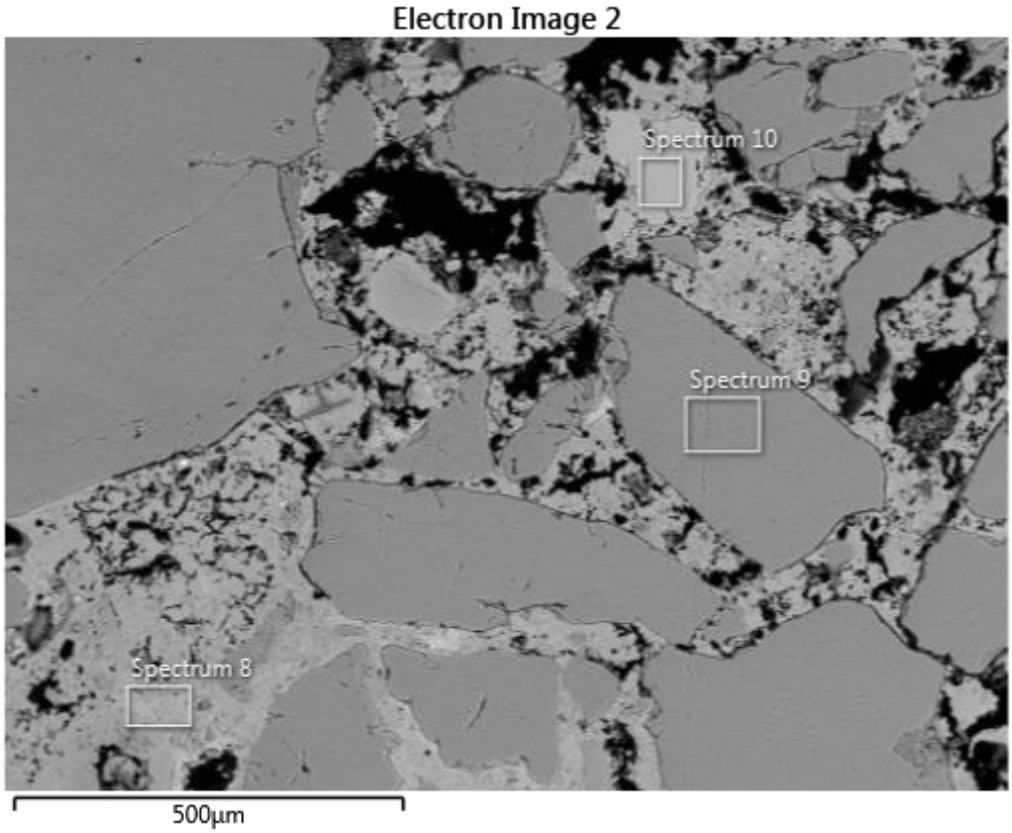
Spectrum 39 (Lime Rich Area in Binder Phase)



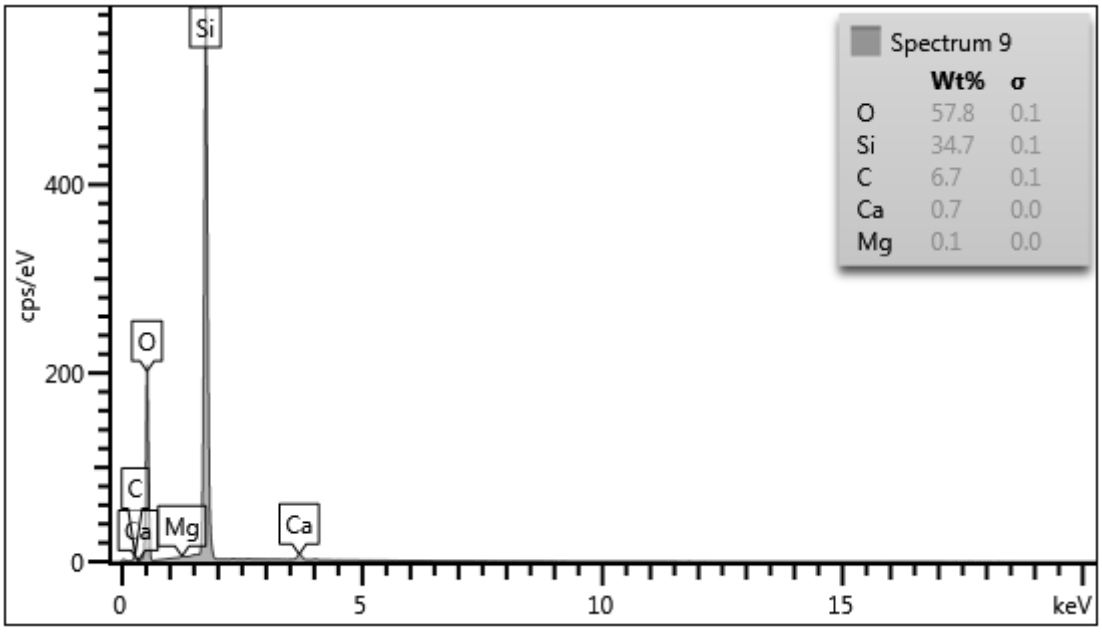

Spectrum 40 (Lime Rich Area in Binder Phase)



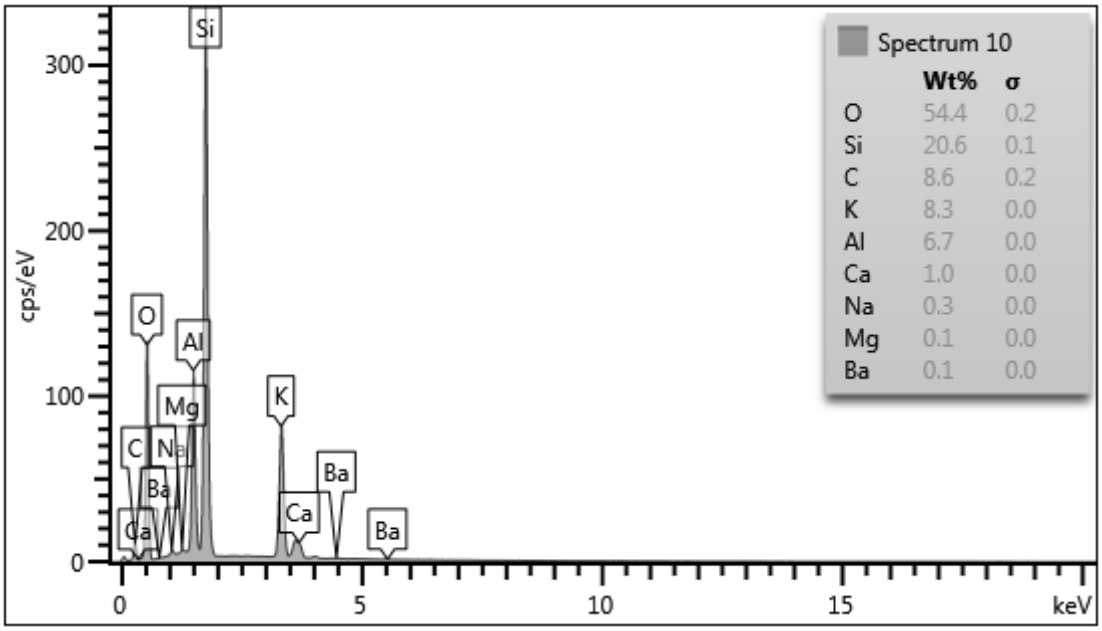
Greene 1 – Sand (Spectrum 9) and Clay in Binder phase (Spectrum 10)



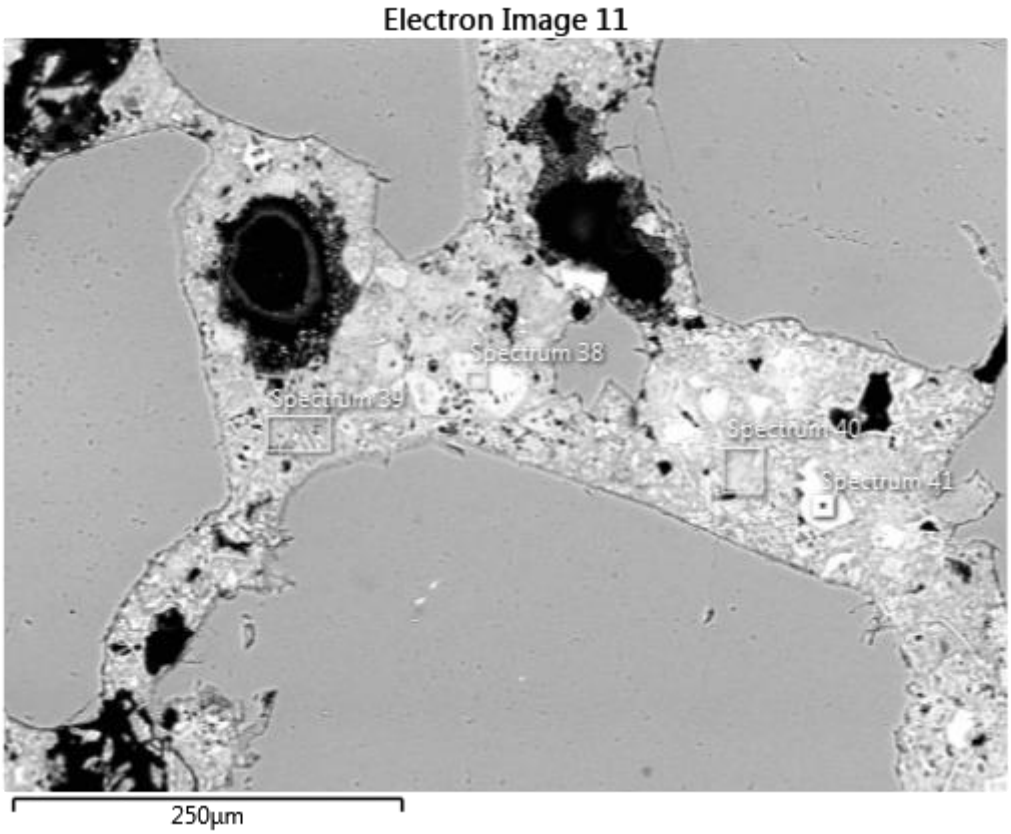

Spectrum 9 (Sand)



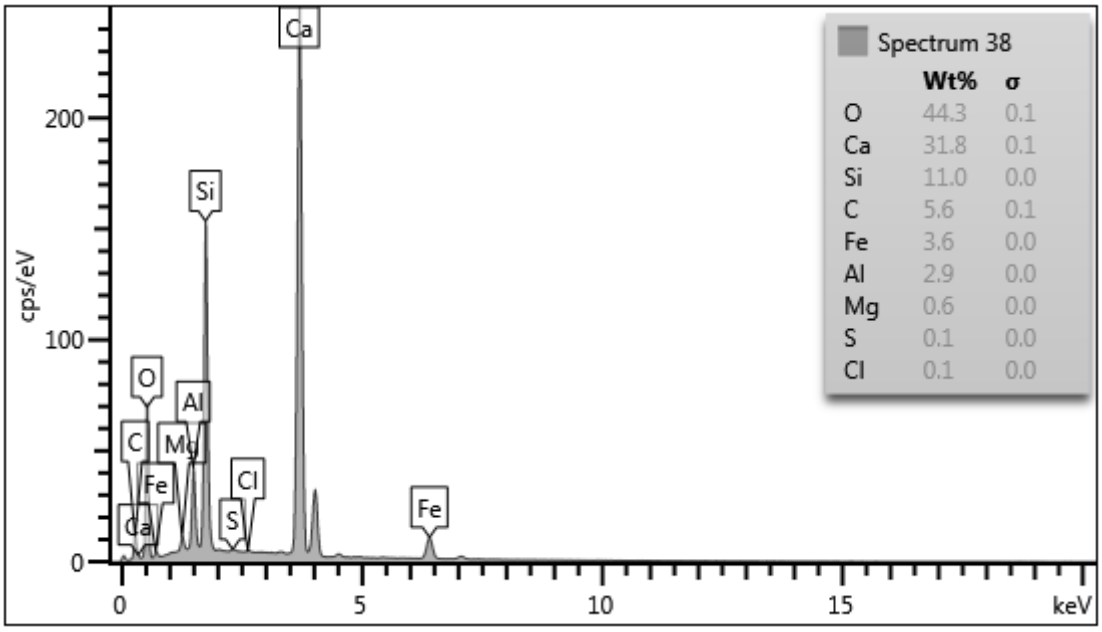
Spectrum 10 (Clay in Binder Phase)



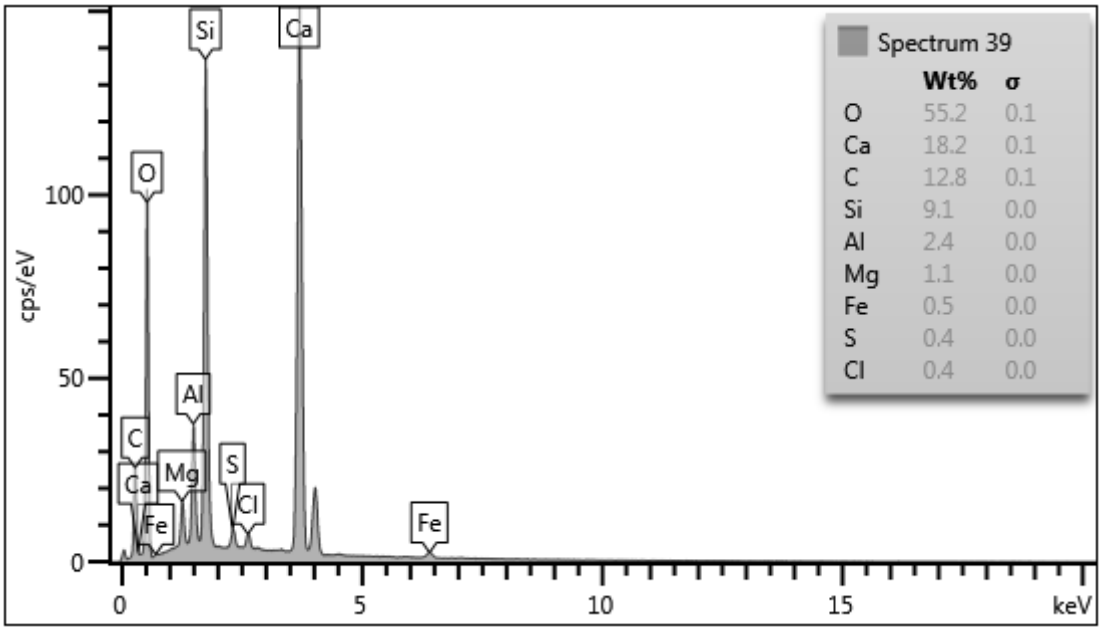
Greene 2 – Sand (Quartz) and Binder (dark and white phases, Spectra 39 and 40) with Pores (Black)



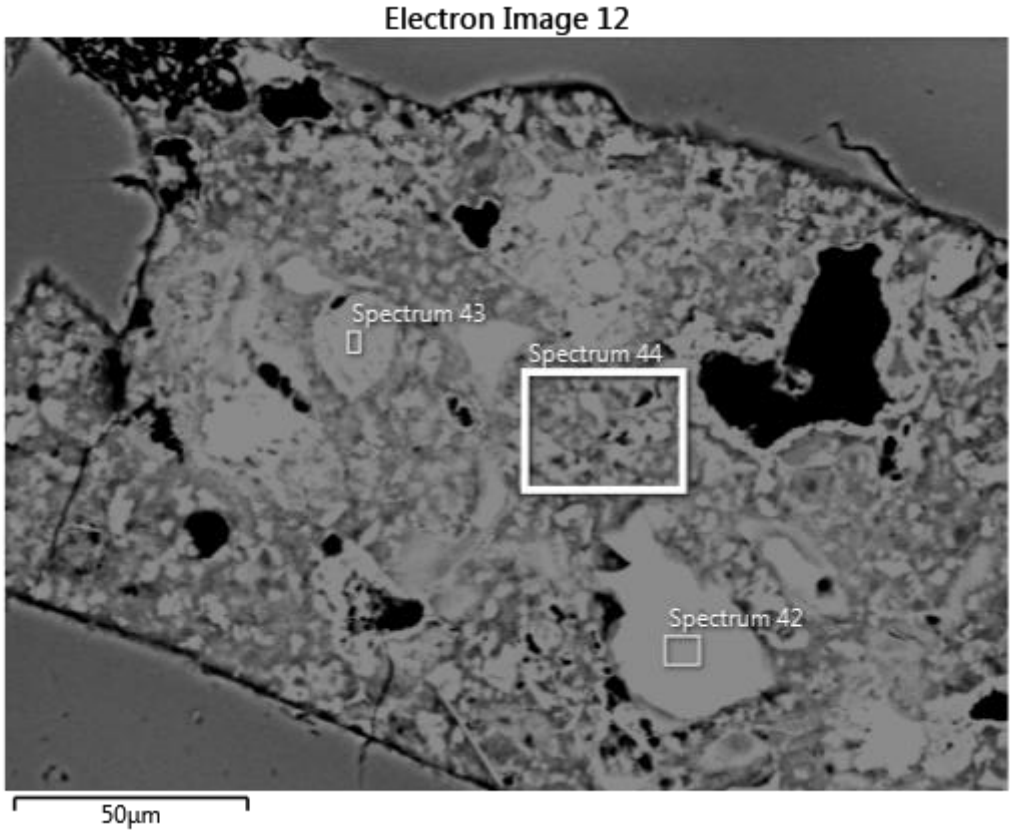

Spectrum 38 (Clay Phase, Appears white due to iron content, surrounded by Lime Rich Binder)



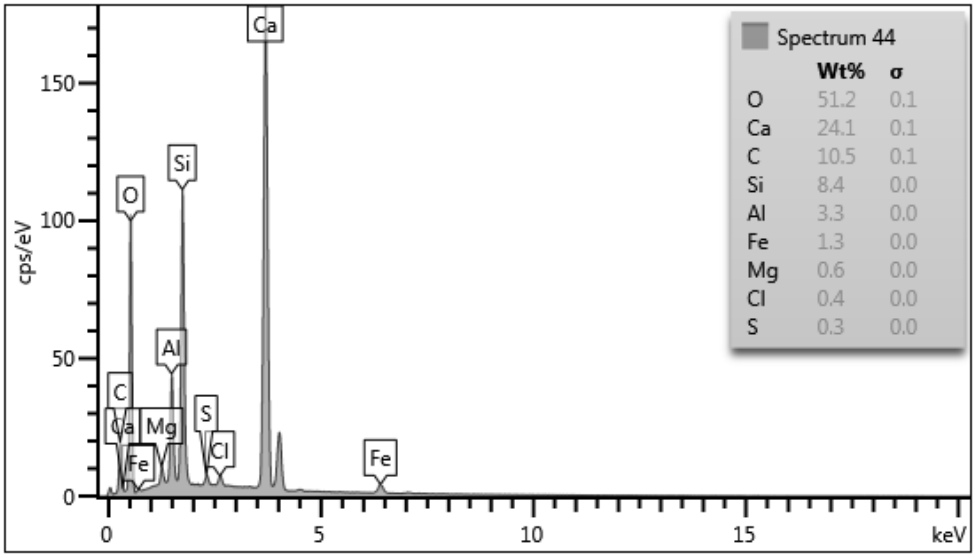
Spectrum 39 (Lime Rich Area in Binder Phase)



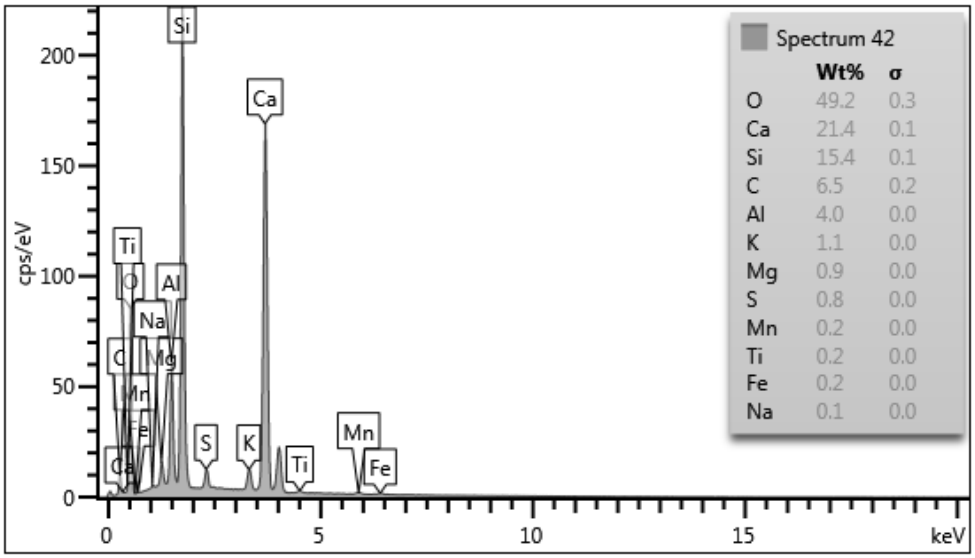

Higher Magnification – Greene 2



Spectrum 44 (Lime Rich Area in Binder)




Spectrum 42 (Clay in Binder)




Key Observations:

- The SEM/EDAX examination identified shale clay as a constituent of the binder phase. These relics appear as "white" in the SEM in backscattered electron image mode due to their iron content, but they are opaque or black when observed by petrography (in transmitted light microscopy).
- The reader is cautioned that polishing to create microscopic sections can "smear" constituents over one another affecting the EDAX results for chemical analysis. In practical terms, the analysis of the lime rich areas of the binder may reflect aluminum content from the clay, etc.

## About the Author

Denis A. Brosnan is the Bishop Chair in Materials Science and Engineering at Clemson University. He specializes in forensic analysis of ceramic materials. For the last fifteen years, he has concentrated on forensics of building materials with important projects at the Smithsonian Institution, numerous buildings on the National Register, historic fortifications at National Parks including Fort Sumter National Monument, and historic buildings in Charleston, SC.

He is proud to be the father of two graduates of the University of South Carolina, and he considers it a particular honor to work on the Historic Wall at the Horseshoe.

Contact Dr. Brosnan via bdenis@clemson.edu or 864-506-3041 (cell) or:
6277-600 Carolina Commons Drive, PMB 330
Fort Mill, SC 29707

# Engineering Assessment of Bricks
# Historic Campus Wall
# University of South Carolina

by
Denis A. Brosnan, Ph.D., P.E.
July 7, 2014

## Executive Summary

Specimens of clay bricks from the Historic Wall completed in 1836 were characterized as to their engineering properties that relate to contemporary Standards for brick products. The purpose was development of information for use in specifications for repair material and to guide restoration activities. These bricks were obtained from cataloged achieve specimens held at USC in late 2010.

The bricks were found to be hand molded and produced from weathered shale clay as is found in the Columbia S.C. area[1]. The bricks were found to exhibit saturation coefficients and pore structures that would classify them as Grade SW (Severe Weathering) in contemporary Standards, and replacement bricks meeting Grade SW are strongly recommended. The test results are consistent with the observation of only a few freezing and thawing durability failures or "spalls" on the Wall. Additional brick attributes for repair include use of similar brick sizes, colors, thermal expansion, and surface features as in original construction. Mortar color matching and joint tooling are important in repairs so as to match the aesthetics of the original structure.

## Introduction

Four structural clay brick specimens from original construction of the Horseshoe Wall, located in historical archives, were tested for absorption properties according to the method in ASTM C67, *Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile*. These specimens were also tested using Mercury Intrusion Porosimetry (MIP) to further establish their contemporary Grade rating, and they were tested using thermal expansion by dilatometry in order to estimate their firing temperatures.

The purpose of this report is to provide supplemental information for the current preservation activities with the Wall. Bricks meeting ASTM C 216 Grade SW (Severe Weathering) in restoration work were recently recommended[2]. The specimens were tested in the Bishop Materials Laboratory of Clemson University under the certifications attained by that organization relative to the tests.

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[1] The source of bricks was primarily from the John Brown brickyard located by the Congaree River in Columbia, but some bricks were obtained from Charleston, SC. See "University of South Carolina Campus Wall Historic Structure Survey, E. Oswald, J. Betsworth, and J. Zeise, A Report Prepared for Dr. Robert Weyeneth, Spring (2011).

[2] Characterization of Masonry Mortar, Historic Campus Wall, University of South Carolina, Denis A. Brosnan, Ph.D., P.E., July 2, 2014.

Bricks are fundamentally classified under ASTM C 216 by their water absorption characteristics and their compressive strength. The absorption characteristics reflect the pore structure that essentially determines the ability of the bricks to resist the forces involved in freezing and thawing of water saturated bricks. Therefore, much attention in this report is paid to properties that reflect pore structure in characterization of historic bricks.

The qualification of structural clay units in resisting freezing and thawing cycles is judged by comparing water absorption characteristics with criteria in contemporary Standards[3], with tests conducted using the methods in ASTM C 67. While contemporary Standards do not apply to bricks in older masonry structures, the criteria in the Standards represent years of accumulated knowledge on brick masonry and are used in making an engineering estimate of brick performance. To further consider the qualification of the bricks, the pore size and pore volume criteria developed by Maage are employed[4]. Finally, the firing temperature of the bricks was determined using thermal dilatometry[5].

Findings

Photographs of three of the as-received bricks are shown in the Appendix. All appear to be molded bricks based on the weathered shale commonly found in the Columbia area. The three brick were all red to red-yellow in color with typical "porous texture" for molded bricks as shown on fracture surfaces on the as-received photographs.

The absorption properties of the bricks are given in Table 1. The properties are briefly explained as follows:

*Cold Water Absorption* (CWA) – the weight gain of a dried brick or tile expressed as a percentage increase from the dry weight after immersion in room temperature water for 24-hours. Such treatment typically fills or saturates about 66-68% of the open porosity of the brick.

*Boiling Water Absorption* (BWA) – the weight gain of a dried brick or tile expressed as a percentage increase from the dry weight after immersion in boiling water for five hours. Such treatment typically fills or saturates over 96% of the open porosity of the brick.

*Saturation Coefficient* – the quotient of CWA divided by BWA expressed as a fraction. This quantity reflects the fraction of "fine pores" within the brick or tile. Contemporary Standards set a maximum of saturation coefficient was a means of discriminating durable and non-durable bricks.

---

[3] ASTM C216, Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale), The American Society for Testing and Materials. ASTM C212, Standard Specification for Structural Clay Facing Tile, The American Society for Testing and Materials

[4] Manfred Maage, *Frost Resistance and Pore Size Distribution of Bricks*, Ziegelindustrie International, 9 (1990) 472-481.

[5] L. Franke and I. Schumann, *Subsequent Determination of the Firing Temperature of Historic Bricks*, Conservation of Historic Brick Structures, Donhead Publishing, ISBN 1 873394 34 9 (1998).

For example, a brick classed as SW (Severe Weathering) in ASTM C216 cannot exceed a saturation coefficient of 0.80 (or 0.78 as an average in a group of five bricks).

The mercury porosimetry results are also given in Table 1. The Maage Index estimates the durability of fired clay bricks based on the total porosity and the fraction (content) of pores greater than three microns in diameter. The Maage Index rating is as follows:

| Maage Index | Rating |
|---|---|
| >70 | Frost resistant at normal saturation. |
| 55-70 | Unpredictable performance at normal saturation. |
| <55 | Not frost resistant at normal saturation. |

The results in Table 1 show all historic bricks to meet the saturation coefficient criteria for Grade SW (Severe Weathering) bricks as provided in contemporary Standard C216. Three of four bricks tested failed to meet the boiling water absorption maximum values for Grade SW bricks, and this is not surprising for bricks that were hand molded in the early 1800's. All of the bricks tested were rated as "durable" by the Maage criteria. These findings are consistent with the observation that there were only a few durability failures on the Wall.

The coefficient of thermal expansion in the interval room temperature to 200°C for three of the specimens were in the approximate range 5.6-5.8 exp (-6)/°C, a normal value range for clay bricks (Table 2)[6]. It is unlikely that sand was added to the local clay for making the bricks using the Columbia weathered shale (sand would increase the thermal expansion coefficient of fired bricks). Note that general matching of the thermal expansion coefficient between new and original bricks is recommended for repairs in historic structures.

Color data is given in Table 3, and it may be compared to as-received photographs of three of the four bricks. Brick 37E exhibits the largest yellow hue (highest b* value), consistent with the fact that this brick exhibits the lowest predicted firing temperature (Table 4). It is noted that brick 37E was previously classed as durable by the absorption and Maage methods despite a "lower" firing temperature.

The firing temperatures of the bricks (Table 4) were estimated using thermal dilatometry to be in the range 1076-1098°C (1969-2008°F). The individual dilatometry curves are given in the Appendix. For comparison purposes, modern facing bricks manufactured in Columbia classed as severe weathering and based on weathered shale are typically exposed to temperatures of about1093°C (2000°F). The values of the historic bricks allow them to be considered as "normally fired" for estimation of their Grade qualification.

[6] The normal range for thermal expansion coefficient for clay bricks is 3.4 – 8.0 exp (-6)/°C per M. Kornmann, Clay Bricks and Rooftiles, Societe de l'industrie minerale, Paris (2007).

Table 1: Standards, Absorption Properties, and Maage Index

| Category and Specimen ID | Cold Water Absorption, % (CWA) | Boiling Water Absorption, % (BWA) | Saturation Coefficient (CWA/BWA) | Apparent Porosity. % | Maage Index | Durability Prediction at Normal Saturation |
|---|---|---|---|---|---|---|
| Limit for SW bricks (average) | | ≤17.0 | ≤0.78 | Not specified. | | |
| Limit for SW bricks (individual) | | ≤20.0 | ≤0.80 | Not specified. | | |
| Limit for MW bricks (average) | | ≤22.0 | ≤0.88 | Not specified. | | |
| Limit for MW bricks (individual) | | ≤25.0 | ≤0.90 | Not specified. | | |
| 4W | 6.88 | 11.66 | 0.59 | 23.55 | 138.0 | Pass SW CWA/BWA Meets SW by CWA Pass Maage |
| 30W | 17.37 | 22.00 | 0.79 | 36.96 | 213.6 | Pass SW CWA/BWA Meets MW by CWA Pass Maage |
| 34E | 15.18 | 20.26 | 0.75 | 35.44 | 205.5 | Pass SW CWA/BWA Meets MW by CWA Pass Maage |
| 37E | 17.52 | 22.09 | 0.79 | 37.60 | 75.3 | Pass SW CWA/BWA Meets MW by CWA Pass Maage |

Table 2: Coefficient of Thermal Expansion by Thermal Dilatometry

| Specimen | Value, / ºC | Comment |
|---|---|---|
| 4W | 5.59exp(-6) | Normal value for clay brick. |
| 30W | 5.8exp(-6) | Normal value for clay brick. |
| 34E | 5.69exp(-6) | Normal value for clay brick. |
| 37E | 1.79exp(-6) | Instrument fault at low temperature influenced result. |

Table 3: Color Measurement in the L*a*b* System of Measurement

| Specimen | L*<br>(+L indicates lightness) | a*<br>(+a indicates red) | b*<br>(+b indicates yellow) |
|---|---|---|---|
| 4W | 42.7 | 14.8 | 17.3 |
| 30W | 45.4 | 17.5 | 24.1 |
| 34E | 41.4 | 13.6 | 16.9 |
| 37E | 55.7 | 16.7 | 27.7 |

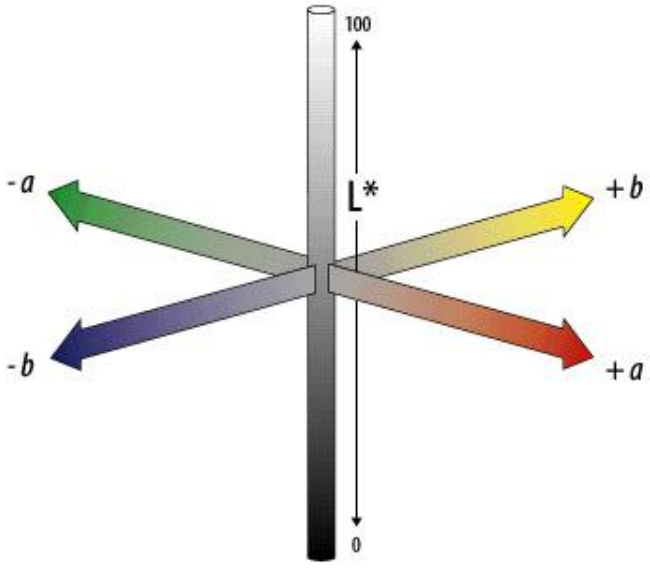



Figure 1: L*a*b* Coordinate System

Table 4: Estimated Firing Temperatures by Deflection in Thermal Dilatometry

| Specimen | Value, $^{o}$C |
|---|---|
| 4W | 1097.6 |
| 30W | 1085.8 |
| 34E | 1088.1 |
| 37E | 1076.0 |

Conclusions

The absorption and mercury porosimetry indices show all brick tested to be predicted as durable in agreement with practical observations of bricks in the Historic Wall. This supports the recommendation of use of Grade SW bricks for restoration repairs. Other criteria for replacement bricks include:

- Use of replacement molded bricks of the same size as the historic units.
- Color matching of replacement bricks to those bricks in the existing wall with similar surface features to include a smooth texture.
- Use of replacement molded bricks of similar thermal expansion coefficient as those in the historic wall.

While compressive strength was not obtained in this assessment, the bricks in the Wall appear sound and have obviously performed well.

With regards,

Denis A. Brosnan, Professor and Consultant
Registered Professional Engineer
SC Registration 13888

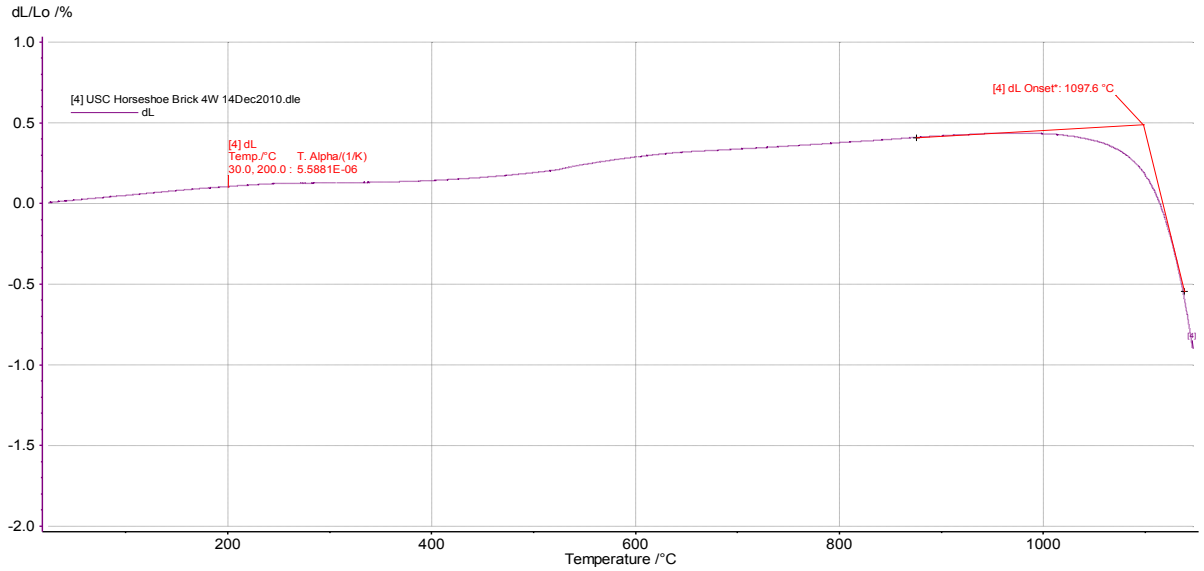
Appendix: Photographs and Additional Data

As-Received Photographs – No Brightness or Contrast Adjustment
No photograph available for Specimen 4W

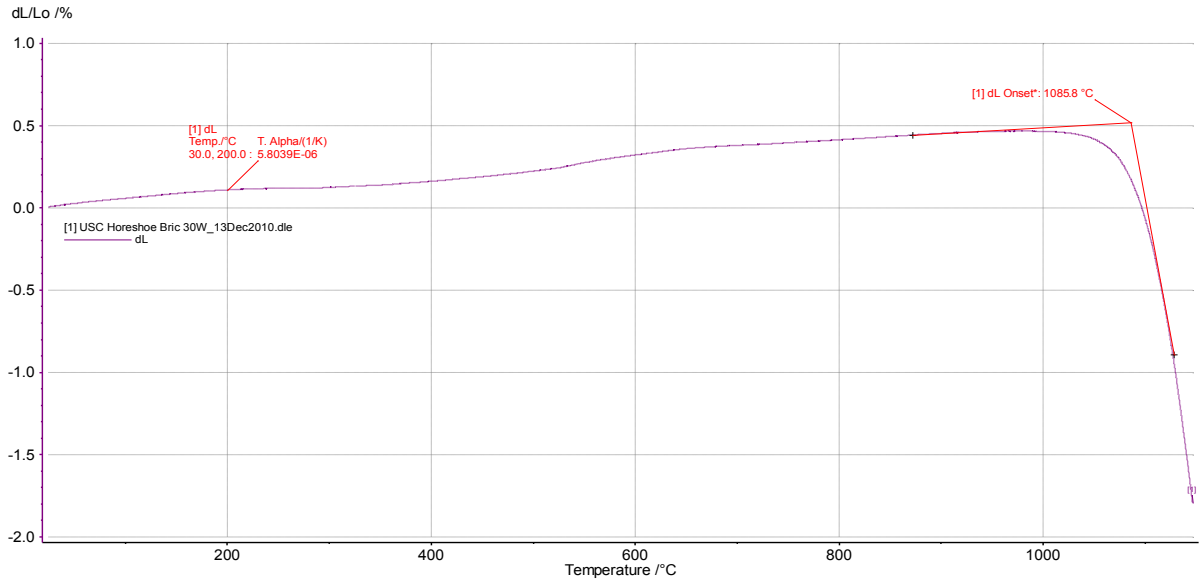

USC Confederate Wall 34E


USC Confederate Wall 37E

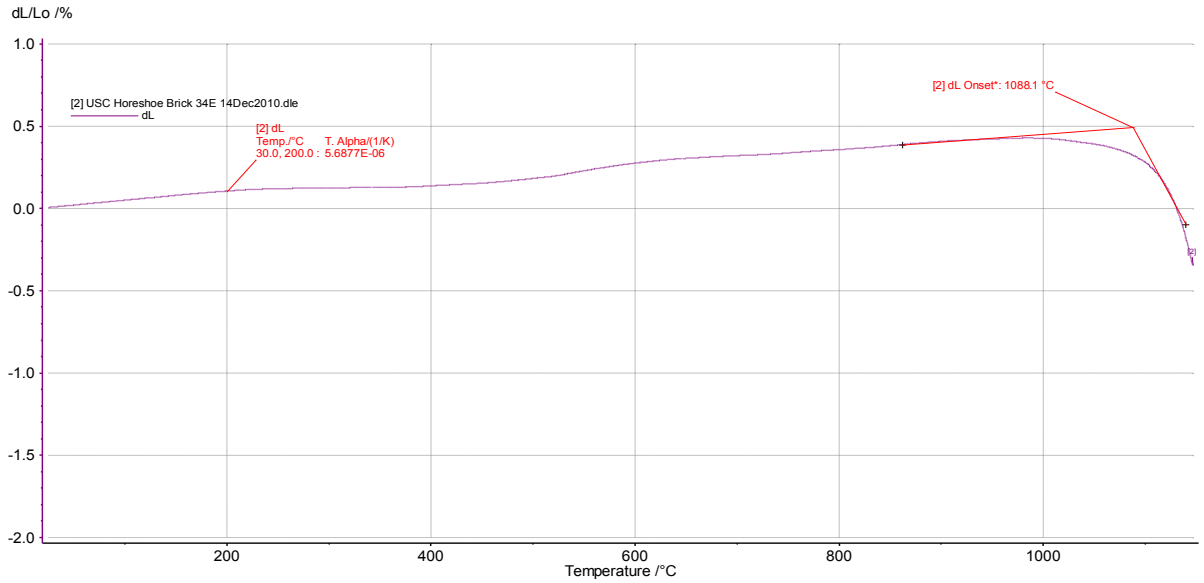
## Thermal Expansion Curve – Brick 4W




## Thermal Expansion Curve – Brick 30W



## Thermal Expansion Curve – Brick 34E




## Thermal Expansion Curve – Brick 37E